BakeryBliss

Team Anonymous

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Bakery Bliss - SRS Report

1. Proposed Proposal

Bakery Bliss is a full-stack web application designed for bakery management. The platform integrates customer ordering, custom cake design, baker team management, and real-time communication. It is built using React 18, TypeScript, Node.js, and PostgreSQL.

2. Motivation

Bakery Bliss was inspired by the need for a unified, modern bakery management system that could handle custom orders, team collaboration, and real-time communication. Traditional systems lack customization, efficiency, and transparency in order handling.

3. Objective

To develop an enterprise-level bakery management system with:

- Real-time custom cake design and preview
- Role-based task assignment and tracking
- Intelligent pricing and order management
- Real-time communication system among users

4. Scope

The system includes user registration, custom cake builder, real-time communication, task management, inventory tracking, and payment integration. It excludes on-site delivery or third-party logistics management.

Bakery Bliss - SRS Report

5. Benchmark Analysis

Compared to platforms like UberEats or Shopify, Bakery Bliss is tailored specifically for bakeries. It provides a unique cake builder, hierarchical team roles, and a performance tracking dashboard, which are not present in typical food ordering systems.

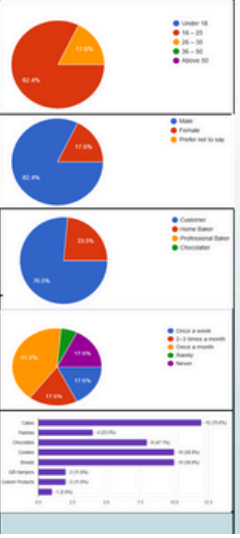
Benchmark Analysis:

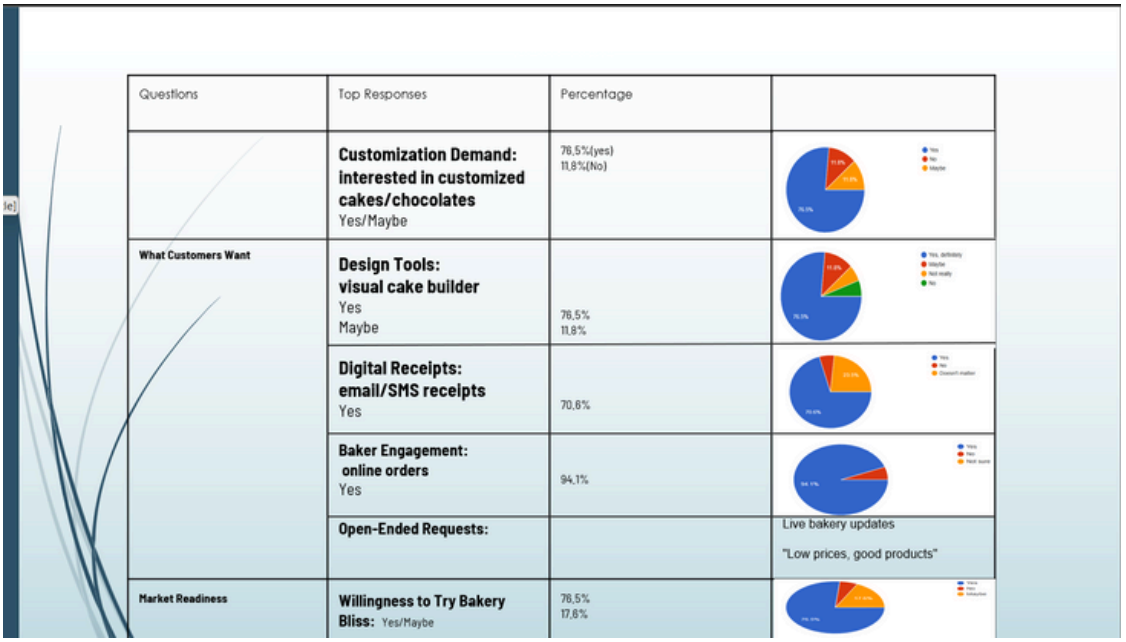
Feature	Bakery Bliss	Uber Eats	Bakehoney	CakeZone
Custom Cake Ordering	Yes	No	Yes	Yes
Order Tracking	Yes	No	No	No
Manage Task Distribution	Yes	No	No	No
User-Baker Promotion	Yes	No	No	No
Chat Feature	Yes	No	No	No
Track Earning	Yes	No	No	Yes
Baker Requirement	Yes	No	Yes	Yes
Review and Rating	Yes	No	No	Yes
Payment Integration	Yes	Yes	Yes	Yes

