GenERP BD

Complete Technical & Product Documentation

Generalised Cloud ERP / SaaS Platform for Bangladesh

MVP Development Plan | Version 1.0 | 2026

Stack	Laravel 12 + Filament v4 + MySQL
Timeline	20 Weeks (Solo + AI-Assisted)
Model	Freemium (3 companies free, unlimited paid)
Language	Bangla (primary) + English bilingual

1. Project Overview

1.1 What is GenERP BD?

GenERP BD is a generalised cloud-based ERP (Enterprise Resource Planning) SaaS platform built specifically for the Bangladeshi market. It is designed to serve any kind of business — from a 1-person freelancer to a 1,000-employee RMG factory — using a single, flexible application that each business customises to match their own workflows, policies, and operations.

The core philosophy is: one application, infinite configurations. Rather than building separate products for a pharmacy, a garments factory, and a retail shop, GenERP BD provides a powerful dynamic layer that lets each business shape the application to their needs — without writing a single line of code.

1.2 Target Businesses

GenERP BD is designed to serve all of the following business types out of the box:

- Retail shops and supermarkets
- Pharmacies and drug stores
- Wholesale and trading companies
- Manufacturing companies and RMG / garments factories
- Restaurants and food businesses
- Service businesses (IT, consulting, agencies, clinics)
- Solo entrepreneurs and freelancers
- NGOs and non-profit organisations
- Government offices and institutions
- E-commerce businesses
- Schools, coaching centres, and educational institutions

1.3 Key Differentiators

What makes GenERP BD different from existing ERP products available in Bangladesh:

Differentiator	Description
One login, many businesses	A single user account manages unlimited companies and branches, with role-based access per company
Truly generalised	Every form, list, dashboard, report, workflow, and alert is configurable per company — not hardcoded for one industry
Dynamic workflow engine	Each business defines their own approval chains, document statuses, and automation rules

Custom fields on everything	Add any field to any entity (product, invoice, employee, customer) without developer help
Bangla-first UI	Full bilingual interface with Bangla as the default language, including Bengali numerals in invoices and reports
Freemium model	Free tier supports up to 3 companies — ideal for small businesses to start without cost
Business type templates	Onboarding presets for each business type auto-configure fields, workflows, and modules from day one
AI-ready architecture	Built for future AI insights and automation features once revenue is generated post-MVP

2. Business Model

2.1 Subscription Plans

Feature	Free	Pro	Enterprise
Price	Free forever	~3,000–4,000 BDT/month	~10,000+ BDT/month
Companies/Branches	Up to 3 companies	Unlimited	Unlimited + custom domain
Users per company	3 users per company	Unlimited	Unlimited + advanced roles
Modules	Core modules only	All 11 MVP modules	All + API access
Products/SKUs	500 max	Unlimited	Unlimited
Custom Fields	5 per entity	Unlimited	Unlimited
Workflow Builder	Basic (3 statuses)	Full builder	Full + automation
Reports	Basic only	Full + scheduled exports	Drill-down + custom builder
PDF Invoices	Watermarked	Clean branded	Custom branding per company
Dashboard Widgets	5 widgets	Unlimited	Unlimited + custom
Storage	1 GB	Unlimited	Unlimited + dedicated option
Notifications	In-app only	In-app + email	In-app + email + SMS
Audit Log	Last 30 days	Full history	Full history + export
Support	Community / forum	Priority email	Dedicated + phone
Payment Integration	None	bKash, Nagad recording	Full gateway integration

2.2 Subscription Billing

Subscription payments will be integrated in Phase 10 of development (Week 15), after the core product is built and validated. Payment methods to support at launch: SSLCommerz (card payments), bKash Business (most common for BD businesses), and manual bank transfer with admin confirmation. Stripe can be added later for international clients.

Plan enforcement is handled via middleware that checks the user's active subscription on every request. Downgrading or expiry triggers a grace period of 7 days before features are restricted. Free tier limits are enforced permanently and cannot be bypassed.

3. Technical Architecture

3.1 Tech Stack

Layer	Technology	Reason
Backend Framework	Laravel 12 (monolithic)	Excellent for AI-assisted generation, built-in queues, events, notifications, API
Database	MySQL 8 (UTF8mb4_unicode_ci)	Full Bangla character support, JSON columns, mature and reliable
Cache / Queues	Redis + Laravel Horizon	Fast caching for dashboards/reports, reliable queue processing
Admin UI	FilamentPHP v4	Beautiful, responsive, ready-made datatables, forms, charts — best for solo developers
Charts	Filament Charts + ApexCharts	Native integration, beautiful visualisations
Real-time	Laravel Reverb + Echo	Official Laravel WebSockets, zero extra cost, native integration
Authentication	Laravel Sanctum + Spatie Permission	API tokens + full RBAC (roles and permissions per company)
Multi-tenancy	stancl/tenancy (shared DB + tenant_id)	Scalable, simpler ops than multi-DB, works with Filament
Testing	Pest + Laravel Dusk	Fast, expressive, excellent for AI-generated tests
Bilingual	Laravel Localization (lang/bn + lang/en)	Full Bangla/English switch, per-company preference
Fonts	Noto Sans Bengali (CDN)	Best Bangla web font, Google Fonts CDN
File Storage	Laravel Storage + S3-compatible	Local for MVP, S3/object storage for scale
AI Dev Tools	Cursor.sh + Claude 4 + GitHub Copilot	Best combo for Laravel + Filament in 2026
Hosting (MVP)	XeonBD / Alpha Net VPS	Bangladesh-based, fast local latency, affordable start

3.2 Multi-Tenancy Model

GenERP BD uses a shared database with tenant_id scoping (via stancl/tenancy). Every table that holds business data has a company_id (tenant_id) column. A global Eloquent scope automatically filters all queries by the active company, preventing data leakage between companies.

