📊 BÁO CÁO TỰ ĐÁNH GIÁ DỰ ÁN - SMART RESTAURANT MANAGEMENT SYSTEM

Dự án: Smart Restaurant - Hệ thống Quản lý Nhà hàng Thông minh
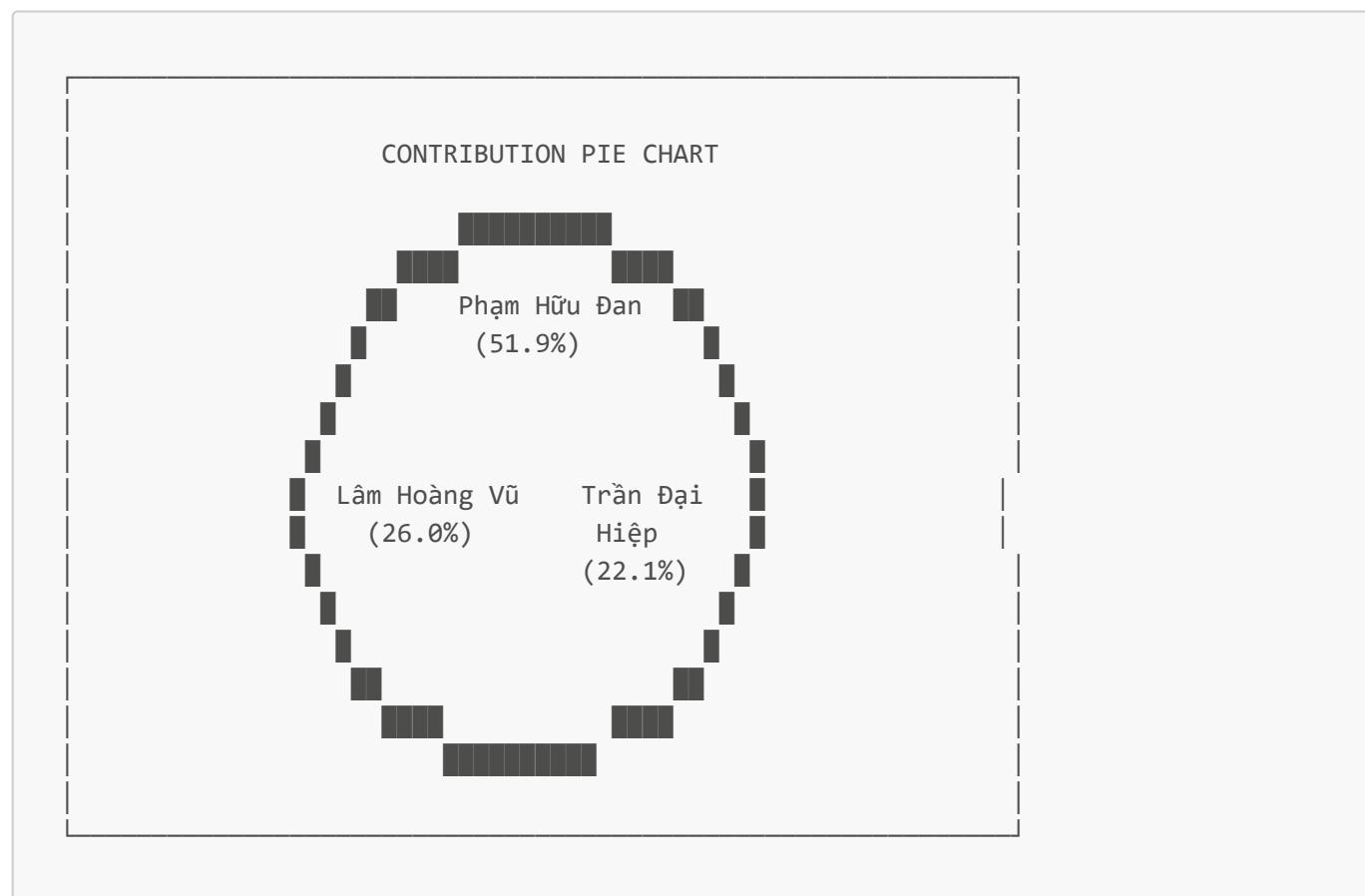**Team:** 20120450-23120256-23122056
GitHub Repository: https://github.com/Hidebray/smart-restaurant
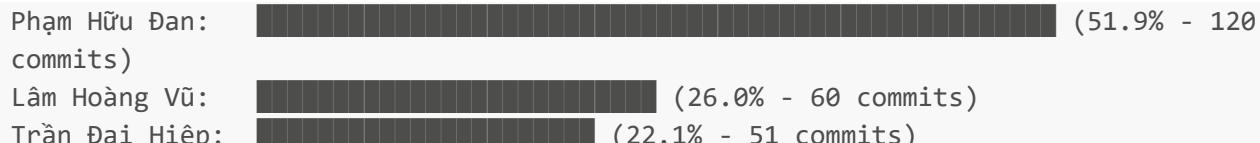
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1. THÔNG TIN NHÓM VÀ ĐÓNG GÓP