6. Feasibility Analysis

Survey Results

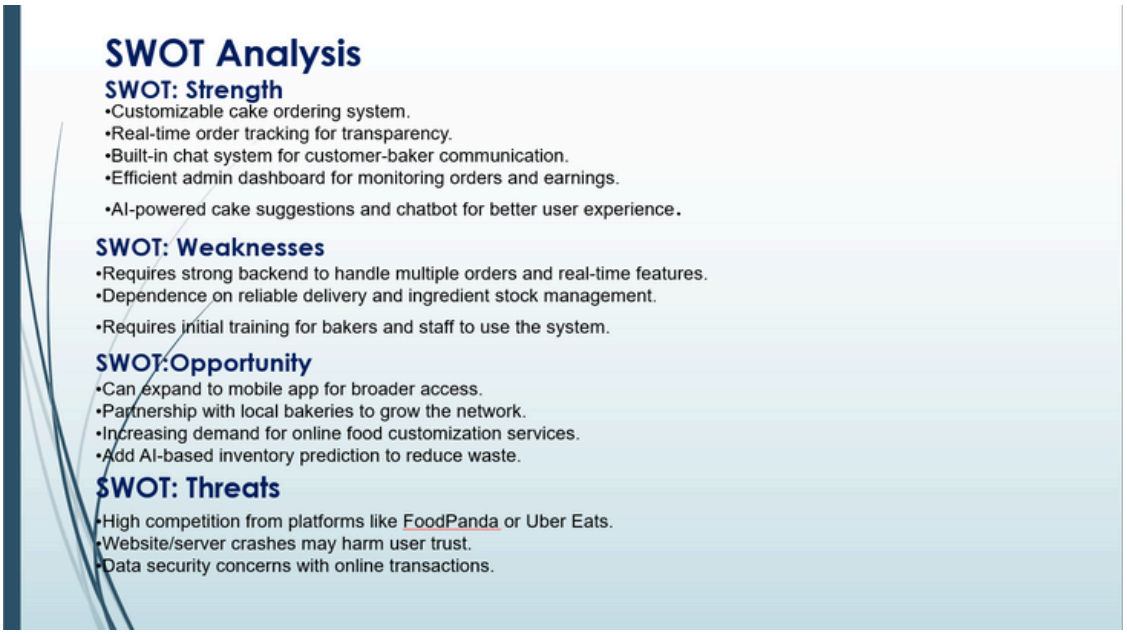
Questions	Top Responses	Percentage
Who We Surveyed	**Age Groups:**	
	aged 18-26 (primary target)	82,4%
	other ages (Highlight the young adult focus)	17,6%
	Gender:	
	Female	17,6%
	Male	82,4%
	Roles:	
	Majority: Customers	76,5%
	Minority: Home Bakers	23,5%
Customer Behavior Insights	**Order Frequency:**	
	Once a month	41,2%
	2-3 times a month	17,6%
	Rarely	5%
	Popular Products:	
	Cakes	70,6%
	Cookies	58,8%
	Chocolate	47,1%





Questions	Top Responses	Percentage	
	Customization Demand: interested in customized cakes/chocolates Yes/Maybe	76,5%(yes) 11,8%(No)	
What Customers Want	**Design Tools: visual cake builder** Yes Maybe	76,5% 11,8%	
	Digital Receipts: email/SMS receipts Yes	70,6%	
	Baker Engagement: online orders Yes	94,1%	
	Open-Ended Requests:		Live bakery updates "Low prices, good products"
Market Readiness	**Willingness to Try Bakery Bliss:** Yes/Maybe	76,5% 17,6%	

7. SWOT Analysis



8. Validation and Verification

8.1 Testing Requirements

8.1.1 Unit Testing

Status: 58/58 tests passing

- **Frontend**: React components, UI interactions, form validation
- **Backend**: API endpoints, business logic, database operations
- **Utils**: Data formatting, calculations, validation functions

8.1.2 Integration Testing

Status: 49/49 tests passing

- **API Integration**: Frontend-backend communication
- **Database Integration**: Complex queries and transactions
- **Third-party Services**: PostgreSQL, file storage, notifications

