SYSTEMS ANALYSIS and DESIGN

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THE PROBLEM

We live in a country where a delicious and carefully prepared meal is one of the oldest and most essential parts of our culture. It is not only about the food itself; it is also about who we eat with, where we eat, what we talk about at the table, and the memories we share.

However, today we often face many problems that can ruin our mood even before we sit at the table. Not being able to find a place at the restaurant we want to eat at, problems with reservations, forgotten bookings, or communication mistakes are some of the common issues. Transportation problems, uncertainty about valet or parking options, the need to call each restaurant one by one, or the difficulty for people who do not want to talk on the phone can also make the process stressful. Moreover, when we arrive at the restaurant, waiting a long time for our order or having confusion in table arrangements because of canceled reservations can spoil the experience for both customers and businesses.

In addition, last-minute cancellations or customers who do not show up cause serious time and income losses for restaurants. In some places, tables are mistakenly reserved for more than one person, creating confusion and dissatisfaction. On busy days, employees may have trouble managing both reservation requests and table arrangements. Especially in popular restaurants, disorganized waiting lists can make customers wait for a long time at the door. Also, not being able to get up-to-date information about the restaurant's service status, menu options, or occupancy rate can waste time. All these problems negatively affect both the customer's dining experience and the business's efficiency.

CORPORATE AND CULTURAL FEASIBILITY

Dining out has always been more than just eating in Türkiye — it is a deeply rooted cultural ritual. People meet at restaurants not only to enjoy good food but also to build memories, strengthen bonds, and celebrate moments together. However, in today's fast-paced world, problems such as reservation errors, parking uncertainty, or forgotten bookings often disrupt this shared experience.

Our system aims to protect and strengthen this cultural value by integrating modern digital tools with the traditional restaurant experience. This solution is designed to support both customers and businesses, minimizing human error, reducing operational chaos, and ensuring a smooth pre-dining and dining process.

Cultural and Corporate Integration Points

- Eliminating Human Error:

By automating the reservation, confirmation, and check-in process, common mistakes such as double bookings, lost reservations, or forgotten notes are minimized, ensuring a more reliable experience for both sides.

- Multi-Restaurant Network:

Instead of calling each restaurant separately, users can view and reserve tables at multiple restaurants from a single platform. This structure supports scalability and encourages collaboration between different venues.

- Parking and Valet Integration:

One of the biggest cultural pain points—parking—is addressed through direct integration with nearby parking facilities and valet services. Users can check availability in advance, making the process more stress-free.

- Maps & Navigation Support:

The application integrates with map and navigation systems, allowing users to easily locate the restaurant and parking areas, plan routes, and estimate arrival times. This improves punctuality and reduces congestion.

- Social Media and Chrome Extension:

By embedding the restaurants' social media profiles directly into the application, users can view menus, reviews, and updates without switching platforms. Additionally, a Chrome extension will allow quick reservations directly from browsers.

- Flexible and Inclusive User Experience:

The platform will include features suitable for individuals who prefer not to make phone calls. This aligns with modern communication preferences while also supporting traditional users through a clear, intuitive interface.

- Deposit System :

To prevent last-minute cancellations, a deposit mechanism will ensure restaurants are protected financially, while users remain committed to their reservations.

- Smart Notification and Check-In System:

Users will receive three check-in reminders during the 30-minute period before their reservation time (start–middle–end), reducing no-shows. Additionally, an optional reminder 1 day before will allow flexible cancellation or confirmation.

- Group Order Optimization:

For large groups, the system offers early order-taking features. This enables restaurants to start preparing meals before the guests arrive, improving service speed and customer satisfaction.

- Operational Staff Efficiency:

By automating communication and reservation steps, restaurant staff can focus on service quality rather than administrative tasks. This reduces workload, confusion, and stress during busy hours.

Cultural Continuity and Business Sustainability:

The application is not intended to replace the cultural act of dining, but to enhance it. By aligning with the social habits of Turkish dining culture, it enables families, friends, and colleagues to focus on the shared experience rather than logistical problems.

From the business perspective, it supports operational efficiency, cost savings, and customer satisfaction. Restaurants can better manage table occupancy, parking, staff allocation, and order timing — all while maintaining their brand identity and customer loyalty.

In conclusion, this system strengthens both cultural and corporate dimensions of the dining experience: it simplifies processes, minimizes errors, enhances communication, and preserves the emotional value of sharing a meal.

TECHNOLOGICAL FEASIBILITY

With the establishment of a centralized and technology-driven restaurant reservation system, the entire dining preparation process will be streamlined and digitalized. Through real-time integrations, automated workflows, and smart notification mechanisms, both customers and businesses will benefit from a more reliable, efficient, and personalized experience.

The technological backbone of the system will focus on eliminating human error, increasing automation, enabling instant communication, and integrating multiple services into one seamless platform.

Core Technological Components and Functions

- Automation and Error Minimization:

Reservation, check-in, parking allocation, and cancellation processes will be automated to reduce manual data entry, double bookings, and forgotten reservations. The system will rely on structured workflows and secure data storage to ensure error-free operation.

- Parking and Valet Integration:

Real-time integration with nearby parking areas and valet services will allow users to see parking availability before arriving. This will be supported by live navigation data, ensuring accurate and updated information.

- Maps and Navigation System:

The application will be fully integrated with map services, enabling users to get real-time directions, estimated travel time, and parking guidance. Navigation will also factor in peak hour traffic data to support punctual arrivals.

- Application Infrastructure:

The core system will operate through a mobile and web-based application, built with scalable architecture to handle high traffic during peak hours. Cloud-based data storage will ensure real-time synchronization between users and restaurants.

- Social Media Integration:

Restaurants' social media accounts (Instagram, Facebook, TikTok, etc.) will be embedded directly into the application. This will enable users to explore menus, promotions, and visuals without leaving the platform.

- Chrome Extension Integration:

A browser extension will allow users to make one-click reservations directly from restaurant websites or search results, further simplifying the booking process.

- Multi-Restaurant Structure:

The platform will support multiple restaurants in different locations. All participating restaurants will be managed from a centralized database that tracks table availability, capacity, and real-time status.

- Deposit and Payment System:

A secure online payment gateway will allow deposits to be taken at the time of booking. This will protect restaurants from no-shows and ensure customers commit to their reservations.

- Smart Check-In and Notification System:

A structured reminder mechanism will send three notifications during the 30-minute check-in period (beginning–middle–end) and an optional reminder 24 hours before the reservation. This will drastically reduce no-shows and late arrivals.

- Large Group Order Preparation:

For big reservations, the system will allow customers to pre-order meals in advance, so kitchens can prepare early. This reduces waiting time and increases table turnover efficiency.

- Staff Dashboard and Operational Tools:

Restaurant staff will have access to an interactive admin panel where they can track reservations, assign tables, manage waitlists, monitor parking availability, and receive instant alerts for changes. This will reduce operational confusion during busy hours.

Technical Infrastructure and Maintenance

1. The application will be developed using modern frameworks supporting API-based integrations, ensuring compatibility with external systems such as payment gateways, map services, and parking databases.
2. Real-time notifications will be supported through push technology, SMS, and email systems to ensure every user receives timely updates.
3. Security protocols such as data encryption, two-factor authentication, and GDPR-compatible privacy standards will be applied to protect user data.
4. The system's technological lifespan will be at least 3 years, with upgrade support and scalability options planned for up to 5 years.
5. Technical staff will include software developers, backend administrators, network managers, and integration engineers, ensuring high system availability and rapid troubleshooting.

Integration and Adaptability

The technological structure of the system is designed to adapt to both individual users and complex restaurant operations. By combining reservation, navigation, parking, communication, and payment systems into a single platform, the application provides a holistic and future-proof technological ecosystem.

This infrastructure ensures:

Real-time operational efficiency,

Better customer experience,

Lower operational costs,

And long-term sustainability for participating restaurants.

