

GenERP BD

Complete Technical & Product Documentation

Generalised Cloud ERP / SaaS Platform for Bangladesh

Version 2.0 | MVP Planning Document | 2026

Stack	Timeline	Model	Language	Sections
Laravel 12 + FilamentPHP v4 + MySQL 8 + Redis	20 Weeks — Solo Developer + AI-Assisted	Freemium: 3 companies free / Unlimited on Pro	Bangla (primary) + English bilingual	22 sections — fully specified architecture

1. Project Overview

1.1 What is GenERP BD?

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

The core philosophy: one application, infinite configurations. No separate products per industry. No custom development per client. Every business type is served through a powerful dynamic configuration layer that shapes the application to their needs without writing a single line of code.

1.2 Target Business Types

Business Type	Primary Use of GenERP BD
Retail shops & supermarkets	POS, inventory, daily sales, supplier management
Pharmacies & drug stores	Batch/expiry tracking, POS, Mushak VAT compliance, patient records
Wholesale & trading companies	Bulk pricing, LC management, credit terms, supplier ledger
Manufacturing & RMG factories	Production tracking, buyer/style/LC fields, wage board payroll, costing
Restaurants & food businesses	Table-based POS, menu inventory, shift management, daily covers report
Service businesses (IT, agencies, clinics)	Client billing, project-based invoicing, service catalogue, retainer tracking
Solo entrepreneurs & freelancers	Income/expense, client invoicing, simplified dashboard
NGOs & non-profit organisations	Donor management, project costing, fund utilisation, grant tracking
Government offices & institutions	Multi-level purchase approvals, budget heads, expense compliance
Schools & educational institutions	Student fee management, grade/section tracking, teacher payroll
E-commerce businesses	Order management, inventory sync, courier tracking (post-MVP)

1.3 Key Differentiators

Differentiator	Description
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One login, many businesses	Single account manages unlimited companies and branches with per-company roles
Entity aliasing	"Customers" becomes "Patients", "Students", or "Donors" per business type — every entity can be renamed
Dynamic custom fields	Add any field to any entity — no developer needed
Configurable workflows	Each company defines their own approval chains and status flows per document type
Bangladesh compliance built-in	Mushak VAT forms, NBR invoice format, TDS/VDS, wage board payroll, BD tax slabs
Configurable tax engine	Multiple VAT rates, tax categories per product, TDS on payments — all configurable
Configurable number sequences	Custom invoice/PO/voucher number formats per company
Bangla-first UI	Full bilingual interface with Bangla as default, Bengali numerals in invoices
Service-mode for non-inventory businesses	Firms with no physical stock get a service catalogue instead of a warehouse module
Freemium acquisition model	3 companies free forever — businesses start without cost, upgrade as they grow

2. Business Model

2.1 Subscription Plans

Feature	Free	Pro (~3,500 BDT/mo)	Enterprise (~10,000+ BDT/mo)
Companies	Up to 3	Unlimited	Unlimited + custom domain
Users per company	3	Unlimited	Unlimited + advanced roles
Modules	Core only	All MVP modules	All + API access
Products / SKUs	500 max	Unlimited	Unlimited
Custom fields per entity	5	Unlimited	Unlimited
Workflow statuses per doc	3	Unlimited	Unlimited + automation
Dashboard widgets	5	Unlimited	Unlimited + custom
Reports	Basic only	Full + scheduled exports	Drill-down + custom builder
PDF invoices	Watermarked	Clean branded	Custom branding per company
Storage	1 GB	Unlimited	Unlimited + dedicated option
Audit log retention	30 days	Full history	Full history + export
Notifications	In-app only	In-app + email	In-app + email + SMS
Notification templates	Fixed system templates	Customisable per company	Fully customisable + multilingual
Number sequences	Fixed format	Fully configurable	Fully configurable
Entity aliasing	Fixed names	Fully configurable	Fully configurable
Bangladesh VAT / Mushak	Basic VAT only	Full Mushak forms 6.3/6.6	Full + NBR export
Data import	Products only	All entities	All entities + migration support
API access	None	Full REST API	Full + webhooks + higher rate limits
Support	Community/forum	Priority email	Dedicated account manager + phone

2.2 Billing & Payment

- SSLCommerz for card/online payments
- bKash Business gateway for mobile payment (highest BD conversion)
- Manual bank transfer with admin confirmation (for enterprise clients)
- Monthly and yearly billing cycles — yearly at 15% discount
- Payment integrated in Phase 12 of development after core product is validated

3. Technical Architecture

3.1 Tech Stack

Layer	Technology	Reason
Backend	Laravel 12 (monolithic)	AI-generation friendly, built-in queues/events/notifications/API, clean structure
Database	MySQL 8 (UTF8mb4_unicode_ci)	Full Bangla character support, JSON columns, mature, fast
Cache / Queues	Redis + Laravel Horizon	Dashboard/report caching, reliable async job processing
Admin UI	FilamentPHP v4	Beautiful responsive UI, datatables, forms, charts — ideal for solo developers
Charts	Filament Charts + ApexCharts	Native integration, rich visualisations
Real-time	Laravel Reverb + Echo	Official WebSockets, zero extra cost, native Laravel
Auth + RBAC	Laravel Sanctum + Spatie Permission	API tokens + per-company role/permission system
Multi-tenancy	stanc/tenancy (shared DB + company_id)	Scalable, simpler ops than multi-DB, Filament compatible
Testing	Pest + Laravel Dusk	Fast, expressive, excellent for AI-generated test suites
Bilingual	Laravel Localization (lang/bn + lang/en)	Full Bangla/English with per-company preference
Fonts	Noto Sans Bengali via Google CDN	Best Bangla web font, widely supported
File storage	Laravel Storage (local MVP → S3-compatible)	Simple start, scales to object storage
PDF generation	DomPDF / Laravel Snappy with Bangla font	Bangla text in invoices, payslips, Mushak forms
AI dev tools	Cursor.sh + Claude 4 + GitHub Copilot	Best combo for Laravel + Filament in 2026
Hosting (MVP)	XeonBD / Alpha Net VPS	BD-based, low latency, affordable start
Error monitoring	Sentry (free tier)	Real-time error tracking from day one

3.2 Multi-Tenancy Model

Shared database with company_id scoping via stanc/tenancy. Every business data table has a company_id column. A global Eloquent scope automatically filters all queries by the active company.