User to company relationship is many-to-many via a pivot table. A single user can own or be a member of multiple companies, with different roles in each. When a user logs in, they select their active company (or are auto-directed to their last active one). The company switcher in the navigation lets them jump between companies instantly.

3.3 Core Database Tables (Foundation)

Table	Purpose
users	Central user accounts — one account per person, used across all companies
companies	Each business registered in the system, with settings, plan, and branding
branches	Outlets or locations under a company (head office, branch 1, warehouse, etc.)
company_user (pivot)	Many-to-many: which users belong to which company, with their role
plans	Free, Pro, Enterprise plan definitions with all feature limits
subscriptions	Active subscription per company, with expiry, payment status, grace period
roles / permissions	Spatie permission tables, scoped per company
custom_field_definitions	User-defined fields per entity per company (field name, type, options, required)
custom_field_values	Stored values for custom fields (or JSON column on entity)
workflow_definitions	Status machine configs per document type per company
workflow_transitions	Allowed transitions, required roles, automation triggers
audit_logs	Full activity log: who did what, on which record, when
notifications	In-app notifications per user
alert_rules	User-configured trigger conditions and notification targets

4. The Dynamic Configuration Layer

This is the most important architectural section. The dynamic layer is what makes GenERP BD a truly generalised ERP — one codebase that serves any business type without custom development.

4.1 Business Type Templates (Onboarding)

When a user creates a new company in GenERP BD, they select their business type from a predefined list. This selection is a configuration preset — not a separate product or codebase. The following business types are supported at MVP launch:

Business Type	Auto-configured Modules	Key Preset Fields / Workflows
Retail Shop	Inventory, POS, Sales, Purchases, Expenses, Reports	Barcode on products, fast POS, daily sales dashboard
Pharmacy / Drug Store	Inventory, POS, Sales, Purchases, Batch/Expiry, Reports	Batch no., expiry date, generic name, drug license flag, expiry alerts at 30/60/90 days
Wholesale / Trading	Inventory, Sales, Purchases, Accounting, Reports	Bulk pricing tiers, credit terms on customers, LC number on purchases
Manufacturing / RMG	Inventory, Production, Sales, Purchases, HR, Payroll, Reports	Style no., buyer, LC no., shipment date, production line workflow, per-piece payroll option
Restaurant / Food	POS, Inventory (as menu), Sales, Expenses, Reports	Table/seat field, shift-based POS, daily cover report
Service Business	CRM (Clients), Sales (as projects), Expenses, HR, Reports	Project name, deliverable deadline, service category on invoices
Solo Entrepreneur	Income/Expense, Invoicing, Basic Reports	Minimal UI — just income, expense, invoice to clients
NGO / Non-Profit	Donors (as customers), Projects, Expenses, HR, Reports	Donor type, project code on expenses, fund utilisation report
Government / Institution	Purchases, Expenses, HR, Payroll, Reports	Multi-level approval workflow on purchases, budget head on expenses
School / Education	Students (as customers), Fees (as invoices), HR, Payroll, Reports	Grade, section, guardian name, admission number, fee head categories

After applying the template, the user can modify any setting. The template is a starting point, not a restriction.

4.2 Dynamic Custom Fields Engine

Every major entity in GenERP BD supports user-defined custom fields, configured per company. This means a pharmacy can add Batch Number and Expiry Date to their products, while a retail shop's product form shows none of those fields. The same application, completely different experience.

Entities that support custom fields:

- Products and product categories
- Customers and suppliers
- Sales orders and invoices
- Purchase orders
- Expenses
- Employees
- Leave requests
- Production jobs (manufacturing module)

Supported field types:

Field Type	Use Case Example
Text (short)	Generic name on a pharmacy product, Style number on an RMG order
Text (long / textarea)	Product description, Notes on a purchase order
Number	Carton quantity, Commission percentage, Weight in KG
Date	Expiry date, Shipment date, Warranty expiry
Dropdown (single select)	Drug category, Fabric type, Buyer country, Payment method
Multi-select	Certifications held, Applicable sizes, Target markets
Boolean (Yes/No toggle)	Controlled substance flag, VAT applicable, Bonded warehouse
File / Document upload	Drug license scan, LC document, Employee NID scan
URL	Supplier website, Product catalogue link
Formula (calculated)	Auto-calculate commission from amount, Markup from cost price

How it works technically:

A custom_field_definitions table stores each field's name, type, target entity, whether it is required, default value, display order, and available options for dropdowns — all scoped by company_id. Values are stored either in a custom_field_values table (EAV pattern) or as a JSON column on the entity record. Filament dynamically renders these fields in forms, detail views, and list columns based on the company's configuration. Filters and exports include custom fields automatically.

4.3 Dynamic Workflow Engine

Different businesses have completely different approval chains and status flows for the same type of document. The workflow engine allows each company to define their own state machine for every document type — without any code changes.

> *Example: A small shop processes a Purchase Order as: Draft → Approved → Received → Paid. A government office processes the same document as: Purchase Request → Department Head Approval → Finance Committee Approval → Procurement Review → Ministry Sign-off → PO Issued → Goods Received → Three-Way Match Verified → Payment Released.*

What each company can configure per document type:

- What statuses exist (e.g. Draft, Pending Approval, Approved, In Production, Shipped, Closed)
- Which transitions are allowed between statuses
- Which user roles can trigger each transition
- Whether approval is required and from whom
- What happens automatically on transition: send notification, update stock, generate journal entry, trigger alert
- Parallel approval (all must approve) vs sequential (one after another)

Document types with configurable workflows:

- Purchase Orders
- Sales Orders / Invoices
- Expense Claims
- Leave Requests
- Production Jobs
- Payroll Runs
- Credit Notes / Returns

Pre-built workflow templates:

Each business type template includes sensible starter workflows. Users can modify these or build from scratch using the visual workflow builder in company settings.