LEGAL FEASIBILITY

As the proposed restaurant reservation and management system will operate as a digital platform that processes personal data, payment information, location data, and reservation records, the legal infrastructure must be clearly defined and fully compliant with national and international regulations.

This platform is not only a technological solution but also a data-sensitive service that requires careful handling of user privacy, financial transactions, third-party integrations, and platform security. Therefore, the legal structure must ensure compliance with both Turkish legislation and international data protection standards.

Legal Compliance Framework

- Personal Data Protection:

The system will collect and process personal data (name, contact information, reservation time, location information, and payment details). Therefore, it must comply with the Law on the Protection of Personal Data No. 6698 (KVKK). User data will only be

collected with explicit consent, stored securely, and not shared with third parties without legal basis.

- European Data Protection Law (EDPL) Alignment:

In line with international standards such as the EDPL and GDPR principles, policies regarding data protection, open data use, civil liberties, and cross-border data transfer will be clearly defined. Administrative and technical measures will be taken to protect personal information stored on servers and databases against any data security threats.

- E-Payment and Financial Regulation Compliance:

The deposit (kapora) and payment system integrated into the platform must comply with Banking Regulation and Supervision Agency (BDDK) and Payment Systems Law No. 6493. Only licensed payment infrastructures will be used, and transaction records will be stored in compliance with financial reporting and auditing requirements.

- Location and Parking Services Legal Use:

Integration with parking and valet services must respect transportation and public space regulations. Shared location information will be used only for navigation and service facilitation, not for marketing or third-party distribution without consent.

- Third-Party Integration & Social Media:

Social media and Chrome extension integrations will be legally bound by platform usage agreements (API policies) and intellectual property rights. Restaurants' content will be published with their authorization, and the platform will not store or distribute copyrighted content without permission.

- Notification and Communication Regulation:

SMS, email, and in-app reminder notifications must comply with the Electronic Communications Law and Commercial Communication Regulation. Users will be able to opt in or out of notifications, and every communication will require prior consent in accordance with anti-spam policies.

- Multi-Restaurant Platform & Liability:

The legal framework will clearly define the responsibilities of the platform operator, restaurant partners, and users. In cases of last-minute cancellations, disputes, or reservation errors, terms of service and liability clauses will ensure legal clarity for all parties.

- Employment and Operational Regulations:

For restaurants using the platform, staff responsibilities and legal compliance with labor laws will remain under the employer's liability. The platform will act as a service intermediary, not as an employer.

Legal Infrastructure and Documentation

1. Terms of Use & Privacy Policy documents will be mandatory for every user before registration.
2. All restaurants participating in the platform will sign service contracts and data processing agreements outlining their legal responsibilities.
3. The platform will maintain data processing logs, transaction records, and communication history to comply with inspection and legal investigation procedures if required.
4. Server infrastructures will comply with KVKK and GDPR-compliant storage standards, and security audits will be conducted periodically.
5. Consent mechanisms will be transparent and verifiable to meet legal standards for digital services.

In conclusion, this system will be designed to fully comply with personal data protection, payment regulations, communication laws, and liability frameworks. Legal clarity and compliance will not only protect users but also build trust and reliability for restaurants and other service partners, ensuring the platform's long-term sustainability and operational security.

1. Project Manager- Ali Osman ŞİMŞEK

Our Project Manager oversees the entire operation — from idea to launch. They coordinate timelines, assign tasks, and make sure every component of the project flows seamlessly. Acting as the bridge between all departments, the Project Manager ensures that developers, designers, and analysts work in perfect harmony to deliver a reliable and user-friendly reservation platform.

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2. Software Engineer / Full-Stack Developer- Nisanur Kurt

The Full-Stack Developer is responsible for building both the **front-end and back-end** of our application. They ensure that every user interaction — from booking a table to checking parking availability — is powered by a smooth, fast, and secure technical

foundation. By managing **API integrations**, **database connections**, and **real-time updates**, they make our system efficient and scalable.

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3. Business Analyst- Süeda DEMİRÖZ

Our Business Analyst studies the restaurant industry, user behavior, and revenue opportunities to shape our business model. They define the **deposit (kapora)** system to reduce no-shows, analyze customer satisfaction trends, and design cooperation frameworks with partner restaurants. Their insights ensure our platform remains both profitable and customer-centric.

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4. Database Designer & Administrator- Taha Can TÜZÜNLER

This role combines the precision of design with the discipline of administration. The Database Designer creates the data architecture that links restaurants, reservations, users, payments, and parking lots. As the Administrator, they manage data storage, backups, and performance optimization — guaranteeing that every transaction and update runs smoothly and securely

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5. System Analyst

The System Analyst ensures that the project's technical structure aligns with its business goals. They map out how different systems — such as **reservation management**, **parking integration**, **notification scheduling**, and **payment modules** — communicate with each other. By defining data flow and system requirements, they make sure the whole ecosystem runs flawlessly.

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6. Mobile App Developer

Our Mobile App Developer brings our vision directly to users' hands. They develop native **iOS and Android** applications that make table reservations, parking guidance, and real-time notifications accessible anytime, anywhere. From the **check-in process** to **reminder notifications**, every tap in the app is crafted for simplicity and reliability.

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7. Cyber Security Specialist

Protecting user data is at the heart of our mission. The Cyber Security Specialist safeguards all information — from **personal details** and **payment records** to **location data**. They enforce **KVKK/GDPR compliance**, implement encryption systems, and constantly monitor for potential threats, ensuring that both customers and restaurants operate in a trusted environment.

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8. Graphic Designer

The Graphic Designer gives life to our platform's visual identity. They design the color palette, icons, and layouts that reflect a modern yet warm dining experience. Their work shapes the interface for restaurant profiles, parking visuals, and social-media integration — ensuring that users feel both comfort and trust while using our app.

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9. QA Tester / Quality Assurance Engineer – The Perfection Seeker

Before our product reaches users, the QA Tester puts every feature through rigorous testing. They check for bugs, performance issues, and user-experience flaws in every module — from login to navigation to notifications. Their mission is simple: ensure that every version of the app delivers a **flawless and enjoyable experience** for both customers and restaurants.

Together as One Team

Each of our team members contributes their expertise to build a **smart, secure, and culturally aligned reservation ecosystem**.
From code to design, from user trust to business insight — this team is united by a shared goal:

To make dining experiences effortless, connected, and memorable.

FINANCIAL FEASIBILITY

Year	Benefits	Discount Factor	PV Benefits	Development Cost	Operating Cost	PV Operating Cost	Net Present Value
0	0	1	0	53065000	0	0	-53065000
1	5000000	0,9091	4545500	0	1000000	909100	3636400
2	6250000	0,8264	5165000	0	1070000	884248	4280752
3	7500000	0,7513	5634750	0	1140000	856482	4778268
4	8750000	0,683	5976250	0	1210000	826430	5149820
5	10000000	0,6209	6209000	0	1280000	794752	5414248

Wages Cost

Department	Personal	Duration (Months)	Salary (₺)	Total (₺)
Project Manager	1	12	90000	1080000
System Analyst	2	12	75000	1800000
Database Designer	1	12	80000	960000
Software Engineer	2	12	85000	2040000
Mobile Developer	1	12	85000	1020000
Graphic Designer	1	12	50000	600000
Business Analyst	1	12	70000	840000
Cyber Security	1	12	90000	1080000
QA Tester	1	12	65000	780000
Assistant PM	1	12	45000	540000
TOTAL	**12**			**10740000**