8.1.3 User Acceptance Testing

- **Customer Journey**: Registration → Design → Order → Track
- **Baker Workflow**: Application → Orders → Communication → Earnings
- **Admin Operations**: User management, analytics, system config

Quality Metrics

✅ All performance benchmarks met

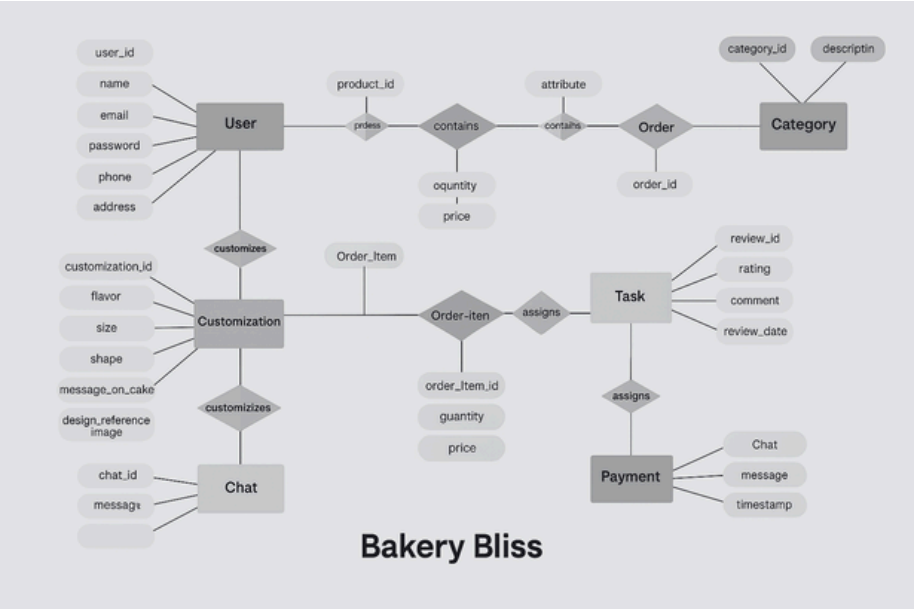
✅ Security validation completed

✅ Usability requirements satisfied

✅ Browser compatibility verified

✅ Accessibility standards compliant

9. Diagram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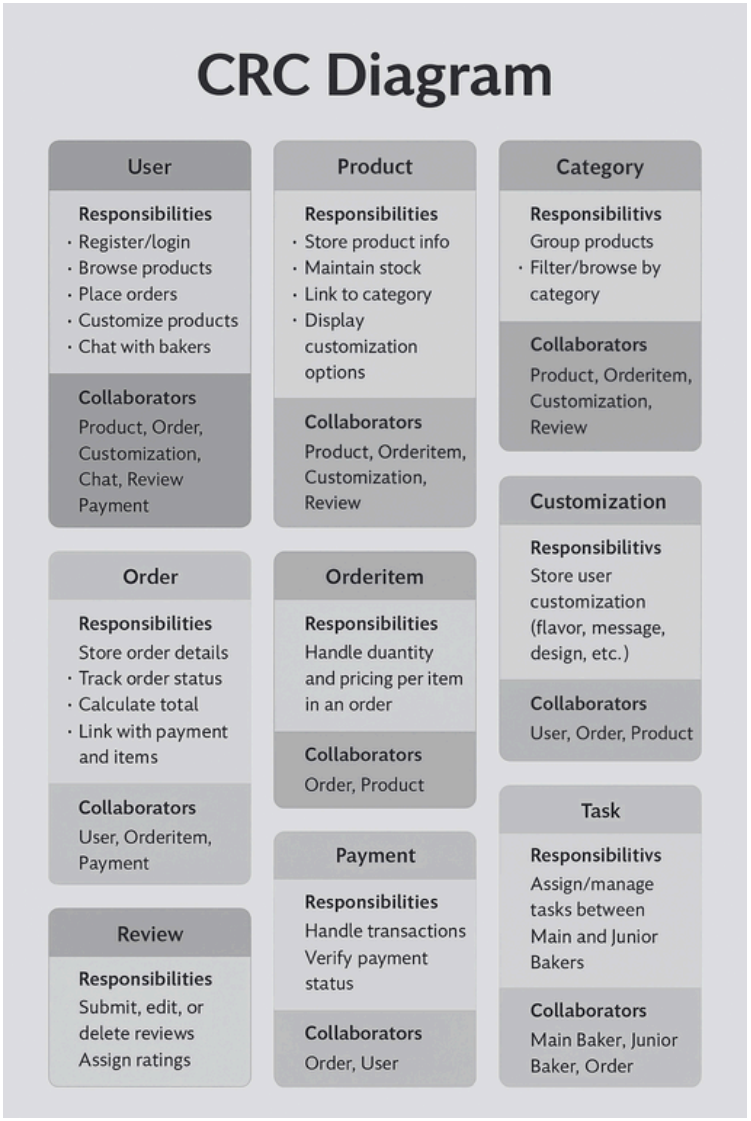

CRC Diagram
User
Responsibilities
· Register/login
· Browse products
· Place orders
· Customize products
· Chat with bakers
Collaborators
Product, Order, Customization, Chat, Review Payment
Product
Responsibilities
· Store product info
· Maintain stock
· Link to category
· Display customization options
Collaborators
Product, Orderitem, Customization, Review
Category
Responsibilitivs
Group products
· Filter/browse by category
Collaborators
Product, Orderitem, Customization, Review
Order
Responsibilities
Store order details
· Track order status
· Calculate total
· Link with payment and items
Collaborators
User, Orderitem, Payment
Orderitem
Responsibilities
Handle duantity and pricing per item in an order
Collaborators
Order, Product
Customization
Responsibilitivs
Store user customization (flavor, message, design, etc.)
Collaborators
User, Order, Product
Review
Responsibilities
Submit, edit, or delete reviews
Assign ratings
Payment
Responsibilities
Handle transactions
Verify payment status
Collaborators
Order, User
Task
Responsibilitivs
Assign/manage tasks between Main and Junior Bakers
Collaborators
Main Baker, Junior Baker, Order

10. Use Cases

10.1 Scenarios

- **User Registration and Authentication** : Users can register by providing an email and password and selecting a role. The system authenticates users with their credentials and uses session-based management to ensure secure, role-based access for Customers, Junior Bakers, Main Bakers, and Administrators.
- **Design a Custom Cake** : Customers can use an interactive visual cake builder to design a personalized cake. They can select options for layers, shapes, colors, and decorations, with the system providing a real-time visual preview and dynamic pricing based on their choices.
- **Manage Orders** : Customers place and track orders from creation to delivery. Main Bakers assign these orders to Junior Bakers, who update the order's status as it moves through processing, quality check, and finally to delivery.