The user-to-company relationship is many-to-many via pivot — one user owns or is a member of multiple companies with different roles in each.

3.3 Core Database Tables

Table	Purpose
users	Central accounts — one account per person used across all companies
companies	Each registered business with settings, plan, branding, entity alias config
branches	Outlets / locations under a company (head office, branch, warehouse, factory floor)
company_user	Pivot: which users belong to which company with their role
plans	Plan definitions with all feature limits stored as JSON
subscriptions	Active subscription per company with status, expiry, grace period
subscription_invoices	Billing history — every payment generates an invoice record
usage_counters	Real-time metered usage per company per metric
roles / permissions	Spatie tables scoped per company
entity_aliases	Company-specific renaming of core entities (Customer → Patient etc.)
custom_field_definitions	User-defined fields per entity per company
custom_field_values	Stored values for custom fields (or JSON on entity)
custom_field_indexes	MySQL generated columns for indexed custom field filtering
number_sequences	Configurable numbering rules per document type per company
workflow_definitions	Status machine configs per document type per company
workflow_transitions	Allowed transitions, required roles, automation triggers
tax_groups	Named tax configurations per company (VAT 15%, VAT 5%, Zero-rated, etc.)
tax_rates	Individual rates within a tax group (for compound taxes)
notification_templates	Company-specific notification content templates per event
audit_logs	Full activity log: user, action, entity, old value, new value, timestamp
alert_rules	User-configured trigger conditions and notification targets

4. The Dynamic Configuration Layer

This is the architectural heart of GenERP BD. It is what makes the platform truly generalised — one codebase, any business, zero custom development.

4.1 Business Type Templates

When a user creates a company they select a business type. This applies a configuration preset that enables relevant modules, loads default custom fields, applies starter workflows, configures entity aliases, and sets up default alert rules. Everything the template sets can be changed afterwards.

Business Type	Entity Aliases Applied	Key Preset Fields	Default Modules Enabled
Retail Shop	Customer, Product, Supplier (no change)	Barcode, product SKU, selling unit	Inventory, POS, Sales, Purchases, Expenses, Reports
Pharmacy	Patient, Medicine, Drug Supplier	Batch no., expiry date, generic name, drug category, storage temp	Inventory, POS, Sales, Purchases, Batch/Expiry, Reports
Wholesale / Trading	Client, Item, Vendor	LC number, credit days, bulk pricing tier	Inventory, Sales, Purchases, Accounting, Reports
Manufacturing / RMG	Buyer, Style/Item, Raw Material Supplier	Style no., buyer, LC no., shipment date, season, production line	Inventory, Production, Sales, Purchases, HR, Payroll, Reports
Restaurant / Food	Guest, Menu Item, Food Supplier	Table no., cover count, shift, food category	POS, Inventory, Sales, Expenses, Reports
Service Business	Client, Service, Vendor	Project name, deliverable date, service category, retainer	CRM, Sales, Expenses, HR, Reports
Solo Entrepreneur	Client, Service, Vendor	Project name, payment terms	Income/Expense, Invoicing, Basic Reports
NGO / Non-Profit	Donor, Programme, Partner	Donor type, project code, grant ref, fund head	Donors, Projects, Expenses, HR, Payroll, Reports
Government / Institution	Department, Item, Contractor	Budget head, sanction no., requisition no., approval level	Purchases, Expenses, HR, Payroll, Reports
School / Education	Student, Course/Fee Head, Vendor	Grade, section, guardian, admission no., roll no.	Fees, HR, Payroll, Reports

4.2 Entity Aliasing System

A truly generalised ERP must speak the language of each business. A pharmacy does not have "Customers" — they have "Patients." A school does not have "Products" — they have "Fee Heads." Entity aliasing lets each company rename any core entity throughout the entire application: navigation, form labels, list headings, PDF documents, notification messages, and report titles.

Core Entity	Possible Aliases	Stored in
Customer	Patient, Student, Client, Donor, Subscriber, Resident, Guest, Buyer	entity_aliases table, keyed by company_id + entity_key
Product	Medicine, Menu Item, Course, Fee Head, Style, Material, Asset, Service	entity_aliases table
Supplier	Drug Supplier, Food Supplier, Contractor, Vendor, Raw Material Supplier	entity_aliases table
Invoice	Receipt, Bill, Fee Challan, Tax Invoice, Sales Order, Proforma	entity_aliases table
Purchase Order	Requisition, Work Order, Material Request, Procurement Order	entity_aliases table
Expense	Expenditure, Cost, Disbursement, Overhead	entity_aliases table
Employee	Staff, Teacher, Worker, Officer, Associate, Crew Member	entity_aliases table
Branch	Outlet, Campus, Factory Floor, Department, Ward, Zone	entity_aliases table
Warehouse	Store, Dispensary, Cold Room, Godown, Rack	entity_aliases table

Implementation: A global `__entity()` helper function replaces `__()` for entity names. It first checks `entity_aliases` for the active company, falls back to the business type default, then falls back to the system default. Every Filament resource, every form label, every notification template, and every PDF template uses `__entity()` for entity references — never hardcoded strings.

4.3 Dynamic Custom Fields Engine

Every major entity supports user-defined custom fields per company. A pharmacy adds Batch Number, Expiry Date, Generic Name to their products. An RMG factory adds Buyer, Style Number, LC Number to sales orders. The same entity, completely different fields per company.

Field Type	Use Case Example	Storage
Text (short)	Generic drug name, Style number, LC reference	VARCHAR column in <code>custom_field_values</code>

Text (long / textarea)	Product description, Supplier notes, Compliance remarks	TEXT column
Number	Carton quantity, Commission %, Weight (KG), Minimum order qty	DECIMAL column
Date	Expiry date, Shipment date, Warranty expiry, LC opening date	DATE column
Dropdown (single)	Drug category, Fabric type, Buyer country, Payment method	VARCHAR column + options JSON in definition
Multi-select	Certifications, Applicable sizes, Target markets, Washing instructions	JSON column
Boolean (Yes/No)	Controlled substance, VAT applicable, Bonded warehouse, Active ingredient	TINYINT column
File / Document upload	Drug license, LC document, NID scan, Product catalogue	File path stored, file in storage
URL	Supplier catalogue, Product spec sheet, Compliance certificate	VARCHAR column
Formula (calculated)	Commission = amount * rate, Markup = (sell_price - cost) / cost * 100	Computed on render, not stored

Performance strategy for custom field filtering:

At large scale (100,000+ records), filtering on JSON or EAV values is slow. GenERP BD uses MySQL generated columns to create real indexed columns for any custom field marked as "filterable" by the company admin. When a field is marked filterable, a background job creates the generated column and index automatically. This gives native-speed filtering on custom fields without schema changes per company.