4.4 Dynamic Dashboard

The dashboard is a widget-based grid. Each company configures which widgets appear, their position, and their settings. There is no fixed dashboard layout. Widgets update in real-time using Laravel Reverb WebSockets.

Core widgets available at MVP:

- Total Sales Today / This Week / This Month
- Total Purchases Today / This Month
- Cash Balance (by account or consolidated)
- Low Stock Products (count + list)
- Upcoming Expiry Alerts (pharmacy / food businesses)
- Pending Approvals (count by document type)
- Attendance Summary (today's present / absent)
- Outstanding Receivables (top customers with balance)
- Outstanding Payables (top suppliers with balance)
- Best Selling Products (this week/month)
- Pending Salary Runs
- New Customers This Month

Widget configuration:

Each widget is configurable: filter by branch, by date range, by product category, by employee department. Users can resize and rearrange widgets. A company can have the same widget multiple times with different filters (e.g. Sales widget for Branch A and Sales widget for Branch B side by side).

4.5 Dynamic Reports

Beyond the standard pre-built reports, GenERP BD includes a report builder where any authorised user can create their own report without developer help.

Report builder capabilities:

- Choose entity to report on: Products, Sales, Purchases, Employees, Expenses, etc.
- Select which fields to include — including custom fields
- Group and aggregate by any field (sum, count, average, max, min)
- Apply filters (date range, status, category, branch, any field value)
- Sort by any column
- Visualise as table, bar chart, line chart, or pie chart
- Save report as a named template for reuse
- Schedule report to run automatically (daily, weekly, monthly) and email to specified recipients
- Export to PDF or Excel

4.6 Dynamic Alerts & Notifications

Instead of hardcoded alert rules (e.g. "notify when stock below 10"), each company configures their own alert rules based on any field condition on any entity.

Alert rule structure:

- Trigger: any field on any entity reaching a condition (Stock Quantity < threshold, Expiry Date within X days, Invoice overdue by X days, Employee absent for X consecutive days, Expense amount exceeds budget limit)
- Action: notify specific roles or specific users
- Channel: in-app notification, email, SMS (SMS gateway post-MVP)
- Frequency: notify once, or repeat every X hours until resolved

Pre-configured alert rules are applied by the business type template. Pharmacies get expiry alerts at 90/60/30 days automatically. Retail shops get low stock alerts. These can all be modified or additional rules added.

4.7 Dynamic HR & Payroll

Different companies have completely different salary structures. The payroll engine supports fully configurable salary components rather than a hardcoded structure.

Configurable salary components per company:

- Earnings: Basic Salary, House Rent Allowance, Medical Allowance, Transport Allowance, Mobile Allowance, Festival Bonus, Target Bonus, Per-piece Rate (for garments factories), Commission
- Deductions: Provident Fund (configurable %), Income Tax (BD slabs, auto-calculated), Loan Repayment, Absent Deduction, Late Deduction, Advance Recovery

Each employee can have their own salary structure within the company template. The monthly payroll run calculates all components based on the configuration, generates payslips (PDF, bilingual), and produces a bank payment list for bulk transfer.

5. MVP Module List

5.1 Module Overview

All 11 modules are built with the dynamic layer (custom fields, configurable workflows, dynamic dashboard widgets, and alert rules) from day one. Every module can be enabled or disabled per company.

#	Module	Tier	Who needs it
1	Foundation & Multi-Company	All tiers	Everyone — this is the base layer
2	Products & Inventory	All tiers	Any business that holds stock
3	Purchasing & Suppliers	All tiers	Any business that buys stock or services
4	Sales & Invoicing	All tiers	Every business that sells anything
5	Expenses	All tiers	Every business
6	Basic Accounting & Ledger	All tiers	Every business needing financial overview
7	HR & Payroll	All tiers	Any business with employees
8	POS (Point of Sale)	All tiers	Retail, pharmacy, restaurant, any fast-billing business
9	Batch & Expiry Management	All tiers	Pharmacy, food, manufacturing
10	CRM (Customers)	Pro + Enterprise	Service businesses, agencies, wholesalers
11	Reports & Dashboard	All tiers (limits apply)	Everyone — core to daily operations

5.2 Module Details

Module 1: Foundation & Multi-Company

- User registration, login, password reset, email verification
- Company creation wizard with business type selection
- Branch and outlet management under each company
- Company switcher in top navigation
- User invitation and role assignment per company
- Company settings: name, logo, address, VAT/TIN, currency, language, invoice template
- Subscription plan enforcement middleware

- Module enable/disable per company
- Full audit trail: who did what, on which record, at what time
- System notifications centre

Module 2: Products & Inventory

- Product categories and subcategories (with category-level custom fields)
- Units of measurement (configurable per company)
- Products with optional variants (size, colour, grade, etc.)
- Multi-warehouse and multi-location stock management
- Stock movements: receive, issue, transfer, adjustment
- Barcode / QR code support (generate and scan)
- Low stock thresholds per product (triggers alert rules)
- Opening stock entry
- Bulk product import via Excel
- Dynamic custom fields on products and categories

Module 3: Purchasing & Suppliers

- Supplier profiles with contact, credit terms, bank details
- Purchase orders with line items (pulls from Products)
- Goods received note — stock updates automatically on approval
- Supplier payments and outstanding balance tracking
- Purchase returns with stock reversal
- Supplier ledger (full transaction history)
- Configurable purchase approval workflow per company
- Dynamic custom fields on purchase orders and suppliers

Module 4: Sales & Invoicing

- Customer profiles with contact, credit terms, balance tracking
- Quotations and sales orders
- Invoices with VAT calculation (Bangladesh rates), discounts, multi-item
- Sales returns and credit notes
- Customer payments: cash, bKash, Nagad, card, bank transfer
- Invoice PDF generation — watermarked (Free), clean branded (Pro/Enterprise)
- Overdue invoice tracking and alerts
- Customer ledger (full transaction history)
- Configurable sales approval workflow per company
- Dynamic custom fields on sales orders, invoices, and customers

Module 5: Expenses

- Expense categories (fully configurable per company)
- Expense recording with receipt / document attachment
- Configurable approval workflow (submit → manager approve → finance approve)

- Petty cash fund tracking
- Budget heads per expense category (for government / NGO)
- Expense summary reports by category, by employee, by branch
- Dynamic custom fields on expenses

Module 6: Basic Accounting & Ledger

Note: This is not a full double-entry accounting system like Tally or QuickBooks. It is a practical financial overview layer that automatically records transactions from other modules and gives the business owner a clear picture of their financial position.