- **Communication Tools** : Customers, Junior Bakers, and Main Bakers can communicate with each other through an order-specific, real-time chat system. The system maintains a message history for reference.
- **Track Baker Earnings** : The system automatically calculates and distributes commissions to bakers when an order is marked as "delivered". Bakers can access their own dashboards to track their total earnings and view a detailed history and breakdown.
- **Manage Career Progression** : Customers can apply to become Junior Bakers, and Junior Bakers can apply for a promotion to Main Baker. The system facilitates an application review and approval workflow, automatically updating user roles once an application is approved.
- **Manage User Accounts** : Administrators can manage user accounts, oversee system configurations, and review platform-wide analytics and reports to monitor operations.
- **Perform Quality Control** : Main Bakers conduct a quality check on completed orders to ensure they meet required standards before being marked as "ready" for the customer. This is a mandatory step in the order lifecycle.
- **View Performance Reports** : Users can access role-specific dashboards to view analytics. These reports track metrics like order completion rates, financial summaries, and overall user engagement on the platform.

10. Use Cases

10.2 User Stories

Custom Order Placement

- Includes: User Authentication
- A customer designs a custom cake, adds it to an order, places the order, and tracks its status through the system.

Order Fulfillment

- Includes: Team Communication, Quality Control
- A Main Baker assigns an incoming order to a Junior Baker on their team. The Junior Baker works on the order and updates its status accordingly.

Financial Management

- The system calculates and tracks commissions for Junior and Main Bakers based on completed orders. Bakers can view reports on their earnings.

Team Communication

- A customer and the bakers assigned to their order communicate through an order-specific chat room to clarify details.

Career Progression Management

- A customer applies for a Junior Baker position, and the application is reviewed by a Main Baker. A Junior Baker applies for a promotion, which is then managed by an administrator.

Quality Control

- A Main Baker inspects a completed order to approve its quality before it can be delivered to the customer.