4.4 Dynamic Workflow Engine

Each company configures their own state machine per document type. No two companies need the same workflow. A small shop processes a Purchase Order in 3 steps. A government office may require 7 approval levels for the same document.

Configurable Element	Description
Statuses	Any number of named statuses per document type (e.g. Draft, Pending, Approved, Rejected, Closed)
Transitions	Which status changes are allowed and in which direction
Role permissions	Which company roles can trigger each transition

Approval type	Single approver, parallel (all must approve), or sequential (one after another)
Automation on transition	Send notification, update stock, generate journal entry, trigger alert rule, send email
Rejection handling	Where a rejected document goes, whether it can be resubmitted, who is notified
SLA timers	Optional: escalate to next level if approval not taken within X hours (Post-MVP)

Document types with configurable workflows: Purchase Orders, Sales Orders / Invoices, Expense Claims, Leave Requests, Production Jobs, Payroll Runs, Credit Notes / Returns, Salary Advances.

4.5 Dynamic Dashboard

Widget-based grid — each company configures which widgets appear, their position, and their parameters. Widgets update in real-time via Laravel Reverb. The same widget can appear multiple times with different filters (e.g. Sales for Branch A and Sales for Branch B side by side).

Core widgets: Total Sales (today/week/month), Total Purchases, Cash Balance, Low Stock Count, Upcoming Expiries, Pending Approvals, Attendance Summary, Outstanding Receivables, Outstanding Payables, Best Selling Products, Pending Salary Run, New Customers This Month, Expense Summary, VAT Due This Month.

4.6 Dynamic Report Builder

- Choose entity: Products, Sales, Purchases, Employees, Expenses, Customers, Suppliers
- Select fields including custom fields
- Group and aggregate: sum, count, average, max, min
- Apply filters on any field including date ranges
- Visualise as table, bar chart, line chart, pie chart
- Save as named template for reuse
- Schedule to run daily/weekly/monthly and email to specified recipients
- Export to PDF and Excel — Pro+ only

4.7 Dynamic Alert Rules Engine

Every company configures their own alert conditions. No hardcoded thresholds. Any field on any entity can be a trigger condition.

Component	Options
Trigger entity	Product, Invoice, Purchase Order, Employee, Expense, Leave Request, Subscription

Trigger condition	Field value less than / greater than / equals / is empty / date within X days / date past
Frequency	Check on every save, or on schedule (hourly, daily)
Notify target	Specific users, specific roles, company owner, branch manager
Channel	In-app notification, Email, SMS (post-MVP)
Repeat behaviour	Notify once, or repeat every X hours until condition resolves
Snooze	User can snooze an alert for X hours from the notification centre

4.8 Simplified Mode for Micro-Businesses

A solo entrepreneur or micro-business logging into GenERP BD should not face the same complexity as an RMG factory. Simplified Mode is a per-company setting that activates a stripped-down UI experience:

- Navigation reduced to: Dashboard, Income, Expenses, Clients, Invoices, Reports
- Dashboard shows only: money in this month, money out this month, outstanding invoices, recent activity
- No warehouse, no batch tracking, no HR, no payroll, no POS visible
- Forms are shorter — only the most essential fields shown by default
- One-click invoice to client with simple line items
- The user can exit Simplified Mode at any time from settings to access full functionality

Simplified Mode is not a different product. It is a UI configuration layer over the same codebase. Data created in simplified mode is fully compatible with all other modules if the company grows and switches to full mode.

5. Bangladesh Regulatory Compliance

This section covers the BD-specific legal and regulatory requirements that GenERP BD must handle correctly. Getting these wrong exposes the user to legal risk. This is a critical differentiator from international ERP products that do not support BD compliance.

5.1 VAT & Mushak Framework

Bangladesh VAT is administered by the National Board of Revenue (NBR) under the VAT and Supplementary Duty Act 2012. GenERP BD must support the full Mushak (VAT) document workflow for registered VAT-paying companies.

Mushak Form	Name	When Generated	Who Uses It
Mushak 6.3	VAT Challan (Tax Invoice)	On every VAT sale to a VAT-registered buyer	All VAT-registered businesses
Mushak 6.6	Credit Note / Debit Note	On sales return or price adjustment after invoice	All VAT-registered businesses
Mushak 9.1	Treasury Challan	When depositing VAT collected to government treasury	All VAT-registered businesses
Mushak 6.1	Purchase Input Register	Monthly record of all VATable purchases	Manufacturing and trading companies
Mushak 6.2	Sales Output Register	Monthly record of all VATable sales	All VAT-registered businesses
Mushak 4.3	VAT Registration Certificate Display	Static — stored and displayable in company settings	VAT-registered businesses

VAT Rate Configuration:

Bangladesh has multiple VAT rates. The system must support all of them, configurable per product/service category:

Rate	Applies To
15%	Standard rate — most goods and services
10%	Selected services (e.g. audit firms, consultancy)
7.5%	Selected goods and services (e.g. contractors)
5%	Selected goods (e.g. handloom, small cottage industry)
2%	Truncated rate for certain traders

0% (Zero-rated)	Exports — VAT charged at 0%, input VAT refundable
Exempt	Essential goods (rice, basic vegetables, medicines in some categories)

VAT implementation in GenERP BD:

- Each company has a VAT registration toggle in settings — if off, no VAT fields appear anywhere
- VAT BIN (Business Identification Number) stored in company settings — printed on all Mushak forms
- Tax groups configured per company (see Section 7): each group maps to one of the BD VAT rates above
- Products assigned to a tax group — VAT calculated automatically on invoicing
- Mushak 6.3 generated automatically on every VAT invoice — PDF formatted per NBR requirements
- Mushak 6.2 (monthly sales register) generated as a scheduled report — exportable to Excel and PDF
- Mushak 6.1 (monthly purchase register) generated from purchase data
- VAT amount broken out separately on every invoice, purchase order, and financial report
- Monthly VAT liability report: total output VAT collected minus input VAT paid = VAT payable to NBR

5.2 TDS & VDS (Withholding Tax)

Tax Deducted at Source (TDS) and VAT Deducted at Source (VDS) are mandatory deductions on certain supplier payments in Bangladesh. GenERP BD must support these for compliant supplier payments.