- Chart of accounts (configurable: Assets, Liabilities, Income, Expenses, Equity)
- Auto journal entries generated from Sales, Purchase, and Expense modules
- Accounts receivable summary (who owes you money)
- Accounts payable summary (who you owe money to)
- Cash and bank account tracking
- Profit & Loss statement
- Balance sheet summary
- Cash flow overview
- Manual journal entry for accountants

Module 7: HR & Payroll

- Employee profiles: personal info, documents (NID, photo), emergency contact
- Departments and designations
- Attendance: manual entry, CSV import from biometric machines
- Leave types (configurable: annual, sick, casual, maternity, etc.)
- Leave request and approval workflow
- Salary structure configuration per company (fully configurable components)
- Monthly payroll run with auto-calculation of earnings, deductions, PF, income tax
- Bangladesh income tax slab calculation (auto-updated)
- Festival bonus management
- Payslip PDF generation (bilingual — Bangla and English)
- Bank payment list export (for bulk salary transfer)
- Dynamic custom fields on employees

Module 8: POS (Point of Sale)

- Dedicated fast-billing POS screen (optimised for speed, separate from standard sales)
- Product search by name, code, or barcode scan
- Cart management with quantity adjustment and item discounts
- Split payment: cash + bKash + Nagad + card in one transaction
- Receipt generation: PDF and thermal print format
- Real-time stock deduction on sale completion
- POS session management: open cash drawer, close session, end-of-day report
- Works on tablet and desktop browsers

Module 9: Batch & Expiry Management

- Batch number and lot tracking on product receive (linked to purchase)
- Expiry date tracking per batch
- FEFO (First Expiry First Out) stock issue logic
- Expiry alert rules (configurable: 90, 60, 30, 7 days before expiry)
- Expiry report: what is expiring soon, by batch, by product
- Batch traceability: see which customer received which batch (for recall scenarios)

Module 10: CRM (Customers — Pro+ only)

- Enhanced customer profiles with relationship history
- Purchase history and lifetime value per customer
- Follow-up reminders and contact log
- Customer segmentation and tagging
- Outstanding balance alerts per customer
- Customer statement PDF

Module 11: Reports & Dashboard

- Real-time KPI dashboard (widget-based, fully configurable — see Section 4.4)
- Sales report: by product, by customer, by branch, by date range, by salesperson
- Purchase report: by product, by supplier, by branch, by date range
- Inventory report: stock levels, movements, valuation, expiry list
- HR report: attendance summary, leave summary, payroll summary
- Financial report: P&L, balance sheet summary, cash flow summary
- Custom report builder (see Section 4.5)
- All reports exportable to PDF and Excel
- All heavy reports run as queued background jobs — UI never hangs
- Scheduled reports with auto-email delivery

6. Subscription Enforcement Architecture

This section defines the complete subscription layer — the data model, middleware flow, feature flag system, usage tracking, and limit boundary behaviour. Every module and every request in GenERP BD passes through this layer.

5.1 Subscription Data Model

The subscription layer is built on four core tables that work together to define what each company is allowed to do at any moment:

Table	Columns	Purpose
plans	id, name, slug (free/pro/enterprise), price_bdt, billing_cycle (monthly/yearly), features (JSON), limits (JSON), is_active	Defines what each plan includes. The features and limits columns store the complete permission and quota configuration as JSON — not hardcoded in application logic.
subscriptions	id, company_id, plan_id, status (active/grace/expired/cancelled), started_at, expires_at, grace_until, cancelled_at, payment_method, last_payment_at, next_billing_at	The active subscription per company. One company has one active subscription at a time. Status drives all enforcement decisions.
subscription_invoices	id, company_id, subscription_id, amount_bdt, status (paid/unpaid/failed), payment_ref, payment_method, paid_at, due_at	Billing history. Every subscription payment generates an invoice record for audit and receipt purposes.
usage_counters	id, company_id, metric (companies/users/products/custom_fields), current_value, last_reset_at	Real-time metered usage tracking. Incremented and decremented as resources are created or deleted. Checked against plan limits on every relevant action.

5.2 Plan Limits JSON Structure

Each plan record stores its limits and features as structured JSON. This means changing a plan's limits requires only a database update — no code deployment. Example structure for the plans.limits column:

{ "companies": 3, "users_per_company": 3, "products": 500, "custom_fields_per_entity": 5, "workflow_statuses": 3, "storage_gb": 1, "audit_log_days": 30, "dashboard_widgets": 5, "report_export": false, "scheduled_reports": false, "api_access": false, "custom_domain":

false, "white_label": false, "modules": ["inventory","sales","purchases","expenses","hr","pos","reports"] }

The Pro and Enterprise plans simply have higher numbers and more module slugs in the modules array. Adding a new limit or feature to all plans requires adding one key to each plan's JSON — no schema changes.

