CONCEPT STUDY · INTERACTIVE PROTOTYPE

QueueEase: Virtual queue management for public service centers with honest uncertainty intervals and private call-ups.

Honest uncertainty intervals and privacy-preserving token call-ups. Instead of misleading single-minute predictions, QueueEase presents a realistic wait range (e.g. "25–35 min") updated in real-time, with a "Step Out / Hold My Spot" deferral feature that pauses the token without dropping to the bottom.

INDUSTRY VERTICAL
Hospitality & Member Services

DOMAIN SECTOR
Civic & Public Service Operations

PROTOTYPE STACK
Next.js / TypeScript

TARGET PRODUCTION RUNTIME
React Native / Expo

Executive Summary

Jordan visits a municipal licensing center for a vehicle registration renewal. The waiting room is packed with 80 people, noisy public address speakers, and an uninformative paper ticket reading "#B-114" with no clue whether the wait is 20 minutes or 3 hours.

Physical waiting rooms create stress, waste citizen time, and generate high abandon rates because paper ticket systems provide zero progress feedback and punish anyone who steps out for a coffee.

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: Physical waiting rooms create stress, waste citizen time, and generate high abandon rates because paper ticket systems provide zero progress feedback and punish anyone who steps out for a coffee.

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.

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Architectural Solution & Interface Design

Demonstrated UX & Architecture Decision:

Honest uncertainty intervals and privacy-preserving token call-ups. Instead of misleading single-minute predictions, QueueEase presents a realistic wait range (e.g. "25–35 min") updated in real-time, with a "Step Out / Hold My Spot" deferral feature that pauses the token without dropping to the bottom.

Principal Interface Screens (5 Views):

1. **Service Directory**
   Department selection (Licenses, Permits, Vital Records) with live queue depths.
2. **Digital Queue Pass**
   Anonymous token badge (#B-114), current position, and dynamic wait interval.
3. **Step-Out & Deferral Sheet**
   Option to pause position for 10 or 15 minutes to run an errand.
4. **Counter Call-Up Alert**
   High-contrast prompt instructing citizen to proceed to Desk 4.
5. **Staff Counter Simulator**
   Clerk dashboard showing waiting citizens, call-up triggers, and no-show recovery.

Interactive Journey: Virtual Queue Entry to Counter Verification

Select service → Receive digital token → Step out for 10m deferral → Observe queue movement → Receive call-up alert → Verify at desk.

1. Open QueueEase municipal service directory
2. Select "Driver License Renewal" and tap "Join Virtual Line"
3. Receive anonymous token #B-114 with estimated wait: 20–30 minutes
4. Tap "Step Out (10 min)" to walk to nearby cafe without losing position
5. Simulate clerk advancing 3 tickets ahead
6. Receive vibrating call-up notification: "Desk 4 is Ready for Token #B-114"

Reset Mechanism: One-click reset to initial empty queue selection.

Handled Edge Cases & Exception Recovery

Edge Condition #1:
Sudden complex case delay at counter automatically adjusting remaining queue estimates with explanatory notice

Edge Condition #2:
Missed call-up 5-minute grace window preserving priority before final ticket cancellation

Edge Condition #3:
Accidental queue abandonment confirmation modal preventing unintentional token loss

Actual Prototype vs. Target Native Production Runtime

Actual Prototype Stack

Platform & Framework:

Next.js / TypeScript

Languages:

TypeScript, Tailwind CSS

Virtual queue state machine with simulated ticket advancement and token deferral.

Target Production Stack

Platform & Framework:

React Native / Expo

Languages & Storage:

TypeScript, WebSocket, OneSignal Push

Broad device support for diverse public demographics, background push wakeups, and high accessibility.

Explicit Prototype Boundaries & Validation Methodology

Documented Prototype Limitations:

- Simulated in browser using local interval counters without municipal backend mainframe interfaces.
- SMS text-messaging fallbacks simulated in-app without Twilio carrier routing.

Target Production Telemetry:

Survey citizen satisfaction ratings and counter throughput efficiency across 5 municipal branches.

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.