Type	Description	BD Legal Basis
TDS (AIT)	Advance Income Tax deducted at source on supplier payments. Rate varies by supplier type (1%-10%). Deducted before payment is made.	Income Tax Ordinance 1984, Section 52
VDS	VAT deducted at source when paying VAT-registered suppliers for certain services. Paying company remits the VAT directly to NBR instead of paying full amount to supplier.	VAT Act 2012, Section 49

- TDS rate configurable per supplier (based on their business category)
- On supplier payment entry: TDS and VDS amounts auto-calculated and shown separately
- Net payment = Invoice amount - TDS - VDS
- TDS/VDS amounts tracked separately for remittance to NBR
- Monthly TDS/VDS remittance report generated for NBR deposit
- TDS certificate (Challan) generated for supplier upon request

5.3 NBR-Compliant Invoice Format

All invoices generated by GenERP BD for VAT-registered companies must follow the NBR-mandated Mushak 6.3 format. Required fields on every tax invoice:

- Seller's name, address, and VAT BIN
- Buyer's name, address, and VAT BIN (if VAT-registered buyer)
- Invoice number and date
- Description of goods/services, quantity, unit, unit price
- Taxable value (before VAT)
- VAT rate and VAT amount per line item
- Supplementary duty (if applicable)
- Total taxable value, total VAT, total supplementary duty, grand total
- Challan number (for treasury payment reference, where applicable)

5.4 Income Tax (Employee Payroll)

Bangladesh personal income tax slabs are applied to employee salaries during payroll calculation. GenERP BD maintains the current NBR tax slabs and applies them automatically. The slabs are stored as configurable data (not hardcoded) so they can be updated annually when NBR revises them without a code deployment.

Current BD income tax slabs (as of 2025-26 fiscal year — update annually in system settings):

Annual Income (BDT)	Tax Rate
Up to 3,50,000	Nil (exempt)
Next 1,00,000	5%
Next 3,00,000	10%
Next 4,00,000	15%
Next 5,00,000	20%
Above 16,50,000	25%

- Tax calculated annually then divided by 12 for monthly payroll deduction
- Tax-exempt allowances (house rent, medical up to limits) handled correctly
- Tax year configurable (BD tax year: July–June)
- Tax slab table updatable by superadmin without code deployment

5.5 Wage Board Compliance (RMG / Garments)

Bangladesh garments and manufacturing factories are governed by the Minimum Wage Board. GenERP BD supports wage board salary structures for RMG factories:

- Configurable grade/level system (Grade 1–7 per the BD Garments Wage Board)
- Minimum wage enforcement per grade — system warns if salary set below minimum

- Attendance-based salary calculation ($\text{monthly wage} \div \text{working days} \times \text{days present}$)
- Overtime calculation ($\text{daily rate} \times 2$ for overtime hours)
- Festival bonus: 2 bonuses per year (Eid-ul-Fitr and Eid-ul-Adha) at one month's basic salary each — calculated automatically
- Provident Fund: 5% of basic salary — both employer and employee contribution tracked
- Gratuity tracking (post-MVP — calculated on service years)

6. Subscription Enforcement Architecture

Every module and every request in GenERP BD passes through this layer. It defines who can do what, at what scale, and what happens when limits are reached.

6.1 Subscription Data Model

Table	Key Columns	Purpose
plans	id, name, slug, price_bdt, billing_cycle, features (JSON), limits (JSON), is_active	Plan definitions — limits and features stored as JSON so changes require only a DB update, not a code deployment
subscriptions	id, company_id, plan_id, status (active/grace/expired/cancelled/suspended), started_at, expires_at, grace_until, cancelled_at, payment_method, last_payment_at, next_billing_at	One active subscription per company — 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 payment generates a record for audit and receipt
usage_counters	id, company_id, metric (companies/users/products/custom_fields/storage_bytes), current_value, last_reset_at	Real-time metered usage — incremented/decremented as resources are created or deleted

6.2 Plan Limits JSON Structure

Example of plans.limits JSON for Free tier:

```
{ "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,
  "modules": ["inventory", "sales", "purchases", "expenses", "hr", "pos", "reports"], "features": {
    "report_export": false, "scheduled_reports": false, "api_access": false, "entity_aliasing":
    false, "custom_number_sequences": false, "mushak_forms": false, "notification_templates":
    false, "white_label": false } }
```

Pro and Enterprise plans have higher numbers, more modules, and true for all feature flags. Changing any limit requires only a database update — no code deployment. New limits or features are added by adding a key to each plan's JSON.

6.3 Middleware Stack (Every Request)

Order	Middleware	What it does
1	AuthenticateMiddleware	Verifies the user is logged in and session is valid
2	SetActiveTenantMiddleware	Reads active company from session, sets global company_id scope on all Eloquent models, loads subscription from Redis cache into request context
3	CheckSubscriptionStatusMiddleware	Reads subscription.status. If expired (past grace_until): redirect to /subscription/expired. If grace period active: inject warning banner but allow full access. If suspended: redirect to support page.
4	EnforceModuleAccessMiddleware	Every Filament resource and route is tagged with a module slug. Checks if slug exists in plan modules array. If not: return 403 with upgrade prompt.
5	CheckFeatureFlagMiddleware	For feature-level actions (export, API, custom sequences, Mushak forms): checks the relevant boolean in plan features JSON. Blocks with upgrade prompt if false.

The middleware reads from the subscription context cached in Redis — zero extra database queries per request for subscription checking.

6.4 Usage Tracking & Quota Enforcement

Limit	Checked When	Behaviour
Company count (3 Free)	On Create Company submit	Block if usage >= limit. Show upgrade modal. Counter increments on create, decrements on delete.
Users per company	On Invite User	Block if active user count >= limit. Counter reflects only active (non-revoked) users.
Products (500 Free)	On Save Product	Block if product count >= limit. Counter reflects active (non-archived) products only.
Custom fields (5 Free)	On Add Custom Field	Block if count for that entity >= limit.
Storage (1 GB Free)	On every file upload	Pre-check before upload. Calculate current usage from Redis (recalculated hourly). Block if new file would exceed limit.
Workflow statuses (3 Free)	On workflow save	Block save if status count > limit. Highlight limit in builder UI.
Audit log retention	Nightly scheduled job	Delete audit_logs older than plan limit for Free companies. Pro/Enterprise: no deletion.