License Cost

Category	Item / Technology	Description / Usage	Estimated Cost (TL)
Location Services	Google Maps Platform	Unified Integration: Includes Maps SDK, Places API, Geocoding, and Directions API for location services.	50.000 TL (One Time)
Mobile Development	Dart (Flutter) OR JavaScript (React Native)	Primary Language: Required to build the mobile application for both iOS and Android simultaneously.	Free (Open Source)
Backend Development	Node.js (TypeScript) OR Python	Server Language: Required to manage logic, API connections, and reservation algorithms.	Free (Open Source)
Database	SQL (PostgreSQL) OR NoSQL (MongoDB)	Query Language: Required to store user data, reservations, and restaurant info.	Free (Open Source)
Web Admin Panel	HTML / CSS / JavaScript	Web Technologies: Required to build the dashboard for restaurant owners to manage bookings.	Free (Open Source)
App Store License	Apple Developer Program	License fee to publish the app on the Apple App Store (iOS).	90.000 (One Time)
App Store License	Google Play Console	License fee to publish the app on the Google Play Store (Android).	50.000 (One Time)
Infrastructure	Cloud Server Hosting	Hosting costs for Backend and Database (e.g., AWS, DigitalOcean, Google Cloud).	5.000x12=60.000 TL for a year
			TOTAL= 250.000 TL

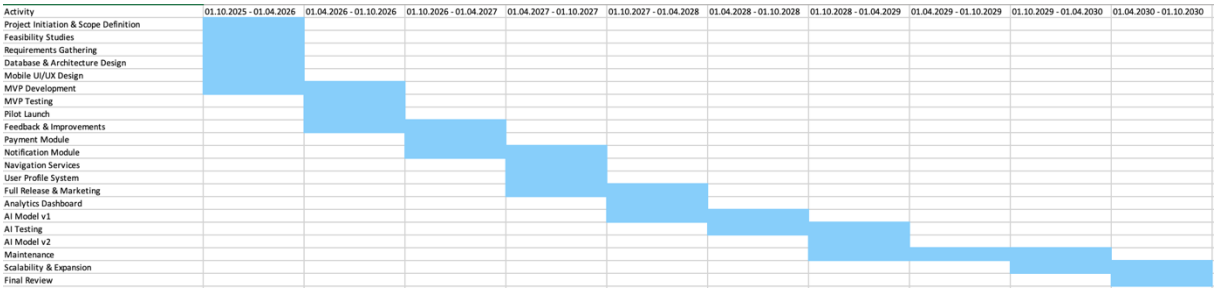
Development Cost

Costs	Unit (TL)	Comment
Wages / Salaries	₺10.740.000,00	Developer, designer, analyst, PM team salaries (1 Year)
Hardware	₺1.515.000,00	Computers, servers, networking, and testing devices
Licenses & Software Tools	₺250.000,00	Software, frameworks, API licenses (Google Maps, etc.)
Education / Training	₺150.000,00	Staff training for system operation and security
Marketing & Branding	₺500.000,00	Logo design, social media launch, promotional campaigns
Cloud Hosting & Server Costs	₺350.000,00	Cloud database (AWS/Azure), hosting, backups
Graphic Designer Expenses	₺100.000,00	Stock assets, prototypes, user testing sessions
Cyber Security & Data Protection	₺200.000,00	SSL certificates, penetration testing, compliance
Parking/Navigation API Integration	₺250.000,00	Integration with Maps and parking databases
TOTAL	**₺14.055.000,00**	**Estimated total project development cost**

Hardware Cost

Item	Unit	Price Per Unit	Total
Computer	16	₺ 60.000,00	₺ 960.000,00
Printer	4	₺ 20.000,00	₺ 80.000,00
Generator	2	₺ 50.000,00	₺ 100.000,00
Router	5	₺ 15.000,00	₺ 75.000,00
Server	1	₺ 300.000,00	₺ 300.000,00
TOTAL	-	-	**₺ 1.515.000,00**

Gannt Chart



Pert

Code	Activity	Predecessors	Duration (6-Month Periods)
A	Project Initiation & Scope Definition	-	0,1
B	Feasibility Studies	A	0,3
C	Requirements Gathering	B	0,2
D	Database & Architecture Design	C	0,2
E	Mobile UI/UX Design	C	0,2
F	MVP Development	D,E	1
G	MVP Testing	F	0,5
H	Pilot Launch	G	0,2
I	Feedback & Improvements	H	0,5
J	Payment Module	I	0,5
K	Notification & Check-In Module	I	0,5
L	Navigation & Location Module	I	0,5
M	User Profile System	I	0,5
N	Full Release & Marketing	J,K,L,M	0,5
O	Analytics Dashboard	N	0,3
P	AI Model v1	O	1
Q	AI Testing	P	0,5
R	AI Model v2	Q	0,7
S	Maintenance & Improvement	R	1,5
T	Scalability & Expansion	S	1
U	Final Review & Documentation	T	0,5

CPM Table

Activity	ES (Earliest Start)	EF (Earliest Finish)	LS (Latest Start)	LF (Latest Finish)	Slack
A	0	0,1	0	0,1	0
B	0,1	0,4	0,1	0,4	0
C	0,4	0,6	0,4	0,6	0
D	0,6	0,8	0,6	0,8	0
E	0,6	0,8	0,6	0,8	0
F	0,8	1,8	0,8	1,8	0
G	1,8	2,3	1,8	2,3	0
H	2,3	2,5	2,3	2,5	0
I	2,5	3	2,5	3	0
J	3	3,5	3	3,5	0
K	3	3,5	3	3,5	0
L	3	3,5	3	3,5	0
M	3	3,5	3	3,5	0
N	3,5	4	3,5	4	0
O	4	4,3	4	4,3	0
P	4,3	5,3	4,3	5,3	0
Q	5,3	5,8	5,3	5,8	0
R	5,8	6,5	5,8	6,5	0
S	6,5	8	6,5	8	0
T	8	9	8	9	0
U	9	9,5	9	9,5	0

ANALYSIS PHASE

SYSTEM REQUIREMENTS

FUNCTIONAL REQUIREMENTS:

• The system must allow users to view restaurants, check real-time table availability, and create reservations.
• Users log in with their phone number; a verification code sent to the device ensures secure authentication.
• If no table is available, the user is automatically added to the waiting list, and their position is updated in real time.
• Users can see their waiting list position, estimated waiting time, and receive notifications when their table is ready.
• The system provides table/time recommendations powered by AI.
• Restaurant staff must have access to a control panel to manage table statuses and reservations.
• The system must display parking and valet availability for users arriving by car.
• Users can view restaurants' social media posts directly within the application.
• During reservation creation, users can make a deposit (pre-payment), and the system sends confirmation once the transaction is successful.

TECHNICAL AND RESOURCE REQUIREMENTS:

• Mobile application developer (iOS/Android)
• UX–UI designer
• Backend developer (API and AI integration)
• AI/ML specialist (for prediction and recommendation algorithms)
• Cloud-based server infrastructure (AWS, Google Cloud, Azure, etc.)
• 50–100 Mbps internet connection for restaurant dashboards
• LAN/Wi-Fi supported POS integration
• Tablets or computers for restaurant staff
• QR code reader (optional for table check-in)
• Database administrator (PostgreSQL / Firebase)

PHYSICAL REQUIREMENTS:

• Tablets or computers placed in restaurants for reservation management
• Office or administrative workspace for system operations
• Secure cloud server access or dedicated server room
• Office desks, chairs, and stationery
• Optional signage or assistive displays for customers at restaurant entrances

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SYSTEM INTERFACE:

• Users log in using their phone number and verification code.
• After logging in, users can view menus, table availability, and reservation time slots.
• If placed on the waiting list, the system shows their position and real-time waiting time.
• Restaurant dashboard allows staff to update table status (occupied, free, being cleaned) and monitor reservations.
• Integrated navigation helps users find the restaurant easily.
• The interface displays social media content from restaurants (Instagram photos, videos, etc.).
• When a table becomes available, a notification pop-up allows the user to confirm within 5 minutes.

REQUIREMENTS FOR DATA:

• Real-time table availability must be updated based on restaurant panel inputs.
• Waiting list data should be processed dynamically and updated automatically.
• AI models must use historical reservation data to make predictions.
• Deposit/payment information must be stored securely and accessed only by authorized systems.
• User profile data must be kept in a centralized and protected database.