User Authentication

- A Customer, Junior Baker, Main Baker, or Administrator logs into the Bakery Bliss platform to securely access features based on their assigned role.

System Administration

- An Administrator manages user roles and accounts, configures system settings, and monitors overall platform performance and analytics.

11. Feature List - Functional

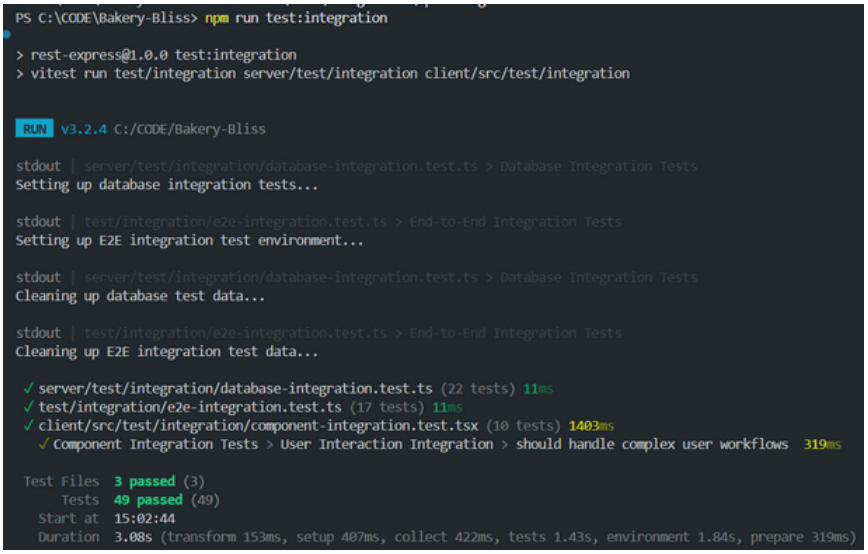
- User Registration
- Allows new users to sign up with role selection (e.g., Customer, Junior Baker).
- Custom Cake Builder
- An interactive, drag-and-drop system for designing personalized cakes with real-time preview.
- Order Lifecycle Management
- Supports full order flow: creation, assignment, processing, quality check, and completion.
- Real-Time Order Tracking
- Customers can track order status updates in real time.
- Role-Based Access Control
- Access and features vary by user type (Customer, Junior Baker, Main Baker, Admin).
- Direct Messaging System
- Order-specific chats enabling communication between customers and bakers.
- Junior Baker Task Management
- Dashboard to view assigned tasks and update their statuses.
- Admin User Management
- Admins can manage all users, update roles, and monitor platform activity.
- Dynamic Price Calculation
- Cake pricing changes automatically based on layer count, decorations, and weight.
- Earnings Tracking for Bakers
- Real-time financial tracking for Junior and Main Bakers based on order completion.
- Team Management by Main Bakers
- Main Bakers can assign tasks, track performance, and manage teams.
- Wishlist/Favorites System
- Customers can save preferred products for later purchases.
- Application Workflow for Role Upgrades
- Users can apply to become Junior or Main Bakers, with review and approval processes.
- Performance Analytics Dashboard
- Visual dashboards for tracking performance, satisfaction, and revenue metrics.
- Secure Login with JWT Authentication
- Provides session-based login using JSON Web Tokens for enhanced security.