5.3 Middleware Flow

Every authenticated request passes through the subscription middleware stack in this order:

Order	Middleware	What it does
1	AuthenticateMiddleware	Verifies the user is logged in and their session is valid
2	SetActiveTenantMiddleware	Reads the active company from session, sets global tenant scope on all models, loads company subscription into request context
3	CheckSubscriptionStatusMiddleware	Reads subscription.status — if expired (past grace_until), redirects to /subscription/expired page. If grace period active, injects a banner warning but allows access. If cancelled, redirects to upgrade page.
4	EnforceModuleAccessMiddleware	Every Filament resource and route is tagged with a module slug (e.g. "hr", "pos", "crm"). This middleware checks if that slug exists in the company's plan modules array. If not, returns 403 with an upgrade prompt.
5	CheckFeatureFlagMiddleware	For specific feature-level actions (e.g. exporting a report, accessing the API, using custom domain), checks the relevant boolean flag in plan limits. Blocks with upgrade prompt if false.

The middleware never queries the database directly — it reads from the subscription context loaded in Step 2 and cached in Redis per company. This means zero extra database queries per request for subscription checking.

5.4 Usage Tracking & Quota Enforcement

Metered limits (companies, users, products, custom fields, storage) are tracked in real time using the usage_counters table backed by Redis atomic increments. The enforcement happens at the point of creation — not at request time.

Limit	When checked	Enforcement behaviour

Company count (3 on Free)	On "Create Company" form submit	If usage_counters.companies >= plan limit: block creation, show upgrade modal. Counter increments on company create, decrements on company delete.
Users per company	On "Invite User" action	If active user count for company >= plan limit: block invite, show upgrade modal. Counter reflects only active (non-revoked) users.
Products / SKUs (500 on Free)	On "Save Product" action	If product count >= plan limit: block save, show upgrade modal. Counter reflects active (non-archived) products only.
Custom fields per entity (5 on Free)	On "Add Custom Field" in settings	If custom field count for that entity >= plan limit: block addition, show upgrade modal.
Storage (1 GB on Free)	On every file upload	Pre-check before upload: calculate current storage used (cached, recalculated hourly). If new file would exceed limit: block upload with upgrade prompt.
Workflow statuses (3 on Free)	On workflow builder save	If status count in workflow > plan limit: block save, highlight the limit in the UI.
Audit log retention	Scheduled daily job	Runs every night. Deletes audit_logs records older than plan's audit_log_days limit for Free tier companies. Pro/Enterprise: no deletion.

5.5 Limit Boundary Behaviour

The user experience at each limit boundary is carefully designed to push toward upgrade without being hostile. GenERP BD uses a three-stage boundary system:

Stage	Threshold	What the user sees
Warning	80% of any quota reached	A subtle yellow banner appears on the relevant list page. Example: "You have used 400 of 500 products on your Free plan. Upgrade to Pro for unlimited products."
Soft block	100% of quota reached	The create/add action button is greyed out with a lock icon. Clicking it opens an upgrade modal (not an error — an invitation). Existing records are fully accessible and functional.
Hard block	Subscription expired past grace period	Read-only mode for all data. No new records can be created. No exports. A full-screen overlay on login directs to the upgrade/renewal page. Data is never deleted — it is preserved indefinitely and becomes accessible again immediately on renewal.

5.6 Grace Period & Expiry Handling

When a subscription expires (payment fails or renewal is not made), the system does not immediately restrict the company. A 7-day grace period applies:

- Day 0 (expiry): subscription.status changes from active to grace. subscription.grace_until is set to expiry + 7 days. A prominent red banner appears on every page inside the app. An email is sent to the company owner.
- Day 1–6 (grace period): full access continues. Daily reminder emails are sent. The banner escalates in urgency each day.
- Day 7 (grace end): subscription.status changes to expired. The app enters read-only mode — all data visible, no new records, no exports, no reports. A full-page upgrade prompt appears on login.
- Day 30+: data remains intact. The company's data is never auto-deleted regardless of how long the subscription remains expired. When they renew, access is restored instantly.

Data is never deleted due to non-payment. This is both the ethical approach and the better business approach — a company that returns after 6 months is a retained customer, not a lost one.

5.7 Plan Upgrade & Downgrade Flow

Upgrading a plan takes effect immediately. Downgrading takes effect at the end of the current billing cycle. The flow in each case:

Upgrade flow:

1. User clicks "Upgrade to Pro" from any upgrade prompt or from Settings > Subscription
2. Pricing page shown with monthly/yearly toggle and feature comparison
3. Payment method selection: bKash, SSLCommerz (card), or bank transfer
4. Payment processed via selected gateway
5. On payment webhook confirmation: subscription.plan_id updated, subscription.status set to active, usage_counters recalculated against new limits, Redis cache invalidated for this company, success notification sent in-app and via email
6. User is immediately redirected back to what they were doing — with the new features unlocked

Downgrade flow:

7. User selects a lower plan from Settings > Subscription
8. System checks if current usage exceeds the lower plan's limits — shows a warning list of what will be affected (e.g. "You have 8 users. Pro allows 3. You will need to remove 5 users before the downgrade takes effect.")
9. User must resolve all conflicts before downgrade is confirmed
10. Downgrade is scheduled for end of current billing period — not immediate
11. On billing period end: plan switches, limits enforced, confirmation email sent

5.8 Free Tier Permanent Restrictions

The following restrictions on the Free tier are permanent and cannot be bypassed by any action other than upgrading. They are enforced at the middleware level, not just the UI level:

- PDF invoices always have a "Generated by GenERP BD" watermark — removed only on Pro+
- Reports cannot be exported to PDF or Excel — export buttons are hidden on Free tier
- Scheduled report delivery is not available
- API access is completely blocked at the route level — 403 returned regardless of action
- The CRM module is not accessible — route returns 403
- Custom domain is not available
- Audit log is automatically pruned to last 30 days
- Dashboard is capped at 5 widgets — the widget add button is hidden after 5

5.9 Admin Subscription Management

A superadmin panel (separate from the main company panel, accessible only to GenERP BD staff) allows manual subscription management for sales and support purposes:

- Manually assign or change plan for any company (for sales deals, partnerships, special pricing)
- Extend grace period or expiry date (for clients with payment processing delays)
- View all companies, their current plan, expiry date, and usage counters
- Generate subscription invoices manually for bank transfer clients
- Suspend a company (for abuse or chargeback scenarios) — sets status to suspended, same as expired but flagged
- Unsuspend a company

7. Bilingual Implementation

6.1 Language Architecture

Bilingual support (Bangla + English) is a core requirement built into the application from Day 1 — not a later addition. The following implementation approach ensures complete coverage:

Component	Implementation
Translation files	resources/lang/bn/ and resources/lang/en/ — all strings extracted to translation keys
Default language	Bangla (bn) as system default — detected from browser Accept-Language header or user preference
Per-company setting	Each company sets their preferred language in company settings — overrides system default
Per-user setting	Individual users can override their personal language preference
Filament translation	Filament v4 built-in translation support + custom Bangla string files for all UI components
Font	Noto Sans Bengali loaded via Google Fonts CDN for all Bangla text
Database	UTF8mb4_unicode_ci on all tables — full Bangla character storage
Bangla numerals	Custom Laravel helper converts Arabic numerals to Bengali numerals (□,□,□) — toggleable per company in settings
Dates	Carbon with Bangla month names and date formatting for invoices and reports
PDF generation	PDF engine configured with Noto Sans Bengali font for Bangla text in invoices and payslips
RTL	Not required for Bangla (LTR language) — CSS structure is RTL-ready for future Arabic/Urdu support

6.2 What gets translated

Every visible string in the application is translation-keyed — including: all navigation labels, form field labels and placeholders, button text, error messages, validation messages, notification messages, email templates, PDF invoice and payslip content, report headers and labels, empty state messages, and onboarding wizard text.

8. Development Plan (20 Weeks)

This plan is designed for a solo developer using AI-assisted coding tools (Cursor + Claude 4 + GitHub Copilot). AI tools generate 70-80% of the code; developer writes architecture prompts, reviews output, fixes edge cases, and writes the 20% that requires real judgment.

7.1 Daily AI Workflow

12. Write a clear architecture prompt describing what you need to build — entity, relationships, fields, business rules
13. Ask AI to generate the migration, model, Filament resource, service class, and tests
14. Review generated code — fix business logic errors, edge cases, and BD-specific rules AI misses
15. Ask AI to write Pest tests for the new feature immediately — do not defer testing
16. Commit, deploy to staging, verify manually, repeat

7.2 Phase Breakdown

Phase 0: Environment & Architecture Setup (Week 1)

Most important phase. Every hour here saves ten hours in refactoring later. Do not skip or rush this.

- Install Laravel 12, FilamentPHP v4, MySQL 8, Redis, Laravel Horizon, Laravel Reverb
- Configure stancl/tenancy with shared DB + tenant_id global scope
- Configure Spatie Permission for RBAC
- Configure UTF8mb4_unicode_ci on database
- Set up bilingual scaffolding: lang/bn and lang/en folders, translation middleware
- Install Noto Sans Bengali font (Google CDN)
- Set up Filament professional theme (dark/light mode, custom Bangla font applied)
- Set up Pest testing framework
- Set up CI/CD pipeline (GitHub Actions → staging server auto-deploy)
- Create clean folder structure: App/Models, App/Services, App/Actions, App/Jobs, App/Policies, App/Http/Middleware
- Configure Cursor.sh rules: always use Filament v4, always add company_id scope, always use __() for strings, always write Pest tests

Deliverable: A running Laravel + Filament app accessible in the browser. Nothing more.

Phase 1: Multi-Company Core + Subscription Engine (Weeks 2–3)

- User registration, login, email verification
- Company creation wizard (step 1: business details, step 2: business type template selection, step 3: first branch setup)
- Company switcher in Filament navigation
- Branch management under each company
- Tenant-aware Eloquent scoping (every query auto-filtered by active company_id)
- Plans table and subscription model
- Freemium enforcement middleware: 3 company cap on Free, user count limits, module access restrictions
- Spatie roles and permissions per company (owner, admin, manager, staff, accountant, hr_manager, pos_cashier)
- User invitation system: invite by email, accept invite, join company with assigned role
- Company settings page: logo upload, VAT/TIN, address, language preference, Bengali numerals on/off, invoice numbering format

Deliverable: User can register, create 3 companies (free limit blocks 4th), switch between companies, invite another user, set company settings.

Phase 2: Dynamic Custom Fields + Workflow Engine (Weeks 4–5)

> *Build this before any business module. Every module will use it from day one, so it must exist first.*

- Custom field definitions UI: add/edit/delete/reorder fields per entity per company
- All field types implemented: Text, Number, Date, Dropdown, Multi-select, Boolean, File, URL, Formula
- Filament dynamic form renderer: reads custom field definitions and renders them inline in every form
- Custom field values storage (JSON column on entity OR EAV table — decide based on query performance testing)
- Custom field columns in list views (user toggles which custom fields appear as columns)
- Custom field filters in list views
- Visual workflow builder UI: add statuses, draw transitions, assign required roles, set automation actions
- Workflow state machine engine: enforces allowed transitions, runs automation on status change
- Pre-built workflow templates loaded by business type

Deliverable: Company admin can add custom fields to any entity and build a workflow for any document type — without touching code.

Phase 3: Products & Inventory (Weeks 6–7)

- Product categories and subcategories with category-level custom fields
- Units of measurement configuration
- Product creation with variants, barcode, pricing, and custom fields

- Multi-warehouse and location management
- Stock movement recording: receive, issue, transfer, adjustment
- Opening stock entry for existing businesses migrating to the system
- Low stock threshold per product — integrates with alert rules engine
- Inventory valuation (weighted average cost)
- Bulk product import from Excel template
- Inventory report: stock levels, movements log, valuation report

Deliverable: Full inventory management working with real-time stock levels and custom fields applied.