SECURITY:

• User identity is verified via OTP code during login.
• All reservation, payment, and personal data must be encrypted during transmission and storage.
• Restaurant staff can only access data related to their own restaurant (role-based authorization).
• AI and personal data processing must comply with KVKK/GDPR regulations.
• System logs should be reviewed regularly, and security audits must be conducted periodically.

USER AND HUMAN FACTOR:

• The interface is designed to be simple, modern, and easy to use for users of all ages.
• First-time users receive short introductory messages explaining key features.
• The application initially supports Turkish and English, with more languages added in future updates.
• Personalized recommendations are provided based on user preferences and reservation history.

• System notifications are designed to be clear, helpful, and user-friendly to improve overall experience.

SWOT ANALYSIS

Strengths

Strengths	Explanation
Real-time reservation & availability tracking	Users instantly see table availability and waiting list updates.
AI-powered predictions	System recommends optimal times, predicts waiting times and occupancy.
Integrated reminder & notification system	Reduces no-shows and improves reservation reliability.
Multi-restaurant scalability	Platform can expand to multiple restaurants easily.
User-friendly interface	Simple design accessible to users of all ages.
Social media integration	Restaurants can showcase images and videos directly inside the app.

Weaknesses

Weaknesses	Explanation
Requires constant real-time data from restaurants	If staff forget to update table status, system accuracy decreases.
High dependency on stable internet connection	Slow networks may disrupt updates and notifications.
Initial development cost may be high	AI integration, UX design, and cloud servers require investment.
Restaurants must adopt new technology	Some businesses may be reluctant or slow to adapt.

Weaknesses	Explanation
Users may resist creating accounts	Phone verification may feel tiring to some users.

Opportunities

Opportunities	Explanation
Growing demand for digital reservation systems	Post-pandemic consumer habits favor online booking.
Market expansion to cafés, bars, entertainment venues	Same model can be applied to many industries.
Partnerships with parking/valet services	Enhances user convenience and app value
Collaboration with influencers / restaurant pages	Increases visibility and user acquisition
Data-driven restaurant performance insights	Restaurants can optimize staff and table turnover

Threats

Threats	Explanation
Competitors offering similar apps	Market competition may reduce restaurant adoption.
Technical failures or downtime	System outages may damage brand trust.
Privacy concerns (data handling)	Users may distrust apps that track behavior or location.
Restaurant staff errors	Incorrect table updates can frustrate users.

Threats	Explanation
Regulatory issues (KVKK/GDPR)	Strict data protection laws require constant compliance.

GENERAL SURVEY ABOUT THE RESERVATION SYSTEM

1- How would you describe your general experience with restaurant reservations?

Excellent %22
Very good %19
Good %27
Not bad %21
Bad %11

2- Compared to one year ago, how has your reservation experience changed?

Much better %18
Slightly better %20
Same %34
Slightly worse %16
Much worse %12

3- Please indicate how correct or wrong the following statements are for you.

Statement	Definitely Correct	Generally Correct	Not Sure	Generally Wrong	Definitely Wrong
a) I often have trouble finding available tables at restaurants.	%31	%27	%10	%22	%10

Statement	Definitely Correct	Generally Correct	Not Sure	Generally Wrong	Definitely Wrong
b) I prefer using online systems instead of calling restaurants.	%29	%33	%14	%15	%9
c) Waiting time at restaurants is usually unpredictable for me.	%34	%26	%12	%18	%10
d) I feel more comfortable when the reservation process is automated.	%25	%37	%18	%12	%8

4- Do you have difficulty reaching restaurants during busy hours?

Definitely yes %19
Yes %28
Sometimes %30
No %15
Definitely no %8

5- Are you satisfied with the current reservation systems you use?

Definitely yes %17
Yes %29
Sometimes %31
No %15
Definitely no %8

6- Do you usually experience long waiting times when restaurants are full?

Definitely yes %24
Yes %33
Sometimes %20
No %14
Definitely no %9

7- Would you trust an AI-powered system that estimates waiting time and table availability?

Definitely yes %32
Yes %38
Sometimes %16
No %9
Definitely no %5

8- How do you rate your overall satisfaction with digital reservation and waiting list apps?

Excellent %21
Very good %18
Good %32
Not bad %20
Bad %9

9- Do you experience any difficulty while using reservation applications?

Definitely yes %7
Yes %11
Sometimes %24
No %36
Definitely no %22

10- How often do you need to wait for a table when going out to eat?

Always %11
Most of the time %28
Sometimes %38
Rarely %16
Never %7

11- How frequently do you make restaurant reservations online?

Always %14
Most of the time %31
Sometimes %22
Rarely %15
Never %18

12- Would you recommend a smart reservation & waiting list system to others?

Definitely yes %35
Yes %27
Sometimes %21
No %10
Definitely no %7

13- Would integrating parking/valet information be useful for you?

Definitely yes %29
Yes %41
Sometimes %14
No %11
Definitely no %5

14- How useful would real-time notifications (table ready, reminders) be for you?

Extremely useful %38
Very useful %32
Somewhat useful %17
Not very useful %8
Not useful at all %5

15- Do you believe an AI-based system could make the reservation process easier and faster?

Definitely yes %33
Yes %40
Sometimes %18
No %6
Definitely no %3

INTERVIEW QUESTIONS

1. Restaurant Manager

1. How do you currently manage reservations and waiting lists in your restaurant?
2. What major challenges do you face during peak hours?
3. Would an AI-supported prediction system (waiting time/crowd level) be useful for your operations?
4. What features would you consider essential in a digital reservation dashboard?

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2. Restaurant Staff (Host / Waiter)

1. What difficulties do you encounter when assigning tables during busy hours?
2. How do you currently communicate waiting time information to customers?
3. Would a real-time digital table status and waitlist screen make your work easier?
4. What functions do you think are necessary for an efficient staff interface?

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3. Customers (End Users)

1. How do you generally make restaurant reservations?
2. How important is real-time table availability and waiting time information for you?
3. Would you trust an AI-based system to suggest reservation times?

4. How do you feel about receiving multiple notifications (reminders, table ready alerts)?

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4. IT / System Administrator

1. What technical difficulties might arise when implementing a real-time reservation and waitlist system?
2. What security measures should be included to ensure safe user authentication?
3. Which technologies or infrastructures would be ideal for supporting AI prediction features?
4. What integrations (maps, payment, SMS) do you think are essential for system stability?

INTERVIEW ANSWERS

The interviews were conducted with a restaurant manager, a host from the restaurant staff, two frequent customers, and the IT specialist responsible for the technical infrastructure. After presenting our reservation and waiting list project, all interviewees expressed that the concept responds to long-standing challenges within restaurants and has strong potential to improve both customer satisfaction and operational efficiency.

The **restaurant manager** stated that the current reservation process is mostly handled through phone calls and manual note-taking, which often leads to confusion during peak hours. He emphasized that one of their biggest difficulties is the inability to provide accurate waiting times, causing customers to repeatedly ask for updates. He explained that an AI-supported waiting time estimation system would minimize these disruptions, allowing staff to focus on service quality. He also suggested that a digital dashboard containing real-time table status, cancellations, and waitlist information would significantly reduce the operational burden.