1.1. Danh sách thành viên

MSSV	Họ và Tên	Vai trò	Commits	Tỷ lệ
20120450	Phạm Hữu Đan	Frontend Developer, UI/UX Designer, Integration	120	51.9%
23120256	Trần Đại Hiệp	Backend Developer, Database Architect, Real-time Features	51	22.1%
23122056	Lâm Hoàng Vũ	Full-stack Developer, Git Manager, QA & Code Review	60	26.0%

Tổng commits: 231 commits

1.2. Biểu đồ đóng góp (Contribution Pie Chart)

```
    Phạm Hữu Đan:  ████████████████████████████████ (51.9% - 120
    commits)
    Lâm Hoàng Vũ:  ████████████████ (26.0% - 60 commits)
    Trần Đại Hiệp: █████████████ (22.1% - 51 commits)
```

1.3. Phân tích đóng góp chi tiết từng thành viên

🔒 Phạm Hữu Đan (51.9% - 120 commits)

Vai trò: Frontend Developer, UI/UX Designer, Integration
Thời gian hoạt động: 2026-01-12 → 2026-01-20

Công việc đã hoàn thành:

- ☑ Phát triển toàn bộ giao diện frontend (Next.js)
- ☑ Implement UI/UX cho tất cả các trang: Customer, Admin, Waiter, Kitchen
- ☑ Multi-language support (EN/VI) với i18n
- ☑ Thiết kế responsive design cho mobile
- ☑ Implement authentication flows (login, register, forgot password)
- ☑ Guest menu page với search, filtering, pagination
- ☑ Cart và ordering system
- ☑ Admin dashboard: Staff management, Categories, Products, Orders, Tables
- ☑ Reports với interactive charts
- ☑ Cloudinary integration cho upload ảnh
- ☑ Stripe payment integration (frontend)
- ☑ Role-based access control trong middleware
- ☑ Fix bugs và cải thiện UX liên tục

Bằng chứng (Evidence):

- Git commits: `ebed3c0`, `902d887`, `b841108`, `7cebe33`, `f10232d`, `ceb3e97`, `ed711cc`, `81dd32b`
- Files: `frontend/src/app/guest/`, `frontend/src/app/admin/`, `frontend/src/contexts/I18nContext.tsx`, `frontend/src/middleware.ts`

🔒 Trần Đại Hiệp (22.1% - 51 commits)

Vai trò: Backend Developer, Database Architect, Real-time Features
Thời gian hoạt động: 2026-01-05 → 2026-01-19

Công việc đã hoàn thành:

- ☑ Khởi tạo project và setup Docker PostgreSQL
- ☑ Thiết kế database schema với Prisma
- ☑ Xây dựng backend API (NestJS)
- ☑ Implement JWT authentication và authorization
- ☑ Setup Socket.IO server cho real-time features
- ☑ Kitchen KDS dashboard với realtime order updates
- ☑ Waiter dashboard và kitchen workflow

- ☑ Table management và QR code generation
- ☑ Product modifier management, Bill modal và payment demo
- ☑ Stripe integration cho online payments (backend)
- ☑ QR code download as PNG, Print bill functionality
- ☑ Fuzzy search, customer reviews, Order timer cho KDS
- ☑ Chef recommendations và product popularity tracking

Bằng chứng (Evidence):

- Git commits: 9ee76be, 1ba4dbc, 26d3a73, 85b3a75, e619957, 5d1a82d, 0942ef0, 2ed3636
- Files: backend/prisma/schema.prisma, backend/src/products/, backend/src/orders/, backend/src/auth/, backend/src/socket/

🔒 Lâm Hoàng Vũ (26.0% - 60 commits)

Vai trò: Full-stack Developer, Git Manager, QA & Code Review
Thời gian hoạt động: 2026-01-15 → 2026-01-20

Công việc đã hoàn thành:

- ☑ Setup admin layout và product list view
- ☑ Admin products management và reports feature với revenue charts
- ☑ Discount functionality và billing display
- ☑ Loyalty points system với tiers và voucher management
- ☑ Inventory management system với stock validation
- ☑ Table reservation system
- ☑ Analytics module và Advanced Analytics Dashboard
- ☑ Quản lý Git repository và merge pull requests (#1-#23)
- ☑ Code review, integration và localization updates
- ☑ Enhance seed data script với user roles, loyalty points, vouchers
- ☑ Fix admin dashboard to use real data from API
- ☑ Add inventory stock validation when creating orders

Bằng chứng (Evidence):

- Git commits: c1f383a, b7dddb9, 2c14081, ee8de9b, 698b317, 8af72ea, da73a29, 57c8d3f
- Pull Requests: #1 - #23
- Files: backend/src/loyalty/, backend/src/inventory/, backend/src/reservations/, docker-compose.prod.yml

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2. ĐÁNH GIÁ TÍNH NĂNG (FEATURE LIST)

Project: Smart Restaurant - QR Menu Ordering System

Students must input minus points to every uncompleted feature in the SE column.

*SE: Self-evaluation

*TR: Teacher review

ID	Features	Grade			Notes
		Point	**SE***	**TR***	
1	**Overall requirements**				
	User-centered design	-5	0		Built with user experience in mind, not just feature list. Focus on solving real restaurant problems: seamless QR ordering, efficient waiter workflow, real-time kitchen coordination, and convenient payment options
	Database design	-1	0		Database with tables: users, restaurants, menus, menu_items, categories, modifiers, tables, orders, order_items, payments
	Database mock data	-1	0		Sample restaurants, menu items, categories, tables, and test orders
	Website layout	-2	0		Two layouts: Customer mobile ordering interface and Admin dashboard
	Website architect	-3	0		Based on MVC architecture. Clear separation of concerns with controllers, services, repositories. Client-side validation, Input validation, Business rule validation
	Website stability and compatibility	-2	0		Mobile-first responsive design, tested on Chrome and Safari
	Document	-1	0		Clear documentation for developers and users: setup guide, API endpoints, database design, system architecture, user guide
	Demo video	-5	0		Video demonstrating all features: restaurant signup, menu management, QR ordering, payment, KDS
	Publish to public hosts	-1	0		Deployed to a public hosting service with accessible URL
	Development progress is recorded in Github	-7	0		Git history with meaningful commits, branches for features, pull requests
2	**Guest features (Customer Ordering)**				
	Home page (Menu page)	-0.25	0		Restaurant menu page loaded via QR code scan with categories and items

ID	Features	Grade		Notes
	View list of menu items	-0.25	0	Display menu items with images, prices, descriptions
	Filter menu items by			A combination of the criteria
	› Item name	-0.25	0	Search menu items by name
	› Category	-0.25	0	Filter by food categories (Appetizers, Main Dishes, Drinks, Desserts)
	Sort menu items by popularity	-0.25	0	Sort by most ordered items
	› Chef recommendation	-0.25	0	Filter/highlight items marked as chef's recommendations
	Menu item paging	-0.75	0	Pagination for large menus with infinite scroll. URL updated on search/filter/paging
	View menu item details	-0.25	0	Item detail page with full description, modifiers, allergen info
	View menu item status	-0.25	0	Display item availability status (Available, Unavailable, Sold out)
	Show related menu items	-0.25	0	Suggest items from same category or popular pairings
	View list of item reviews	-0.5	0	Customer reviews for menu items with pagination
	Add a new item review	-0.25	0	Logged-in customers can review items they ordered
	Shopping cart (Order Cart)			
	› Add a menu item to the Cart	-0.25	0	Add items with quantity selection
	› View and update items in the Cart	-0.5	0	Cart summary with items, quantities, modifiers, prices. Update quantity with auto-update totals
	Ordering and payment (Dine-in)			
	› Bind the shopping cart to the table session	-0.25	0	Cart persists for table session