6.5 Limit Boundary Behaviour

Stage	Threshold	User Experience
Warning	80% of any quota used	Subtle yellow banner on the relevant list page: "You have used 400 of 500 products. Upgrade to Pro for unlimited products."
Soft block	100% of quota reached	Create/Add button greyed with lock icon. Clicking opens upgrade modal — not an error, an invitation. All existing records remain fully accessible.
Grace period	Subscription expired	Full access for 7 days. Red banner on every page. Daily escalating reminder emails. Full feature access continues.
Hard block	Grace period ended	Read-only mode. All data visible, no new records, no exports, no reports. Full-screen upgrade prompt on login. Data never deleted.

6.6 Upgrade & Downgrade Flows

Upgrade (immediate):

1. User clicks any upgrade prompt or Settings > Subscription > Upgrade
2. Pricing page with monthly/yearly toggle
3. Payment via bKash, SSLCommerz, or bank transfer
4. On payment webhook: plan updated, status set to active, Redis cache invalidated, features unlocked immediately
5. User redirected back to what they were doing — with new features unlocked

Downgrade (end of billing cycle):

6. User selects lower plan in Settings > Subscription
7. System checks if current usage exceeds lower plan limits — shows conflict list (e.g. "You have 8 users. Pro allows 3. Remove 5 before downgrade takes effect.")
8. User must resolve all conflicts
9. Downgrade scheduled for end of billing period — not immediate
10. On billing period end: plan switches, limits enforced, confirmation email sent

6.7 Free Tier Permanent Restrictions

Enforced at middleware/route level — not just UI. Cannot be bypassed:

- PDF invoices always watermarked with "Generated by GenERP BD"
- Report export (PDF/Excel) buttons hidden — route returns 403 if accessed directly
- Scheduled report delivery blocked
- API routes return 403 for all calls from Free companies
- CRM module route returns 403
- Entity aliasing configuration page blocked
- Custom number sequences page blocked
- Mushak form generation blocked (basic VAT only)
- Notification template customisation blocked

- Audit log auto-pruned to 30 days by nightly job
- Dashboard widget add button hidden after 5 widgets

6.8 Superadmin Panel

- View all companies, plan, expiry, usage counters
- Manually assign/change plan (for sales deals, partnerships, special pricing)
- Extend grace period or expiry (for clients with payment processing delays)
- Generate subscription invoices for bank transfer clients
- Suspend/unsuspend a company (abuse, chargeback scenarios)
- View revenue dashboard: MRR, churn, upgrade/downgrade counts, new signups

7. Tax Configuration Engine

The tax engine handles all forms of taxation in GenERP BD — VAT, supplementary duty, TDS, VDS — in a fully configurable way. Tax rates and categories are defined per company and are never hardcoded in application logic.

7.1 Tax Groups

A Tax Group is a named tax configuration that can be assigned to products, services, or supplier payment types. Each company creates the tax groups that apply to their business.

Example Tax Group	Rate	Applies To	Auto-generate Mushak
Standard VAT	15%	Most goods and services sold locally	Yes — Mushak 6.3
Reduced VAT (Contractor)	7.5%	Construction and contractor services	Yes
Export Zero-Rate	0%	Any export sale	Yes — zero-rated challan
VAT Exempt	Exempt	Essential goods, medicines (specific list)	No
Supplementary Duty	SD 45% + VAT 15%	Tobacco, luxury goods	Yes — compound calculation
TDS — Contractor	5% TDS	Payments to contractors under Section 52	No — deducted on payment, not sale
VDS — Service	15% VDS	VAT deducted at source on service payments	No — remitted directly to NBR

7.2 Tax Engine Rules

- Each product or service is assigned exactly one tax group
- On invoicing: tax calculated per line item based on the product's tax group
- On supplier payment: if supplier has TDS/VDS type configured, deductions auto-calculated
- Compound taxes (SD + VAT): SD calculated first, then VAT applied on (value + SD)
- Zero-rated sales tracked separately for input VAT refund calculation
- Tax groups updatable by company admin — changing a group affects all future transactions, not historical ones
- Monthly tax summary: output tax collected, input tax paid, net tax payable, broken down by tax group

7.3 VAT-Exempt Companies

If a company is not VAT-registered, the entire VAT layer is hidden from their UI. No tax groups, no Mushak forms, no VAT fields on invoices. They see clean simple invoices with just the total amount. This is controlled by a single toggle in company settings: "VAT Registered: Yes/No."

8. Number Sequencing Engine

Every document in GenERP BD has a unique number: Invoice, Purchase Order, Credit Note, Expense Voucher, Journal Voucher, Payroll Run, etc. Different companies use completely different numbering formats. The Number Sequencing Engine lets each company define their own format per document type.

8.1 Sequence Configuration

Configuration Field	Description	Example
Document type	Which document this sequence applies to	Sales Invoice, Purchase Order, Credit Note, Expense, Journal
Prefix	Fixed text at the start of the number	INV-, PO-, CN-, EXP-2026-
Suffix	Fixed text at the end of the number	-DHA (for Dhaka branch)
Separator	Character between parts	-
Number length	Minimum digits with zero-padding (e.g. 5 = 00001)	5 digits → 00001
Start value	What number to start from (for businesses migrating in mid-year)	1, 1001, 5000
Reset period	When the counter resets: never, yearly (Jan 1 or BD fiscal year Jul 1), monthly	Yearly reset → INV-2026-00001 becomes INV-2027-00001
Include year	Whether to embed the current year in the number	Yes → INV-2026-00001
Include month	Whether to embed the current month	Yes → INV-2026-01-00001
Include branch code	Whether to embed the branch identifier	Yes → INV-DHA-2026-00001
Preview	Live preview of the format as configuration is typed	INV-DHA-2026-00001

8.2 How It Works

- number_sequences table stores the configuration and the current counter value per company per document type per branch (if branch-specific)
- On document creation: sequence engine reads the config, formats the number, atomically increments the counter using MySQL transactions to prevent duplicate numbers even under concurrent creation
- Numbers are never reused — even if a document is deleted, its number is retired
- Branch-specific sequences: if enabled, Branch A and Branch B maintain separate counters for the same document type
- Manual override: admin can manually set the current counter value (for migration scenarios)
- Sequence configuration is locked after the first document is created — to prevent number format changes mid-year which would break reporting and legal records

Number sequences for VAT invoices (Mushak 6.3) must be sequential with no gaps under NBR regulations. The engine enforces this — deleted invoices cannot be renumbered.

