CONCEPT STUDY · INTERACTIVE PROTOTYPE

TableReady: Order-ahead and dining experience with dynamic kitchen queue throttling and live inventory protection.

Dynamic kitchen load throttling and sold-out modifier handling. Preparation estimates calculate dynamically based on active ticket count and prep complexity, warning guests of surge delays before payment and locking out depleted modifiers in real-time.

INDUSTRY VERTICAL
Hospitality & Member Services

DOMAIN SECTOR
Food & Hospitality Operations

PROTOTYPE STACK
Next.js / TypeScript

TARGET PRODUCTION RUNTIME
Flutter

Executive Summary

Liam, an office worker on a 30-minute lunch break, orders a specialty panini from a popular downtown bistro. During noon rush, the kitchen queue swells from 4 tickets to 22 tickets, but standard food apps continue displaying static 15-minute pickup promises.

Static preparation estimates cause customer frustration when orders take 40 minutes instead of 15, while simultaneously overwhelming kitchen staff with impossible throughput expectations.

Operational Hurdles & The Failure of Conventional Approaches

In real-world mobile deployments within Hospitality & Member Services, applications encounter operational friction that desktop web portals never face.

Core Engineering Challenges Addressed:

1. Operational Bottleneck: Static preparation estimates cause customer frustration when orders take 40 minutes instead of 15, while simultaneously overwhelming kitchen staff with impossible throughput expectations.

2. Data Integrity Risk: Traditional approaches rely on synchronous network calls that fail under unstable cellular handoffs or high concurrency.

3. User Experience Impact: Frustration occurs when users lose in-progress work or receive misleading feedback from unbuffered user interfaces.

Dynamic kitchen load throttling and sold-out modifier handling. Preparation estimates calculate dynamically based on active ticket count and prep complexity, warning guests of surge delays before payment and locking out depleted modifiers in real-time.

Architectural Solution & Interface Design

Demonstrated UX & Architecture Decision:

Dynamic kitchen load throttling and sold-out modifier handling. Preparation estimates calculate dynamically based on active ticket count and prep complexity, warning guests of surge delays before payment and locking out depleted modifiers in real-time.

Principal Interface Screens (5 Views):

1. **Live Bistro Menu**
   Curated dishes with real-time stock availability badges and dietary filters.
2. **Modifier Customizer**
   Ingredient additions and allergen swaps with instant inventory validation.
3. **Smart Order Bag**
   Transparent itemization with dynamic kitchen queue estimate banner.
4. **Order Preparation Tracker**
   Visual status steps: Received → Prepping → Fired → Ready for Counter Pickup.
5. **Kitchen Display Simulator**
   Staff view showing active ticket queue and capacity throttle controls.

Interactive Journey: Kitchen Surge Throttling & Live Order Tracking

Select meal → Customize modifiers → Observe surge queue increase → Review adjusted pickup time → Place order → Monitor live ticket prep.

1. Open TableReady bistro lunch menu
2. Select "Truffle Chicken Panini" and open modifier drawer
3. Observe live inventory check disabling "Gluten-Free Ciabatta" (depleted)
4. Select "Focaccia" alternative and add to bag
5. Simulate kitchen peak rush (queue increases from 5 to 18 active tickets)
6. Observe prep estimate dynamically recalculate from 12m to 28m with clear warning

Reset Mechanism: One-click reset to normal kitchen capacity with full stock inventory.

Handled Edge Cases & Exception Recovery

Edge Condition #1:
Kitchen surge alert automatically expanding pickup window by +15 minutes before checkout

Edge Condition #2:
Modifier stockout toast triggering immediate alternative suggestion without clearing meal selections

Edge Condition #3:
Kitchen closing cutoff countdown preventing orders placed within 10 minutes of fryer shutdown

Actual Prototype vs. Target Native Production Runtime

Actual Prototype Stack

Platform & Framework:

`Next.js / TypeScript`

Languages:

`TypeScript, Tailwind CSS`

Interactive bistro ordering simulator with live kitchen load slider and dynamic wait recalculation.

Target Production Stack

Platform & Framework:

`Flutter`

Languages & Storage:

`Dart, Cloud Pub/Sub, Stripe Terminal`

Unified POS and guest mobile codebase, high-performance rendering for dense menus, and hardware printer integration.

Explicit Prototype Boundaries & Validation Methodology

Documented Prototype Limitations:

- Simulated in browser using mathematical queuing algorithms; does not interface with physical kitchen receipt thermal printers.
- Payment processing simulated without live PCI DSS terminal card reader handshakes.

Target Production Telemetry:

Monitor average customer wait time on premise during peak lunch hours across 30 bistro locations.

Commercial Offer Alignment & Handover Guarantees

This technical concept study directly demonstrates the design, state-machine architecture, and resilience engineering delivered under FFNA Solutions' fixed-scope programs:

Product Prototype Sprint

2-week fixed sprint delivering high-fidelity interactive simulation with edge recovery.

Mobile MVP Launch

6–8 week end-to-end production build with backend API, store release, and full IP transfer.

Handover Guarantee

100% intellectual property ownership transferred upon milestone completion. Comprehensive technical documentation, architecture runbooks, and zero vendor lock-in.