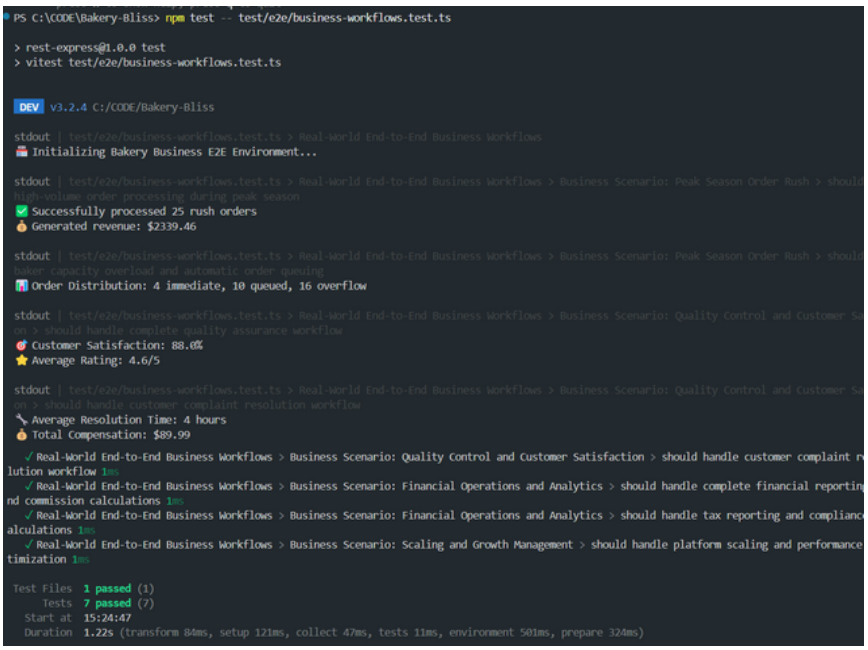
12. Feature List - Non-Functional

- Responsive Design
- The system follows a mobile-first approach with responsive layouts for all device sizes.
- Role-Based Access Control (RBAC)
- Four-tier user hierarchy enforced using secure authorization middleware.
- Optimized Build Process
- Uses Vite with ESBuild for fast development builds and optimized production bundles.
- Code Splitting & Lazy Loading
- Loads only the required components, improving performance and load time.
- Secure Password Encryption
- Implements Bcrypt hashing with salting for secure credential storage.
- TanStack Query Caching
- Intelligent client-side caching and data revalidation for enhanced data performance.
- Error Handling and Graceful Degradation
- React error boundaries and fallback UIs ensure uninterrupted user experience during failures.
- Accessibility Compliance
- WCAG-compliant UI design with ARIA labels, semantic HTML, and keyboard navigation.
- Comprehensive Test Suite
- Includes 100+ unit, integration, and end-to-end tests for code reliability.
- CI/CD Ready Deployment
- Supports continuous integration and deployment pipelines for efficient development workflows.
- Scalable Architecture
- Designed with modular service layers and stateless deployment for horizontal scalability.
- Health Monitoring
- Includes system health check endpoints and monitoring tools for uptime tracking.
- Environment-Based Configuration Management
- Uses .env files and environment variables for secure and flexible system configuration.
- Rate Limiting Protection
- Prevents abuse and DDoS attacks via built-in API rate-limiting mechanisms.
- Component Reusability and Maintainability
- UI components are modular, documented, and built using a consistent design system (Radix UI + Tailwind CSS).

13. Testing Techniques Implemented

Implemented component testing, unit testing for backend logic, and integration testing for order workflows. Manual user acceptance testing ensured usability and performance standards were met.





14. Technical Difficulties

- Complex State Management
- Difficult to manage shared state across multiple user roles and interactions.
- Database Query Performance
- Inefficient queries (e.g., N+1 problems) and complex joins slow down the system.
- Code Complexity
- Large, monolithic functions are hard to test and maintain.
- Inconsistent Error Handling
- Missing or inconsistent try-catch blocks cause unpredictable behavior.
- Loose Type Safety
- Usage of any types reduces reliability and increases risk of runtime errors.
- Authorization & Access Control Complexity
- Four-tier role system introduces security and logic complications.
- Frontend Performance Bottlenecks
- Unoptimized React components cause slow UI and re-renders.
- Real-Time Chat Complexity
- Handling participant logic and synchronization in chat is error-prone.
- Test Coverage Gaps
- Critical features lack full unit or integration test coverage.
- Scalability Limitations
- Session-based architecture hinders horizontal scaling.
- Monitoring Deficiencies
- Limited system monitoring and performance analytics reduce observability.

15. Conclusion and Future Work

Bakery Bliss is a production-ready platform demonstrating scalable and modular architecture. Future enhancements include mobile app development, AI-based cake design suggestions, and supply chain automation.

16. Appendices

API: Application Programming Interface - methods for communication between software components Baker

Commission: Percentage-based payment for completed orders

Custom Cake: User-designed cake with specific layers, shapes, colors, and decorations

Junior Baker: Entry-level baker role responsible for order execution

Main Baker: Senior baker role responsible for team management and quality control

Order Lifecycle: Complete process from order creation to delivery

Quality Check: Review process ensuring order meets standards before delivery

Role-Based Access: Permission system based on user roles and responsibilities

Session Management: System for maintaining user authentication state WebSocket: Protocol enabling real-time bidirectional communication