9. Inter-Branch Operations

Multi-branch is a core feature of GenERP BD. Businesses with multiple outlets, warehouses, or office locations need branch-aware operations, reporting, and access control.

9.1 Branch Structure

Concept	Description
Company	The top-level entity. One legal business. One VAT BIN. One set of accounts.
Branch	A physical or logical sub-unit of the company. Has its own address, may have its own bank account, its own POS terminals, its own stock.
Warehouse	A stock location within a branch (or standalone). One branch can have multiple warehouses (main floor, cold room, overflow).
Branch users	A user can be restricted to one branch (cashier, branch manager) or can see all branches (company owner, accountant).

9.2 Stock Transfers Between Branches

- Stock Transfer document: creates a transfer request from source branch/warehouse to destination
- Transfer goes through a configurable workflow: Created → In Transit → Received (or Rejected)
- Stock deducted from source on "In Transit" status (or on "Received" — configurable per company)
- Stock added to destination on "Received" confirmation by destination branch manager
- Partial receipts supported: receive 80 of 100 units, remaining 20 remain In Transit
- Full audit trail of all stock movements between branches
- Stock transfer report: what moved between which branches, when, by whom

9.3 Consolidated vs Branch-Level Reporting

Report Type	What it shows
Company consolidated	Totals across all branches — sales, purchases, inventory valuation, P&L
Branch-level	Same reports filtered to a single branch — branch manager's view
Branch comparison	Side-by-side: Branch A vs Branch B vs Branch C on key metrics
Inter-branch transfers	All stock movements between branches in a period
Branch P&L	Revenue and costs attributable to each branch (requires branch-level expense tagging)

9.4 Branch-Level Access Control

- Branch Manager role: can see and operate only their assigned branch(es)
- Company Owner / Admin: sees all branches, can switch branch context in the UI
- POS Cashier: restricted to their assigned POS terminal and branch
- Accountant: can see all branches for financial consolidation but cannot create operational records
- Branch-level data filtering applies automatically based on the user's assigned branches — no manual filtering required

9.5 POS with Multi-Branch Stock

A POS sale at Branch A deducts stock from Branch A's warehouse. If Branch A has insufficient stock, the POS screen can optionally show availability at other branches and trigger a transfer request — the sale is held until the transfer is confirmed. This behaviour is configurable per company.

10. Data Migration & Import Strategy

Businesses migrating from another system (paper records, Excel, Tally, another ERP) need to bring their existing data into GenERP BD. A weak migration path is a major adoption barrier. GenERP BD provides structured import for all major entities.

10.1 Importable Entities

Entity	Import Method	Key Considerations
Products / Services	Excel template with all core fields + custom fields	Validate duplicate SKUs, unknown categories — show error report before import
Opening stock	Excel template: product, warehouse, quantity, cost price	Must be done after products are imported. Sets initial stock balance.
Customers	Excel template: name, contact, address, credit terms, opening balance	Opening balance creates an opening journal entry in accounts receivable
Suppliers	Excel template: name, contact, address, payment terms, opening balance, TDS rate	Opening balance creates an opening journal entry in accounts payable
Employees	Excel template: personal info, department, designation, salary structure, join date	Salary components must match company's configured salary structure
Opening account balances	Excel template: account, debit/credit amount, date	For businesses with existing accounting — sets the starting trial balance
Historical sales	Excel template (optional)	For reporting continuity — imported as closed/paid invoices, not editable
Historical purchases	Excel template (optional)	Same as historical sales — for reporting continuity only
Attendance (historical)	CSV from biometric machine	Standard biometric CSV format — date, employee ID, time in, time out

10.2 Import Process

11. User downloads the Excel template for the entity they want to import
12. Template includes column headers with instructions and a sample row

13. User fills in their data and uploads the file
14. System validates all rows: checks required fields, validates data types, checks for duplicates, checks that referenced entities (category, warehouse, department) exist
15. Validation report shown: green rows (ready to import), red rows (errors with specific explanation per row)
16. User can download the error report, fix it, and re-upload
17. User confirms import of valid rows — invalid rows are skipped and can be fixed later
18. Import runs as a queued background job — no timeout issues for large files
19. Import completion notification sent in-app and via email with summary (X imported, Y skipped)

10.3 Migration Support (Enterprise Plan)

Enterprise clients get migration assistance from GenERP BD support staff: a review of their existing data, custom import templates if their data format is non-standard, and a validation call before going live. This is a service differentiator for the Enterprise tier.

11. API Architecture

API access is available on Pro and Enterprise plans. It allows companies to integrate GenERP BD with their own systems, e-commerce platforms, biometric devices, or custom-built tools.

11.1 API Design Principles

- RESTful JSON API — standard HTTP methods (GET, POST, PUT, DELETE)
- Versioned: all routes prefixed with /api/v1/ — breaking changes go to /api/v2/
- Authenticated via Laravel Sanctum API tokens — per-company, per-user tokens
- Multi-tenancy in API context: the API token identifies both the user and the company. One token per company per user.
- Rate limited: Pro plan — 1,000 requests/hour. Enterprise — 10,000 requests/hour. Free — 0 (blocked).
- All API responses follow a consistent envelope: { success, data, message, errors, meta }
- Pagination on all list endpoints: cursor-based pagination for performance on large datasets

11.2 Core API Endpoints (MVP)

Resource	Endpoints	Notes
Products	/products (GET, POST), /products/{id} (GET, PUT, DELETE), /products/{id}/stock (GET)	Includes custom fields in response
Customers	/customers (GET, POST), /customers/{id} (GET, PUT), /customers/{id}/ledger (GET)	Entity alias respected in response labels
Suppliers	/suppliers (GET, POST), /suppliers/{id} (GET, PUT)	Includes TDS rate
Sales Invoices	/invoices (GET, POST), /invoices/{id} (GET), /invoices/{id}/pdf (GET)	POST creates invoice and triggers workflow
Purchase Orders	/purchases (GET, POST), /purchases/{id} (GET, PUT)	Supports status transition via PUT
Expenses	/expenses (GET, POST), /expenses/{id} (GET)	
Stock	/stock/movements (GET), /stock/transfer (POST)	Real-time stock levels per warehouse
Employees	/employees (GET, POST), /employees/{id} (GET, PUT)	Salary data excluded unless HR scope
Reports	/reports/{slug} (GET)	Returns report data as JSON — same data as UI reports