Phase 4: Purchasing & Suppliers (Week 8)

- Supplier profiles with custom fields
- Purchase orders with full workflow (configured per company)
- Goods received: partial receive supported, stock auto-updates on approval
- Supplier payments and balance tracking
- Purchase returns with stock reversal
- Supplier ledger
- Purchase reports

Deliverable: Complete purchase cycle from PO creation through goods received and supplier payment.

Phase 5: Sales & Invoicing (Weeks 9–10)

- Customer profiles with custom fields and credit terms
- Quotations and sales orders with configurable workflow
- Invoice generation with Bangladesh VAT, item discounts, invoice-level discounts
- Sales returns and credit notes
- Customer payments: cash, bKash, Nagad, card, bank transfer — partial payments supported
- Invoice PDF: watermarked for Free tier, clean branded for Pro, bilingual (Bangla + English)
- Overdue invoice tracking — integrates with alert rules
- Customer ledger
- Sales reports

Deliverable: Full sales cycle working end to end, including bilingual PDF invoices.

Phase 6: Expenses (Week 11)

- Expense categories (fully configurable)
- Expense entry with receipt attachment and custom fields
- Configurable approval workflow
- Petty cash fund tracking
- Budget head tracking (for NGOs and government offices)

- Expense reports

Deliverable: Full expense management with configurable categories and approval workflow.

Phase 7: Basic Accounting & Ledger (Week 12)

- Chart of accounts setup (configurable per company, pre-configured by business type template)
- Auto journal entries generated from sales, purchase, expense, and payment transactions
- Accounts receivable and payable summaries
- Cash and bank account tracking
- Profit & Loss statement (current month, current year, custom date range)
- Balance sheet summary
- Manual journal entry for accountants

Deliverable: Business owner can see P&L, cash position, and receivables/payables at a glance.

Phase 8: HR & Payroll (Weeks 13–14)

- Employee profiles with documents (NID, photo, contract)
- Departments, designations, reporting structure
- Attendance: manual entry and CSV import from biometric devices
- Leave types configuration and leave request/approval workflow
- Salary structure builder per company (configurable earnings and deductions)
- Monthly payroll run: auto-calculate everything from attendance, leave, and salary structure
- Bangladesh income tax auto-calculation (current BD slabs)
- PF deduction (configurable rate)
- Festival bonus management
- Payslip PDF (bilingual — Bangla + English)
- Bank payment list export for bulk salary transfer
- HR reports: attendance summary, leave balance, payroll summary

Deliverable: Complete monthly payroll cycle for a typical Bangladeshi company.

Phase 9: POS (Week 15)

- Dedicated POS screen — separate from standard invoicing, optimised for speed
- Product search by name, code, barcode scan (camera or USB scanner)
- Cart: add items, adjust quantity, item-level discount, remove items
- Split payment: cash + bKash + Nagad + card in one transaction
- Receipt generation: PDF and thermal printer format (58mm and 80mm)
- Real-time stock deduction on sale completion
- POS session management: open session, record opening cash, close session with end-of-day reconciliation
- Works on tablet and desktop browsers

Deliverable: A cashier can open POS, find products, take payment, print receipt, and close the day in under 2 minutes.

Phase 10: Batch & Expiry + CRM (Week 16)

- Batch number recording on stock receipt (linked to purchase order line)
- Expiry date per batch, FEFO stock issue logic
- Expiry alert rules integration (30/60/90 day alerts)
- Batch traceability report
- CRM module (Pro+): enhanced customer profiles, follow-up reminders, customer segmentation

Phase 11: Notifications, Alerts & Real-time (Week 17)

- Alert rules engine: user configures trigger conditions and notification targets per company
- Real-time in-app notifications using Laravel Reverb + Echo (toast notifications + notification centre)
- Email notifications using Laravel Mail with bilingual templates
- SMS notification structure ready (gateway to be integrated post-MVP based on budget)
- Notification preferences per user (which notifications they want, which channel)
- Scheduled report delivery (queued jobs run reports and email to recipients)

Phase 12: Subscription Billing Integration (Week 17 continued)

- SSLCommerz integration for card payments
- bKash Business payment gateway for subscription upgrade
- Plan upgrade/downgrade flow in-app
- Subscription invoice generation
- Payment webhook handling and plan activation
- Grace period (7 days) on expiry before restrictions apply
- Admin panel for manually adjusting plans (for sales team use)

Phase 13: Polish, Testing & Performance (Weeks 18–19)

- Complete Bangla translation of every string in the application
- Bengali numerals toggle in reports, invoices, and payslips
- Pest test coverage: all API endpoints, all report generation jobs, all critical business logic
- Database indexing review and optimisation for all heavy queries
- Redis caching for dashboard widgets, reports, and frequently-accessed data
- Query optimisation: eager loading everywhere, no N+1 queries
- Error handling: user-friendly error messages everywhere, try-catch on all external calls
- Empty states and loading states in all Filament resources
- Mobile responsiveness check across all screens
- Security review: tenant isolation testing, rate limiting, HTTPS enforcement, input sanitisation
- Sentry or similar error monitoring configured

Phase 14: Pre-Launch (Week 20)

- Demo data setup: 3 scenarios — small retail shop, pharmacy with expiry tracking, 50-person company with HR and payroll
- Onboarding wizard: new user can set up their first company in under 5 minutes
- Public landing page: features, pricing table, video demo embed, signup CTA
- Record Bangla demo videos for YouTube and Facebook (one per business type)
- VPS deployment: XeonBD or Alpha Net, HTTPS, domain, monitoring configured
- Beta launch to 10–20 initial users for feedback collection