The **restaurant staff member** confirmed these challenges and added that misunderstandings are common during busy periods. Customers often receive inaccurate waiting time estimates simply because the staff cannot calculate them precisely in real time. She stated that a clear and easy-to-use digital interface showing table availability, cleaning status, and the order of the waiting list would greatly support their workflow. She highlighted that color-coded table indicators and quick-access

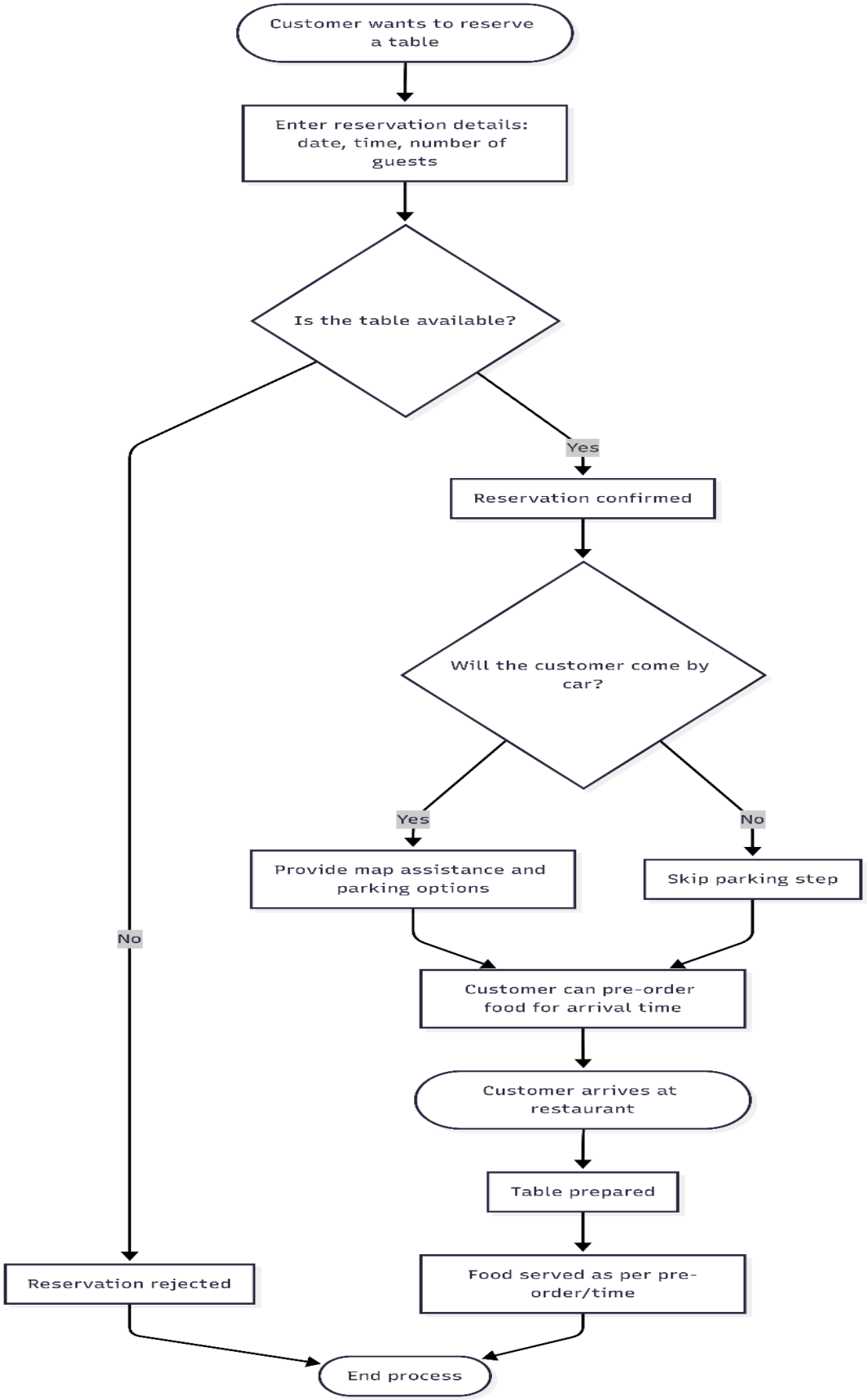
buttons for frequently used actions would improve efficiency and reduce stress on the team.

The **customers interviewed** expressed a strong interest in a system that provides transparent information without requiring them to call the restaurant. They stated that real-time table availability, accurate waiting time predictions, and timely notifications are the most valuable features for them. One customer mentioned avoiding popular restaurants due to uncertainty, saying that an AI-supported recommendation system would make them more comfortable choosing where and when to dine. Both customers noted that notifications such as reminders and “table ready” alerts would be extremely helpful as long as they are not excessive.

The **IT system administrator** explained that the main technical challenge lies in ensuring stable real-time communication between users, restaurant dashboards, and the central server. He stressed the importance of data encryption and two-factor authentication for secure user verification. He recommended cloud-based infrastructure to ensure scalability and reliability, emphasizing the necessity of strong API integrations for maps, payment processing, and SMS services. Regarding AI predictions, he stated that analyzing historical reservation patterns would be essential for producing accurate estimations of crowd levels and waiting times.

Overall, the interviews revealed a consistent need for a modern reservation and waiting list system. Stakeholders agreed that the proposed application would reduce staff workload, strengthen operational organization, increase customer satisfaction, and offer data-driven insights for smarter restaurant management.

Flow Chart


Customer wants to reserve a table
Enter reservation details: date, time, number of guests
Is the table available?
Yes
No
Reservation confirmed
Will the customer come by car?
Yes
No
Provide map assistance and parking options
Skip parking step
Customer can pre-order food for arrival time
Customer arrives at restaurant
Table prepared
Food served as per pre-order/time
Reservation rejected
End process