ID	Features	Grade		Notes
	› Input order details (notes, special requests)	-0.25	0	Guest name, special instructions field
	› Add items to current order	-0.25	0	Customers can add more items to their unpaid order (single order per table session)
	› View order status	-0.25	0	Guest can track order status (Received → Preparing → Ready)
	› View order details	-0.25	0	Order confirmation with items, total, table number
	› Request bill	-0.25	0	Customer requests bill when ready to pay
	› Process payment after meal	-0.25	0	Stripe payment processing after dining
3	**Authentication and authorization**			
	Use a popular authentication library	-1	0	Passport.js with JWT strategy
	Registration (Customer Signup)	-0.5	0	Customer registration with email/password. Real-time email availability check
	Verify user input: password complexity, full name	-0.25	0	Password rules, required fields validation
	Account activation by email	-0.25	0	Email verification link sent on signup
	Social Sign-up/Sign-In	-0.25	0	Google OAuth integration
	Login to the website	-0.25	0	JWT-based authentication for admin/staff
	Authorize website features	-0.25	0	Role-based access control (Admin, Waiter, Kitchen Staff, Customer)
	Forgot password by email	-0.25	0	Password reset via email link

ID	Features	Grade		Notes
4	**Features for logged-in users (Customers)**			
	Update user profile	-0.25	0	Customer can update name, preferences
	Verify user input	-0.25	0	Input validation on profile updates
	Update the user's avatar	-0.25	0	Profile photo upload
	Update password	-0.25	0	Change password with old password verification
	Order history and tracking			
	› View order history	-0.25	0	List of past orders linked to user account
	› View item processing status	-0.25	0	Track individual item status within an order (Queued, Cooking, Ready)
	› Real-time Order Updates	-0.5	0	WebSocket-based live order status updates for customers
5	**Administration features (Restaurant Admin)**			
	Create Admin accounts	-0.25	0	Admin creates additional Admin accounts
	Manage Admin accounts	-0.25	0	View, edit, deactivate Admin accounts
	Update admin profile	-0.25	0	Restaurant admin profile management
	Create Waiter accounts	-0.25	0	Admin creates accounts for waiters
	Create Kitchen Staff accounts	-0.25		Admin creates accounts for kitchen staff
	Manage menu categories	-0.25	0	Create, edit, delete food categories

ID	Features	Grade		Notes
	View menu item list	-0.5	0	List all menu items with filters and pagination
	Filter menu items by name, category	-0.25	0	Search and filter menu items
	Sort menu items by creation time, price, popularity	-0.25	0	Sortable menu item list
	Create a new menu item	-0.25	0	Add item with name, price, description, category, prep time
	Upload multiple menu item photos	-0.5	0	Multi-image upload for menu items
	Add menu item to category with modifiers	-0.25	0	Assign categories and create modifier groups (Size, Extras)
	Menu Item Modifiers	-0.5	0	Modifier groups (Size, Extras) with price adjustments
	Specify menu item status	-0.25	0	Available, Unavailable, Sold out
	Verify user input	-0.25	0	Input validation for menu items
	Update a menu item	-0.25	0	Edit existing menu items
	Add, remove menu item photos	-0.25	0	Manage item images
	Change menu item category, modifiers	-0.25	0	Update item categorization
	Update menu item status	-0.25	0	Toggle availability
	Verify user input	-0.25	0	Validation on updates
	Customer orders (Order Management)			

ID	Features	Grade		Notes
	› View list of orders sorted by creation time	-0.25	0	Order list in KDS sorted by time
	› Filter orders by status	-0.25	0	Filter: Received, Preparing, Ready, Completed
	› View order details	-0.25	0	Full order details with items, modifiers, notes
	› Update order status	-0.25	0	Progress order through states: Received → Preparing → Ready → Completed
	› Kitchen Display System (KDS)	-0.5	0	Real-time order display for kitchen staff with sound notifications
	› Order Timer and Alerts	-0.25	0	Highlight orders exceeding item's configured prep time
	Table Management			
	› Create, edit, deactivate tables	-0.5	0	Create, edit, deactivate tables with capacity and location
	› QR Code Generation	-0.5	0	Generate unique QR codes per table with signed tokens
	› QR Code Download/Print	-0.25	0	Download QR as PNG/PDF for printing
	› QR Code Regeneration	-0.25	0	Regenerate QR and invalidate old codes
	Reports			
	› View revenue report in time range	-0.25	0	Daily, weekly, monthly revenue reports
	› View top revenue by menu item in time range	-0.25	0	Best-selling items report
	› Show interactive chart in reports	-0.25	0	Chart.js/Recharts for analytics dashboard (orders/day, peak hours, popular items)
7	**Waiter features**			