9. Timeline Summary

Phase	Focus	Weeks	Key Deliverable
0	Environment & Architecture	1	Running app with clean structure
1	Multi-Company + Subscriptions	2–3	Company creation, switching, role system, plan enforcement
2	Dynamic Fields + Workflow Engine	4–5	Custom fields + visual workflow builder working on any entity
3	Products & Inventory	6–7	Full inventory management with custom fields
4	Purchasing & Suppliers	8	Full purchase cycle PO to stock update
5	Sales & Invoicing	9–10	Full sales cycle with bilingual PDF invoices
6	Expenses	11	Expense management with configurable approval
7	Basic Accounting	12	P&L, balance sheet, receivables/payables
8	HR & Payroll	13–14	Complete monthly payroll cycle
9	POS	15	Fast-billing POS screen with receipt printing
10	Batch/Expiry + CRM	16	Pharmacy-ready batch tracking, basic CRM
11	Notifications + Billing	17	Real-time alerts + subscription payment integration
12	Testing + Performance	18–19	95%+ test coverage, optimised queries
13	Pre-Launch	20	Demo data, landing page, VPS deployment, beta users

Total: 20 weeks. Realistic for one developer with AI tools generating 70-80% of boilerplate code. The order is strict — Phases 0, 1, and 2 must be completed exactly as sequenced because every later phase depends on them.

10. Post-MVP Roadmap

Everything in this section is explicitly post-MVP. None of it is in scope for the 20-week build. Priority order will be determined by actual user feedback and revenue generated after launch.

9.1 Immediate Post-Launch (Months 1–3 after launch)

Based on beta user feedback, the most commonly requested missing features will be prioritised. Likely candidates:

- SMS notification gateway integration (bDBL, SSL Wireless, or similar)
- WhatsApp notification support
- Advanced POS features: table management for restaurants, kitchen display order
- Enhanced accounting: full double-entry with trial balance
- Biometric device direct integration (ZKTeco, etc.) via API
- Multi-currency support

9.2 Revenue-Dependent Features (Months 3–12)

- Manufacturing / Production module: BOM, job cards, production lines, material requirements planning
- E-commerce integrations: Shopify, WooCommerce, Daraz, Chaldal
- Advanced CRM: sales pipeline, deal tracking, rep performance, sales targets
- Asset Management: company assets, depreciation, maintenance schedule
- Project Management: project costing, resource allocation, milestones
- Custom Report Builder (full drag-and-drop, no-code)
- White-labeling for resellers and enterprise clients
- API marketplace for third-party integrations

9.3 AI Features (Post-Revenue — Investment Required)

AI features require significant infrastructure investment and will only be built once the product generates sufficient recurring revenue to fund them. No AI features are promised at MVP launch.

- AI-powered sales forecasting and demand prediction
- AI anomaly detection (unusual expenses, suspicious transactions)
- AI-generated business insights and recommendations on the dashboard
- Natural language report generation ("Show me last month's top 10 customers by revenue")
- AI-assisted payroll discrepancy detection

- Chatbot for in-app support and guidance

11. Hosting & Infrastructure

10.1 MVP Hosting

Component	Provider / Solution	Estimated Cost
Web Server (VPS)	XeonBD or Alpha Net (Bangladesh-based, low latency)	1,500–3,000 BDT/month
Database	MySQL on same VPS initially	Included in VPS
Cache / Queue	Redis on same VPS	Included in VPS
File Storage	Local server storage (MVP), migrate to S3-compatible later	Included
Email	Mailgun or AWS SES (transactional email)	~500–1,000 BDT/month
SSL Certificate	Let's Encrypt (free)	Free
Error Monitoring	Sentry (free tier)	Free tier
Domain	.com or .com.bd domain	1,000–2,000 BDT/year

10.2 Scale Path

As paying customers grow, the infrastructure scales in this order: separate database server (when concurrent queries slow down), managed Redis cluster (when queue volume increases), object storage for files (S3-compatible like Wasabi or DigitalOcean Spaces), CDN for static assets (CloudFlare — free tier covers most needs), dedicated servers for Enterprise clients with data sovereignty requirements.

10.3 Security Requirements

- HTTPS enforced on all routes — HTTP redirects to HTTPS
- Tenant isolation: every database query is company-scoped — cross-company data access is architecturally impossible
- Rate limiting on all API routes and login endpoints
- Input sanitisation and XSS protection (Laravel default + Filament)
- File upload validation: type checking, size limits, malware scanning on uploads
- Password hashing: bcrypt (Laravel default)
- Session security: CSRF protection, secure session cookies
- Audit trail on all sensitive operations
- Scheduled automated backups: database and file storage, daily, retained for 30 days

12. Launch Strategy

11.1 Beta Launch (End of Week 20)

Before public launch, recruit 10–20 beta users from different business types. Minimum: 2 retail shops, 1 pharmacy, 1 garments-related business, 1 service business, 1 solo entrepreneur. Offer free Pro plan for 3 months in exchange for honest feedback and willingness to be on a reference call. Fix all critical issues found in beta before public launch.

11.2 Public Launch

- Landing page live with features, pricing, video demos, and free signup
- Bangla demo videos published on YouTube (one per business type: retail, pharmacy, HR/payroll, solo entrepreneur)
- Facebook ads targeting business owners in Bangladesh (primary acquisition channel)
- YouTube channel with tutorial content in Bangla
- Influencer outreach: Bangladesh business YouTubers and Facebook pages
- Free tier as the primary acquisition tool — get businesses using the product, convert on growth

11.3 Conversion Strategy

Free to Pro conversion is triggered by natural growth limits: hitting the 3-company cap, needing more than 3 users per company, hitting the 500 SKU limit, or needing clean (non-watermarked) PDF invoices. The product is designed so that a growing business will naturally hit these limits within 3–6 months of active use, at which point upgrading is an easy decision.