Webhooks (Enterprise)	/webhooks (GET, POST, DELETE)	Subscribe to events: invoice.created, payment.received, stock.low, etc.
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11.3 API Token Management

- Tokens created in Settings > API > Manage Tokens
- Each token has a name (e.g. "Shopify Integration", "Biometric Device"), creation date, last used date
- Scopes per token: read-only, read-write, specific modules only (e.g. only stock and products)
- Tokens can be revoked at any time — revocation is immediate
- Token activity log: every API call logged with endpoint, method, status code, timestamp

11.4 Webhook System (Enterprise)

- Companies subscribe to specific events via the API or Settings > Webhooks
- On event: GenERP BD sends a POST request to the configured endpoint with event data as JSON
- Events available: invoice.created, invoice.paid, purchase.approved, stock.low, employee.payslip_generated, payment.received
- Webhook delivery with retry logic: 3 retries on failure with exponential backoff
- Webhook log: every delivery attempt with response code and response body

12. Notification Template System

Notifications in GenERP BD are not hardcoded strings. Every notification type has a template that can be customised per company on Pro and Enterprise plans. Templates are bilingual and support dynamic variables.

12.1 Notification Types & Channels

Channel	Description	When used
In-app (toast)	Real-time popup notification in the UI via Laravel Reverb	Immediate alerts: low stock, new approval request, payment received
In-app (notification centre)	Persistent inbox inside the app — user can review and dismiss	All alerts — persisted until dismissed or auto-cleared after 30 days
Email	Transactional email via Mailgun/SES	Invoices to customers, approval requests, payslips, scheduled reports, subscription alerts
SMS (post-MVP)	SMS gateway (SSL Wireless / bDBL)	Critical alerts: overdue invoice, low stock, salary processed

12.2 Template Variables

Every notification template supports dynamic variables that are replaced with actual data at send time. Available variables depend on the notification type:

- `{{ company_name }}` — the company's display name
- `{{ user_name }}` — the recipient's name
- `{{ entity_name }}` — the aliased entity name (e.g. "Patient" instead of "Customer")
- `{{ document_number }}` — e.g. INV-2026-00123
- `{{ amount }}` — formatted amount in BDT with Bengali or Arabic numerals per company setting
- `{{ due_date }}` — formatted date in Bangla or English per company preference
- `{{ quantity }}` — stock quantity
- `{{ product_name }}` — the aliased product entity name
- `{{ action_url }}` — deep link to the relevant record in the app
- `{{ sender_name }}` — the user who triggered the notification

12.3 Customisable Notification Events

Event	Default Subject / Title	Customisable on Plan
Invoice sent to customer	Invoice <code>{{ document_number }}</code> from <code>{{ company_name }}</code>	Pro+

Payment received	Payment of {{ amount }} received — {{ document_number }}	Pro+
Invoice overdue	Invoice {{ document_number }} is overdue — {{ amount }} outstanding	Pro+
Low stock alert	Low stock: {{ product_name }} — {{ quantity }} remaining	Pro+
Expiry alert	{{ product_name }} batch expiring in {{ days }} days	Pro+
Purchase order approved	PO {{ document_number }} approved — pending goods receipt	Pro+
Expense rejected	Your expense {{ document_number }} was rejected	Pro+
Payslip ready	Your payslip for {{ month }} is ready	Pro+
Leave request approved	Your leave request for {{ dates }} has been approved	Pro+
Subscription expiry warning	Your GenERP BD {{ plan }} plan expires in {{ days }} days	System — not customisable

12.4 Template Management

- Settings > Notifications > Templates (Pro+ only)
- Each template has a Bangla version and an English version — the system sends in the recipient's preferred language
- WYSIWYG editor for email templates (drag-and-drop blocks: header, body, button, footer)
- Plain text editor for in-app and SMS templates
- Preview with sample data before saving
- Reset to system default option if customisation is causing issues
- Free plan companies use the system default templates — no customisation access

13. Audit Log Design

The audit log records every significant action in the system. It is a critical feature for compliance-heavy businesses (government, NGO, enterprise) and a key tool for resolving disputes and investigating data changes.

13.1 What is Logged

Category	Actions Logged
Authentication	Login (success + failed), logout, password change, 2FA events, API token created/revoked
Company / settings	Company settings changed, plan upgrade/downgrade, module enabled/disabled, user role changed, user invited/removed
Financial documents	Invoice created/edited/deleted, payment recorded, purchase order created/approved/received, expense created/approved/rejected, journal entry posted, credit note issued
Inventory	Stock received, stock issued, stock adjusted, stock transferred, product created/edited/deleted/archived
HR / Payroll	Employee created/edited, payroll run created/approved/processed, leave request created/approved/rejected, attendance edited
Configuration	Custom field added/edited/deleted, workflow edited, number sequence changed, alert rule created/deleted, notification template edited
Data operations	Import run (entity, count, errors), export run (report, filters, format), bulk action (delete/archive X records)
API access	Every API call: token used, endpoint, method, response status, timestamp

13.2 Audit Log Data Structure

Column	Type	Description
id	BIGINT	Primary key
company_id	BIGINT	Tenant scope
user_id	BIGINT	Who performed the action (null for system/scheduled actions)
action	VARCHAR	Verb: created, updated, deleted, approved, rejected, login, export, etc.
entity_type	VARCHAR	What was acted on: Invoice, Product, Employee, PurchaseOrder, etc.
entity_id	BIGINT	ID of the affected record (null for login events)
entity_label	VARCHAR	Human-readable identifier: Invoice INV-2026-00123, Employee John Doe

old_values	JSON	Snapshot of changed fields before the action (null for creates)
new_values	JSON	Snapshot of changed fields after the action (null for deletes)
ip_address	VARCHAR	IP address of the request
user_agent	VARCHAR	Browser / API client identifier
created_at	TIMESTAMP	When the action occurred