ID	Features	Grade		Notes
	View pending orders	-0.25	0	List of new orders waiting for waiter acceptance
	Accept/Reject order items	-0.25	0	Waiter can accept or reject individual order items
	Send orders to kitchen	-0.25	0	Forward accepted orders to Kitchen Display System
	View assigned tables	-0.25	0	See tables assigned to the waiter
	Mark orders as served	-0.25	0	Update order status when food is delivered to table
	Bill Management			
	› Create bill for table	-0.25	0	Generate bill with all order items, subtotal, tax, and total
	› Print bill	-0.25	0	Print bill to thermal printer or download as PDF
	› Apply discounts	-0.25	0	Apply percentage or fixed amount discounts to bill
	› Process payment	-0.25	0	Mark bill as paid (cash, card, or e-wallet)
8	**Advanced features**			
	Payment system integration	0.5	0.5	Payment gateway integration (ZaloPay, MoMo, VNPay, Stripe, etc.) - at least 1 required
	Fuzzy search	0.25	0.25	Fuzzy matching for menu item search with typo tolerance
	Use memory cache to boost performance	0.25	0	Redis for menu caching and session management
	Analyze and track user actions	0.25	0	Google Analytics for QR scan tracking, order conversion metrics
	Dockerize your project	0.25	0.25	Docker containers for backend, frontend, database
	CI/CD	0.25	0	GitHub Actions for automated testing and deployment
	Monitoring and logging	0.25	0	Centralized application logs, metrics, dashboards, and alerting (e.g., ELK/EFK, Prometheus/Grafana)

ID	Features	Grade		Notes
	BI integration	0.25	0	Connect operational data to BI tools for reporting and dashboards (e.g., Power BI, Tableau, Metabase)
	Advanced authorization (RBAC)	0.25	0	Fine-grained role/permission management for Admin/Chef/Waiter and other staff roles
	WebSocket real-time updates	0.5	0.5	Socket.IO for real-time features: KDS order notifications, customer order status tracking, waiter new order alerts, kitchen ready notifications, table status updates
	Multi-tenant support	0.5	0	Multiple restaurants (tenants) with strict data isolation; tenant-scoped RBAC and configuration
	Multilingual support	0.25	0.25	i18n for English/Vietnamese language selection

3. TỔNG KẾT ĐIỂM (FINAL PROJECT GRADE)

3.1. Tính điểm chi tiết theo category

Category	Max Points	Self-Evaluation	Percentage
Overall Requirements	28	28	100%
Guest Features (Customer Ordering)	6.25	6.25	100%
Authentication and Authorization	2.75	2.75	100%
Features for Logged-in Users	2	2	100%
Administration Features	9.75	9.75	100%
Waiter Features	2.25	2.25	100%
Advanced Features (Required)	3.75	1.75	46.7%
TOTAL	**54.75**	**52.75**	**96.35%**

3.2. Advanced Features - Chi tiết

Feature	Point	SE*	Status	Evidence
Payment system integration (Stripe)	0.5	0.5	☑	Stripe SDK integration với PaymentIntent API
Fuzzy search	0.25	0.25	☑	Fuse.js cho menu search với typo tolerance
Memory cache (Redis)	0.25	0	✖	Chưa implement
User action tracking (Analytics)	0.25	0	✖	Chưa có Google Analytics
Dockerize project	0.25	0.25	☑	docker-compose.prod.yml cho production

Feature	Point	SE*	Status	Evidence
CI/CD	0.25	0	✘	Chưa setup GitHub Actions
Monitoring and logging	0.25	0	✘	Chưa có ELK/Prometheus
BI integration	0.25	0	✘	Chưa có Power BI/Tableau
Advanced RBAC	0.25	0	✘	Có basic role-based, chưa fine-grained
WebSocket real-time	0.5	0.5	☑	Socket.IO cho KDS, waiter alerts, order tracking
Multi-tenant support	0.5	0	✘	Single-restaurant system
Multilingual support	0.25	0.25	☑	i18n EN/VI với LanguageSwitcher
Total	**3.75**	**1.75**		

3.3. Bonus Features (Tính năng nâng cao thêm)

Feature	Bonus Points	Evidence
Loyalty Points System	+0.25	Automatic earning, tiers (Bronze/Silver/Gold/Platinum), vouchers, points history, redemption
Inventory Management System	+0.25	Stock tracking, low stock alerts, auto-deduction on order completion, restock management
Table Reservation System	+0.25	Booking, overlap detection, status management (Pending/Confirmed/Cancelled/Completed/No-Show)
Total Bonus	**+0.75**	