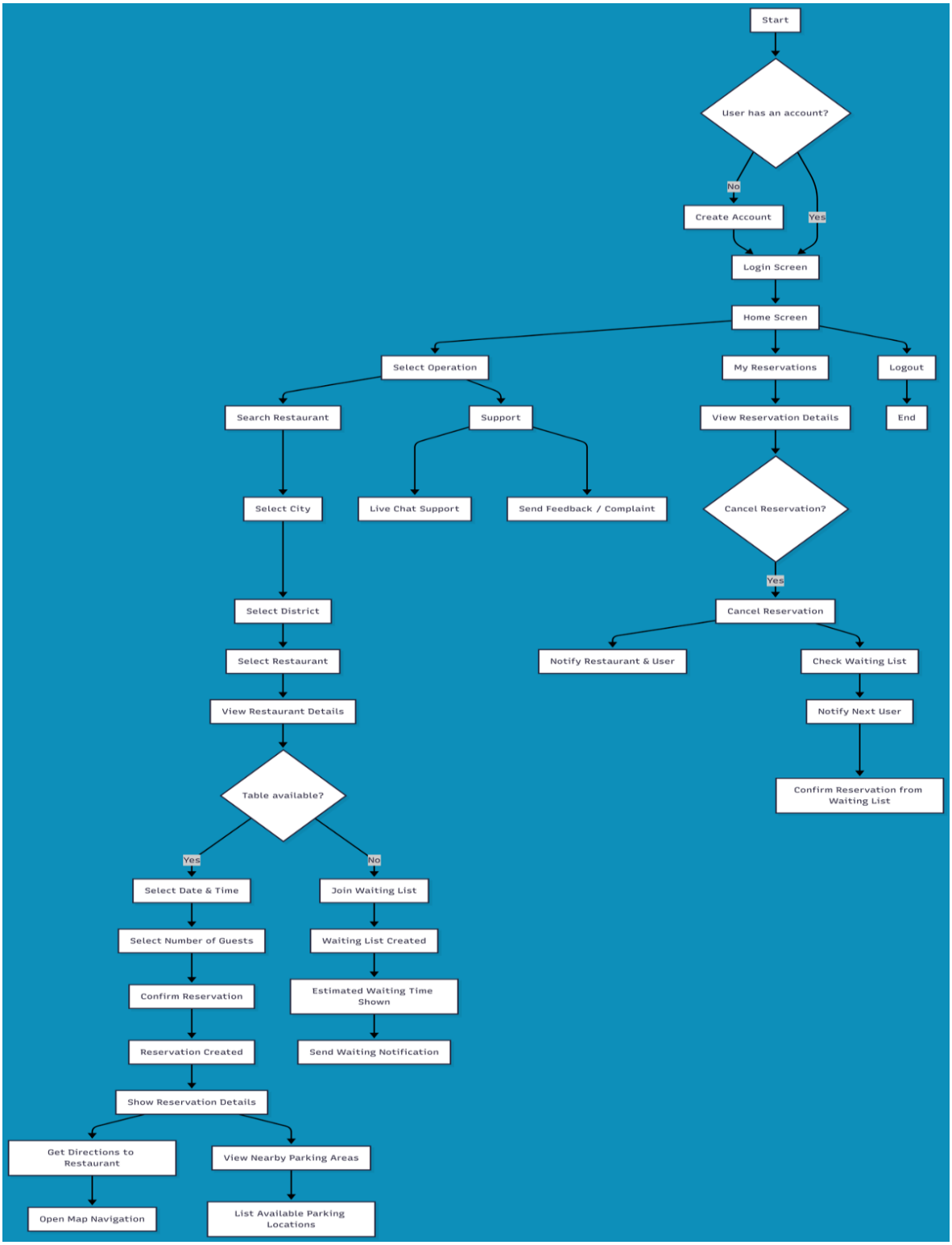
Status Table

Status Name	**Creating a restaurant reservation**		**Process No:5**	
Description	**Restaurant reservation creation and confirmation process via mobile application**			
Trigger	**User selects restaurant, date, time and number of people and submits reservation request**			
Trigger Type	**External user**	**Internal user**	**Another Process**	**Another Transaction**
Entry Name	**Source**	**Output**	**Target**	
Restaurant selection	Customer (user)	Reservation request created	Reservation database	
Date & time	Customer (user)	Reservation details saved	Reservation system	
Number of people	Customer (user)	Table availability check	AI / Table management module	
Payment / deposit info	Customer (user)	Reservation confirmation	Payment system	
Steps	**1. The system receives reservation data entered by the user. 2. The selected restaurant availability is checked in real time. 3. AI module evaluates table capacity and waiting time. 4. If available, a table is assigned automatically. 5. If not available, the user is added to the waiting list. 6. Deposit payment is requested if required. 7. Reservation details are saved and confirmation is sent.**			
Descriptions	**The system validates date and time selections. Table capacity must match the number of guests. Waiting list priority is determined by arrival order. Users receive confirmation via notification or SMS. Unconfirmed reservations are automatically canceled after timeout.**			

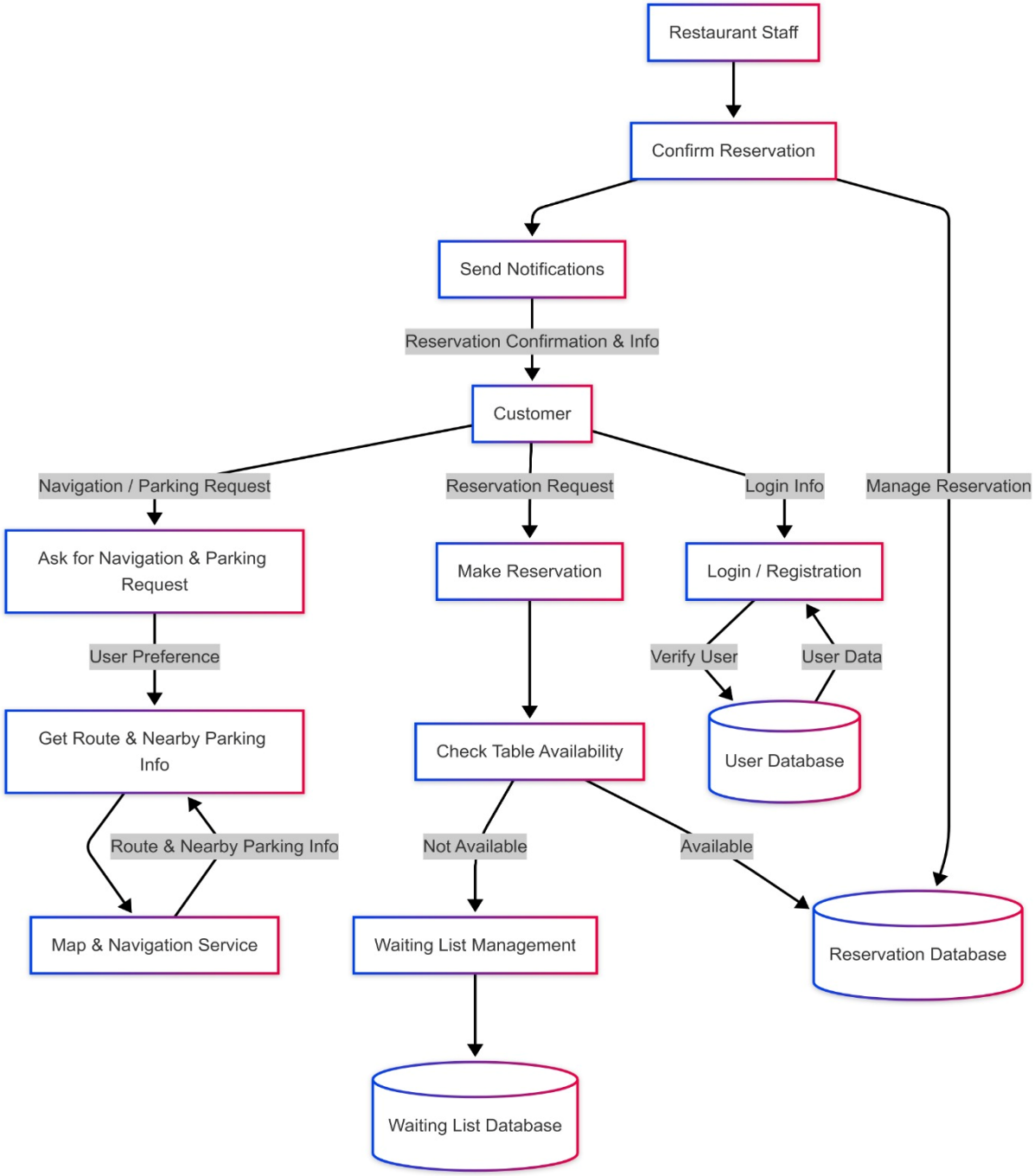
Event Table

EVENT	GENERAL SOURCE	USE CASE	ACTIVITY	RESPONSE	DESTINATION
Login the system	User	User login	Check credentials and redirect to home page	Home Page	User
User Information	User	Profile information	Verify user contact and address information	Profile Verification Page	User
Restaurant Selection	User	Restaurant browsing	Display available restaurants and details	Restaurant List Page	User
Reservation	User	Table reservation	Verify availability and create reservation	Reservation Confirmation Page	User
Waiting List	User	Queue management	Add user to waiting list if table unavailable	Waiting List Page	User
Payment	User	Reservation payment	Process deposit or payment transaction	Payment Confirmation	User
Restaurant Dashboard	Restaurant Manager	Reservation management	View and manage reservations	Dashboard Page	Manager
Notification	System	User notification	Send reservation and reminder notifications	Notification Sent	User

