

Maker Inventory & Orders — Product Spec (Portfolio-Ready)

Last updated: 5 Sep 2025

0) Product Overview

A mobile-first Flutter app (with tablet-friendly layout) for small makers/workshops to track stock, BOMs, and customer orders end-to-end. Backend is Firebase (Auth, Firestore, Storage, Cloud Functions, FCM). Target users: solo makers to small teams (1–20 staff).

Goals

- **MVP (4–6 weeks):** Item & stock tracking, simple BOMs, order intake, status tracking, low-stock alerts.
 - **Portfolio win:** Clean architecture, real-time sync, robust offline UX, testable modules, and polished UI.
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1) Personas

- **Owner/Maker (Admin):** Creates items/BOMs, manages pricing, oversees orders & inventory.
 - **Staff (Ops):** Picks/receives stock, updates order progress, prints/exports documents.
 - **Wholesale Client (Optional, later):** Places B2B orders from a curated catalog.
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2) User Stories (by Epic)

A) Authentication & Accounts

- As a user, I can sign in with email/password or Google so I can access my workspace.
- As a user with multiple shops, I can switch workspace/brand.
- As an admin, I can assign roles (Admin, Staff, Read-only).

B) Catalog (Items & Variants)

- As an admin, I can create items with SKU, photos, unit, cost/price, tags, variants, barcode.
- As an admin, I can batch import items with CSV.
- As a staff, I can search & filter items quickly by tag, status, supplier, or low-stock.

C) Inventory & Stock

- As a staff, I can adjust stock with reasons (damaged, correction).
- As an admin, I can manage stock per location (Main, Shelf A, Van).
- As a staff, I can receive stock and generate picklists for orders.

- As a user, I want low-stock alerts when items fall below thresholds.

D) BOMs (Bills of Materials)

- As a maker, I can define BOMs by adding component materials.
- As staff, I can trigger builds that consume BOM components and increment finished goods.

E) Orders (Sales Orders)

- As a user, I can create orders with customer, due date, priority, lines (items, qty, price).
- As a staff, I can track order statuses (Draft → Confirmed → In Production → Ready → Shipped).
- As a user, I can export order summary/picklist as PDF.

F) Customers & Suppliers

- As an admin, I can maintain customer and supplier contact info.
- As an admin, I can assign default suppliers to items.

G) Notifications & Activity

- As a user, I receive push notifications for low stock, due orders, and build completions.
- As an admin, I can review activity logs of who did what and when.

H) Reporting

- As a user, I can see KPIs like open orders, orders due this week, and items low on stock.
- As an admin, I can see simple inventory value = qty × last cost.

I) Settings

- Workspace profile, currency, tax rate, units, default thresholds, roles, and locations.
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3) Requirements

Functional (MVP)

- Auth with role-based access.
- CRUD for items, stock, BOMs, orders, customers.
- Stock movement tracking with reasons & history.
- Real-time sync with Firestore snapshots.
- Offline-first writes with retries.
- Export orders as PDF and import items as CSV.

Non-Functional

- **Performance:** <300ms for list filters (≤5k items).
- **Reliability:** Idempotent writes, retries on failure.
- **Security:** Firebase Rules, server timestamps.

- **Scalability:** Collections per workspace, proper indexes.
- **Testability:** Unit tests, widget tests, integration with emulator.
- **Analytics:** Key events and screen views.

Out of Scope (MVP)

- Payments gateway, advanced purchasing, multi-currency, Shopify sync.
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4) Information Architecture

- Tabs: Dashboard · Orders · Inventory · Build · Contacts · Settings
 - FAB for contextual quick actions.
 - Search in dashboard & list views.
 - Status chips with colors.
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5) UI/UX Design

Screens

- **Dashboard:** KPIs, recent activity, quick actions.
- **Orders:** Status tabs, detail view with timeline, documents.
- **Inventory:** List with low-stock badges, item detail with stock by location, BOM, history.
- **Build Jobs:** List and detail view with required components and availability.
- **Contacts:** Customers and suppliers with quick call/email.
- **Settings:** Org profile, roles, locations, thresholds.

Color Palette

- Primary: Indigo 500
- Accent: Emerald 500 (success), Amber 500 (warning), Rose 500 (danger)
- Background: Dark Gray 900 / Light Gray 50
- Status chips: Draft (Gray), Confirmed (Indigo), In Production (Blue), Ready (Green), Shipped (Purple), Cancelled (Red)

Typography

- Headline: Inter Semi-Bold
- Body: Inter Regular
- Numeric: Tabular figures for stock/price

Components

- AppBar with workspace switcher
- Rounded cards (16–20px radius)
- Status chips with icons

- List items with metadata (SKU, qty, location)
- Empty state illustrations + CTA
- FAB for add/adjust/build

Motion

- Smooth 150–250ms transitions
- Micro animations on chips and stock adjustments

Accessibility

- WCAG contrast ($\geq 4.5:1$)
 - Scalable text
 - Tap targets $\geq 44\text{px}$
 - Screen reader labels
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6) Key Flows

Flow 1: Create Order

1. Dashboard → New Order
2. Pick customer & due date
3. Add items, show stock & warnings
4. Confirm totals → save as Confirmed
5. Auto-generate picklist, log activity

Flow 2: Build from BOM

1. Inventory → Item → Start Build
2. Show required vs available components
3. Reserve/consume → Complete Build
4. Auto-update stock, log event

Flow 3: Low-Stock Alert

1. See low-stock banner → view items
 2. Select multiple → export supplier list
 3. Share via email/WhatsApp
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7) MVP vs Stretch

- **MVP:** Auth, items/stock, BOMs, orders, build jobs, low-stock alerts
 - **Stretch:** Purchase orders, barcode scanning, label printing, tiered pricing, multi-currency
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8) Firestore Sketch

```
/workspaces/{ws}  
  /users/{uid} → role, profile  
  /items/{itemId}  
    /variants/{variantId}  
    /stock/{locId}  
    /bom/{componentId}  
    /movements/{moveId}  
/orders/{orderId}  
  /lines/{lineId}  
/customers/{custId}  
/suppliers/{supId}  
/activities/{actId}  
/settings
```