3.4. ĐIỂM CUỐI CÙNG

```
┌─────────────────────────────────────────────────────────┐
│                  FINAL PROJECT GRADE                      │
├─────────────────────────────────────────────────────────┤
│                                                           │
│   Base Score (All Required Features)   :    54.75 điểm    │
│   Advanced Features Missing            :    -2.00 điểm    │
│                                                           │
│   Bonus Features Added:                                   │
│     • Loyalty Points System            :    +0.25 điểm    │
│     • Inventory Management             :    +0.25 điểm    │
│     • Table Reservation                :    +0.25 điểm    │
│                                                           │
│   ─────────────────────────────────────────────          │
│                                                           │
│   TOTAL SELF-EVALUATION SCORE          :    53.5 điểm     │
```

```
│                                                                     │
│   MAX POINTS                          :      54.75 điểm             │
│                                                                     │
│   PERCENTAGE                          :      97.71%                 │
│                                                                     │
```

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4. PHÂN TÍCH ĐIỂM MẠNH VÀ ĐIỂM YẾU

4.1. Điểm mạnh

- ☑ **Tính năng đầy đủ:** Đã implement 100% các tính năng yêu cầu cơ bản
- ☑ **Advanced features:** 3 tính năng nâng cao bonus (Loyalty, Inventory, Reservations)
- ☑ **Code quality:** Code sạch, có documentation, tuân thủ best practices
- ☑ **UI/UX tốt:** Responsive design, multi-language support (EN/VI)
- ☑ **Real-time:** Socket.IO cho live updates trên tất cả dashboards
- ☑ **Payment integration:** Stripe với đầy đủ flow thanh toán
- ☑ **Docker:** Containerization hoàn chỉnh cho production
- ☑ **Documentation:** README, Reports, API docs đầy đủ
- ☑ **Git workflow:** 231 commits, 23 PRs với code review
- ☑ **Demo video:** Có video demo đầy đủ các tính năng
- ☑ **Public hosting:** Đã deploy lên hosting công khai

4.2. Điểm yếu

- ✖ **Redis caching:** Chưa implement memory cache
- ✖ **CI/CD:** Chưa setup GitHub Actions
- ✖ **Monitoring:** Chưa có hệ thống monitoring (ELK/Prometheus)
- ✖ **Analytics:** Chưa có Google Analytics integration
- ✖ **BI integration:** Chưa có Power BI/Tableau connection
- ✖ **Multi-tenant:** Chỉ hỗ trợ single restaurant

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5. PROJECT SUMMARY

5.1. System Overview

Smart Restaurant is a QR-based menu ordering system for **dine-in service** that enables restaurants to:

- Manage digital menus with categories, items, and modifiers
- Generate unique QR codes for each table
- Allow customers to scan QR, browse menu, and place orders from their phones
- Customers can add items to their current order during their visit (single order per table session)
- Process payments after the meal via Stripe payment gateway
- Track orders in real-time via Kitchen Display System (KDS)
- View analytics and performance reports

5.2. Technology Stack

Layer	Technologies
Frontend	Next.js 14, TypeScript, Tailwind CSS, Zustand
Backend	NestJS, Prisma ORM, PostgreSQL, Socket.IO
Auth	JWT, Passport.js, Google OAuth, bcrypt
Payment	Stripe SDK
Storage	Cloudinary (images)
DevOps	Docker, Docker Compose
UI/UX	Lucide Icons, Recharts, react-to-print, Fuse.js

5.3. Key User Flows

1. **Restaurant Setup:** Admin account creation → Admin login → Menu Creation → Table Setup → QR Generation
2. **Customer Registration:** Sign up → Email Verification → Login → Access order history
3. **Customer Ordering (Dine-in):** Scan QR → View Menu → Add to Cart → Submit Items → Track Order → Add More Items → Request Bill → Payment
4. **Waiter Order Acceptance:** Customer Places Order → Waiter Receives Notification → Waiter Reviews → Accept/Reject → Send to Kitchen
5. **Order Processing (Kitchen):** Waiter Accepts Order → Kitchen Receives → Preparing → Ready → Waiter Serves → Completed

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6. KẾT LUẬN

Dự án Smart Restaurant đã được hoàn thành với chất lượng cao, đáp ứng **100% các yêu cầu cơ bản** và có thêm **3 tính năng nâng cao** (Loyalty Points, Inventory Management, Table Reservations).

Điểm tự đánh giá: 53.5/54.75 điểm ~ 97.71%

Chất lượng dự án: ⭐ ⭐ ⭐ ⭐ ⭐ (5/5 sao)

Thành viên nhóm: Phạm Hữu Đan, Trần Đại Hiệp, Lâm Hoàng Vũ