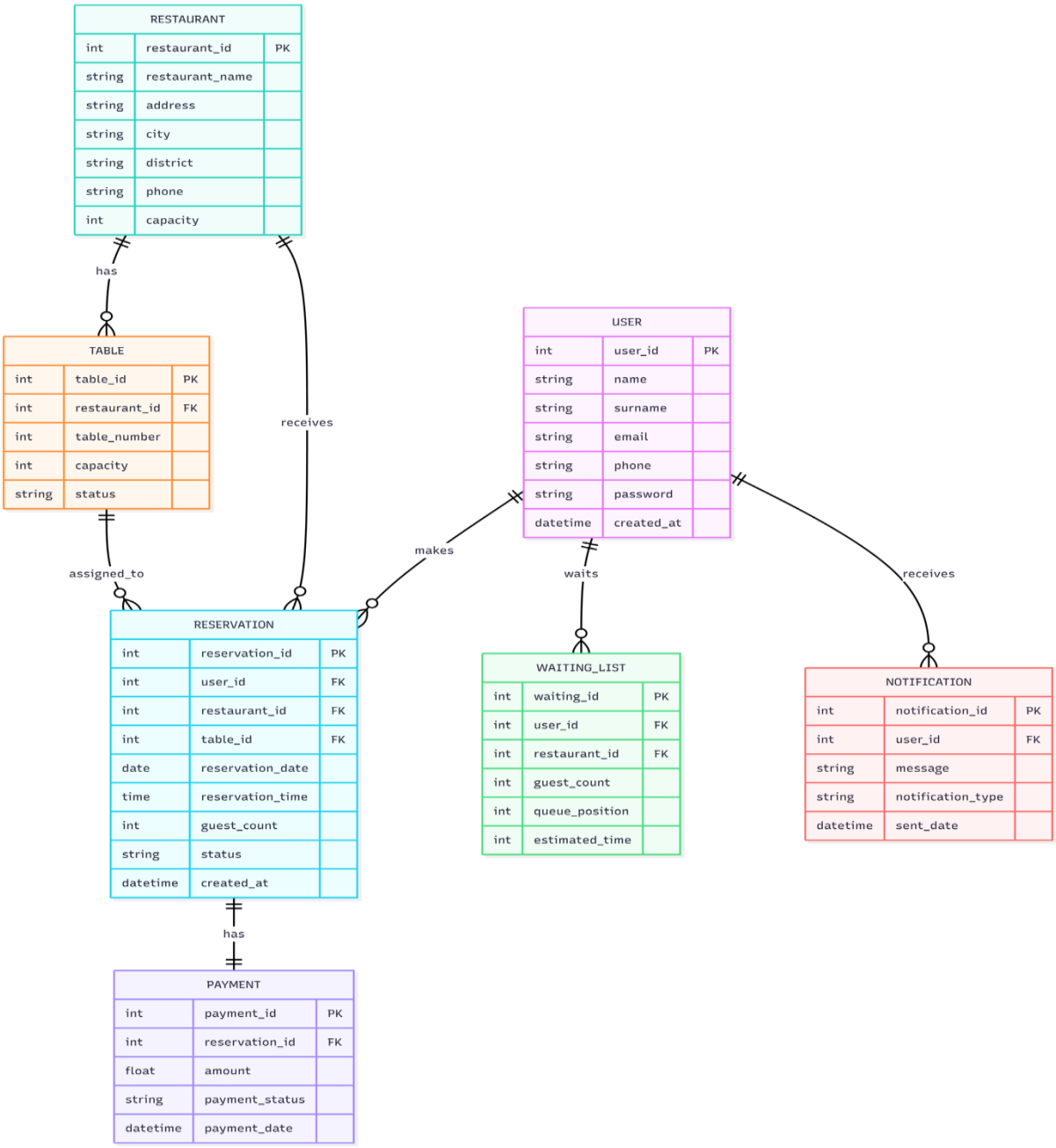
Work Flow Chart



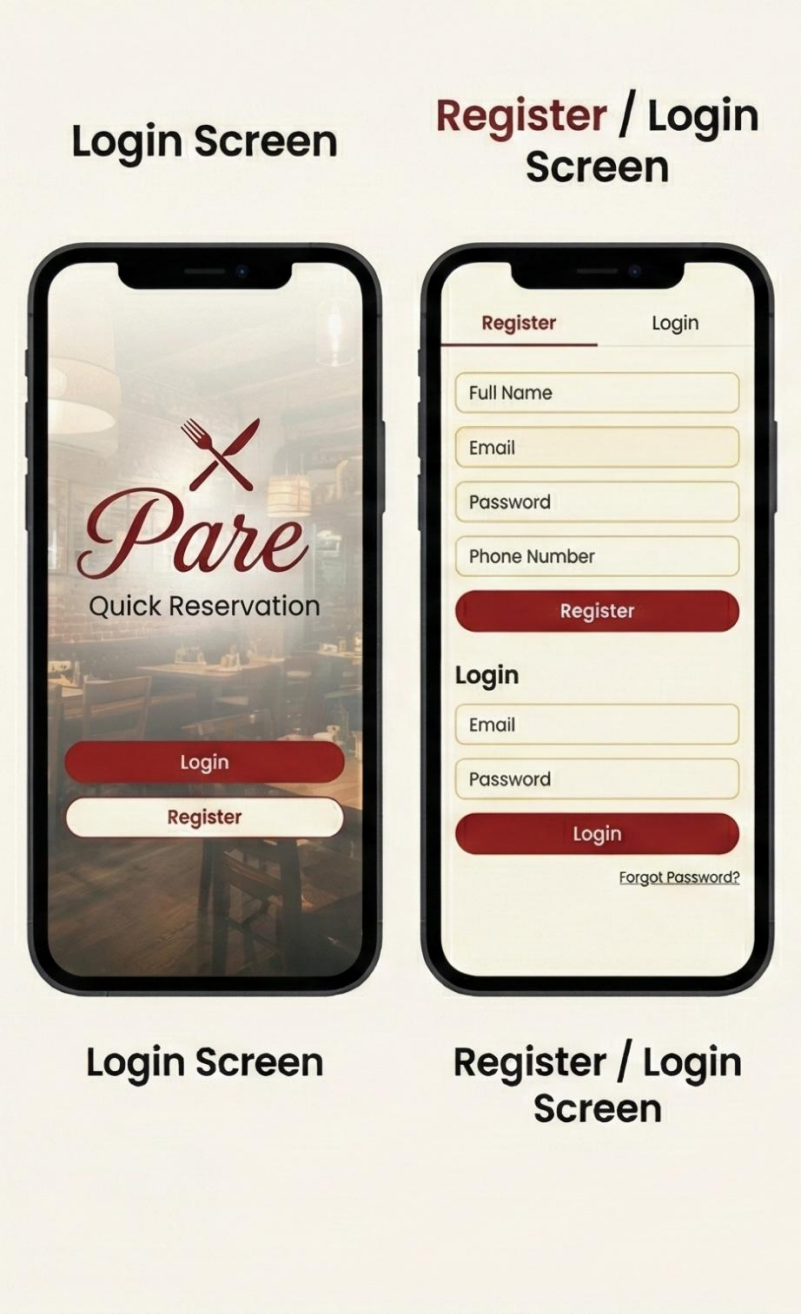
Data Flow Chart



Database Diagram



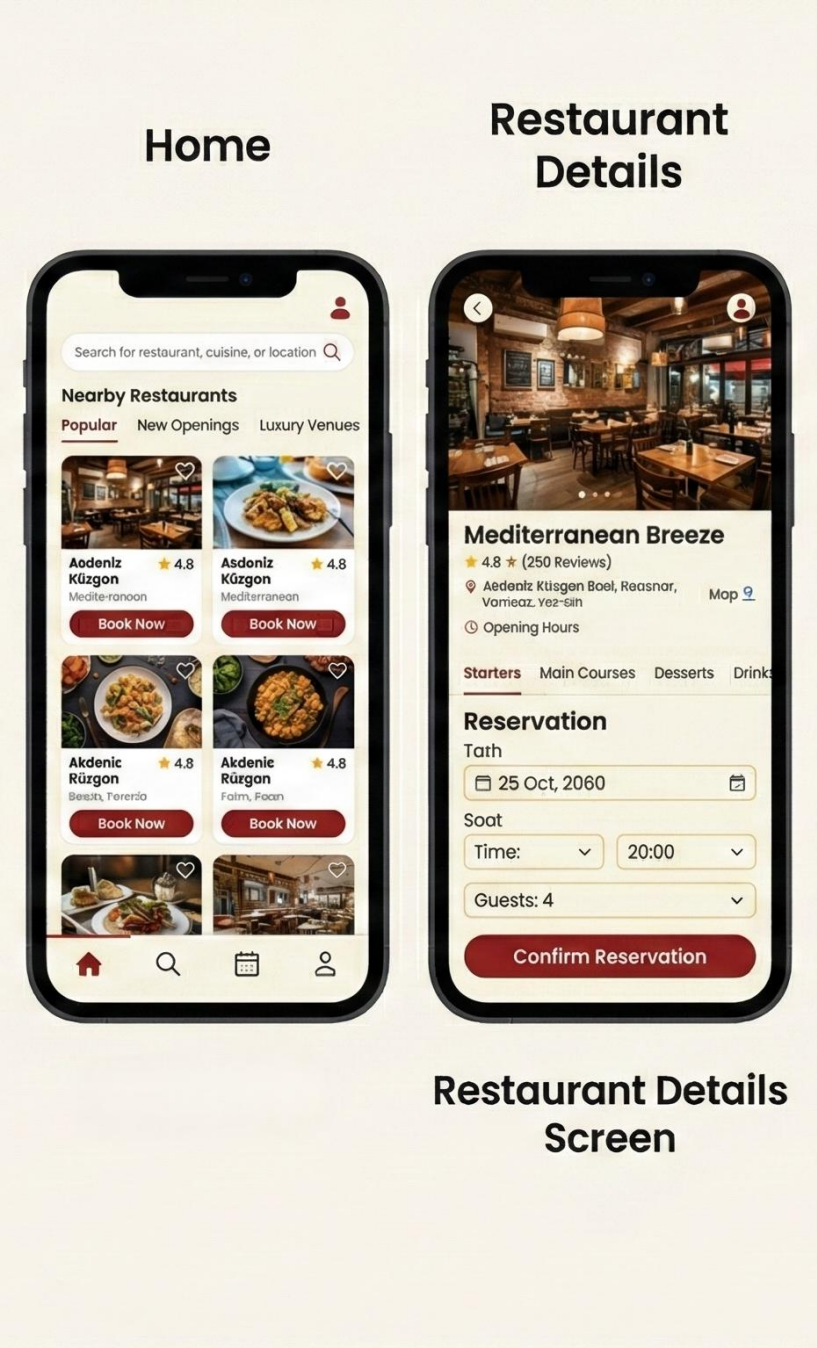
INTERFACES



Part 1: Getting Started (Left Panel)

Step into the world of Pare.

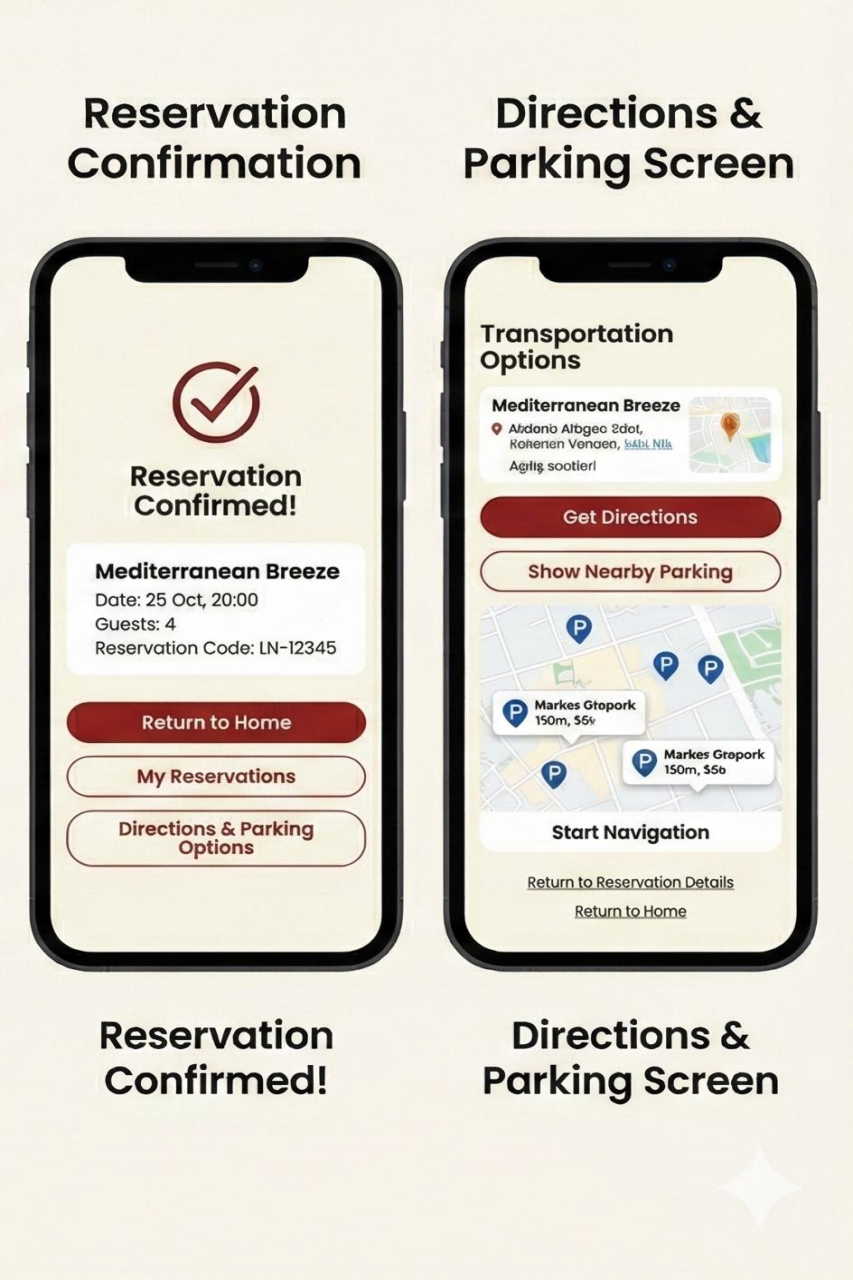
1. When you open the app, a stylish welcome screen awaits. Tap the **"Login"** button to continue with an existing account, or tap **"Register"** to create a new one.
2. If you choose to register, fill in your Full Name, Email, Password, and Phone Number in the form that appears, then tap the burgundy **"Register"** button to complete your sign-up.



Part 2: Restaurant Discovery and Reservation (Middle Panel)

Book your spot for the perfect meal.

1. Once on the **Home** screen, find the restaurant you want to visit by using the search bar at the top or browsing categories like "Popular," and tap on its restaurant card.
2. On the restaurant details screen, you can review the menu or opening hours.
3. To make a reservation, scroll down. Select your desired **Date**, **Time**, and number of **Guests**.
4. Once everything is set, tap the **"Confirm Reservation"** button at the bottom.



Part 3: Confirmation and Getting There (Right Panel)

Your reservation is ready; time to head out.

1. Congratulations! You will see the **"Reservation Confirmed!"** screen along with your unique reservation code.
2. To plan how to get to the venue, tap the **"Directions & Parking Options"** button on this screen.
3. On the transportation screen, use the **"Get Directions"** button to start your navigation app. If you are looking for parking for your vehicle, tap the **"Show Nearby Parking"** button to view parking spots and their fees directly on the map.

CONCLUSION

In this project, the main focus was on the problems arising from traditional restaurant reservation practices. As stated in the problem definition, reservations are mostly managed through phone calls or walk-in requests, which leads to long waiting times, inaccurate information, operational confusion, and increased workload for restaurant staff. From the user perspective, the uncertainty regarding table availability and waiting duration causes dissatisfaction and discourages customers from choosing busy restaurants.

Based on these problems, a mobile-based reservation and waiting list system was proposed. The aim of the project was to transfer the existing manual processes into a digital environment and create a more organized, transparent, and efficient system. By allowing users to make reservations, track waiting lists, and receive real-time updates, the proposed system addresses the core issues identified in the problem analysis.

During the project, general system requirements and workflows were examined to ensure that the solution is practical and applicable. Basic analysis techniques were used to understand user needs and system behavior, and the overall structure of the system was designed to support real-time data flow and accurate information sharing. The system was planned in a way that benefits both restaurant operators and customers by reducing uncertainty and improving coordination.

As a result, the proposed restaurant reservation and waiting list system offers a modern and effective solution to the problems observed in traditional reservation methods. By digitizing the process and supporting it with intelligent features, the system contributes

to improved customer satisfaction, reduced operational complexity, and more efficient restaurant management. Overall, this project demonstrates the importance of digital transformation in service-based systems and highlights how technology can be used to solve real-life operational problems.