13.3 Audit Log UI & Access

- Accessible from Settings > Audit Log — visible to owner and admin roles only
- Filter by: date range, user, action type, entity type, entity ID
- Search by entity label (e.g. search for a specific invoice number)
- Click any log entry to see a diff view: old values vs new values side by side
- Export audit log to Excel (Pro+) or as PDF (Enterprise)
- Free plan: audit log visible but pruned to last 30 days by nightly job
- Pro plan: full history retained indefinitely
- Enterprise plan: full history + export + the ability to forward audit logs to external SIEM

13.4 Performance Considerations

The audit log can grow very large for active companies. Performance strategy:

- audit_logs table is partitioned by month (MySQL table partitioning) — queries on recent data are fast regardless of total size
- created_at, company_id, entity_type, and user_id are indexed for the most common filter combinations
- Audit log writes are async — the action completes immediately, audit log is written in a queued job so it never slows down the user-facing operation
- Old partitions (3+ months) are moved to a cold storage partition with slower but available access

14. MVP Module List

#	Module	All Tiers	Pro+ Only	Supports Service Mode
1	Foundation & Multi-Company	Full	Custom domain, white-label	Yes
2	Products & Inventory	Core	Unlimited SKUs, bulk import all fields	Yes — becomes Service Catalogue
3	Purchasing & Suppliers	Core	Advanced import, multi-currency (post-MVP)	Yes — purchase of services
4	Sales & Invoicing	Core	Clean PDFs, Mushak forms, scheduled reminders	Yes — service invoicing
5	Expenses	Core	Full custom fields, budget heads	Yes
6	Basic Accounting & Ledger	Core	Full history, export	Yes
7	HR & Payroll	Core	Advanced salary structures, wage board tools	Yes
8	POS	Core	Full session management	No — inventory dependent
9	Batch & Expiry	Core	Full traceability report	No — inventory dependent
10	CRM	—	Full feature (Pro+ only)	Yes
11	Reports & Dashboard	Basic	Full builder, exports, scheduled delivery	Yes

Service Mode: when a company has no physical inventory (agencies, clinics, consultancies), the Inventory module switches to Service Catalogue mode. No stock movements, no warehouses, no barcode. Just a list of services with prices that can be added to invoices.

Module Details — Key Features

Module 2: Products & Inventory

- Product categories / subcategories with category-level custom fields

- Products with variants (size, colour, grade, etc.) and optional barcode
- Service Catalogue mode: no stock, just name + price + tax group
- Multi-warehouse stock with real-time levels and movements
- Stock receive, issue, adjustment, inter-branch transfer
- Opening stock entry for businesses migrating in
- Low stock thresholds triggering alert rules
- Inventory valuation (weighted average cost method)
- Bulk import via Excel template

Module 4: Sales & Invoicing

- Quotations → Sales Orders → Invoices with configurable workflow
- Bangladesh VAT calculation per line item based on tax group
- Mushak 6.3 VAT invoice auto-generated for VAT-registered companies (Pro+)
- Sales returns and credit notes (Mushak 6.6)
- Customer payments: cash, bKash, Nagad, card, bank transfer — partial payments
- Invoice PDF: watermarked (Free), clean branded bilingual (Pro+)
- Configurable number sequences per document type
- Customer ledger and ageing report

Module 7: HR & Payroll

- Employee profiles: personal info, NID, documents, emergency contact
- Departments, designations, reporting hierarchy
- Attendance: manual entry, CSV import from biometric devices
- Leave types (configurable), leave requests, approval workflow
- Configurable salary structures: any combination of earnings and deductions
- Bangladesh income tax auto-calculation (slab-based, annually updated)
- Wage board compliance for RMG factories
- Monthly payroll run with payslip PDF (bilingual)
- Bank payment list export for bulk salary transfer

Module 8: POS

- Dedicated fast-billing screen — separate from standard invoicing, speed-optimised
- Product search by name, code, or barcode scan (camera + USB scanner)
- Split payment: cash + bKash + Nagad + card in one transaction
- Receipt: PDF and thermal printer (58mm + 80mm)
- Real-time stock deduction and branch inventory update
- POS session management: open cash, close session, end-of-day reconciliation
- Works on tablet and desktop browsers

15. Bilingual Implementation

15.1 Language Architecture

Component	Implementation
Translation files	resources/lang/bn/ and resources/lang/en/ — all strings extracted to translation keys. No hardcoded visible text anywhere in the codebase.
Default language	Bangla (bn) as system default — detected from browser Accept-Language header on first visit
Per-company setting	Each company sets preferred language in Company Settings — overrides system default for all users of that company
Per-user setting	Individual users can override their personal language preference — overrides company default
Entity aliases	Entity alias system uses __entity() helper which respects language settings
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 — applied via Filament theme CSS
Database	UTF8mb4_unicode_ci on all tables — full Bangla character storage and sorting
Bangla numerals	Custom Laravel helper: bangla_number() converts Arabic to Bengali numerals (০,১,২) — toggled per company in settings
Date formatting	Carbon with Bangla month names — toggled per company. Format: ০০ ০০০০০০০০ ০০০০ or 12 January 2026
PDF generation	DomPDF configured with Noto Sans Bengali embedded font — all PDFs render Bangla correctly
Email templates	Both Bangla and English versions of every email template — sent in recipient's preferred language
Notification templates	All templates exist in both languages — sent in recipient's language preference
RTL readiness	CSS structure is RTL-compatible for future Arabic/Urdu expansion (Bangla is LTR)

15.2 Translation Coverage

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

AI tools (Claude 4, Cursor) will be used to generate the initial bn.json translation files from en.json. A native Bangla speaker must review and correct AI-generated translations before launch — AI Bangla translations are approximately 85% accurate and will have some awkward phrasing.

16. Development Plan (20 Weeks)

Designed for one developer using AI tools (Cursor + Claude 4 + GitHub Copilot). AI generates 70-80% of boilerplate. Developer writes architecture prompts, reviews output, corrects BD-specific rules, and handles the judgment-heavy 20%.

Daily AI Workflow

20. Write a precise architecture prompt: entity, relationships, fields, BD-specific business rules
21. AI generates migration, model, Filament resource, service class, and Pest tests
22. Review: fix business logic, BD compliance edge cases, bilingual string keys
23. Run tests — fix failures before moving on
24. Commit to Git → auto-deploy to staging server → verify manually → repeat

Phase 0: Environment & Architecture (Week 1)

Most important phase. Every hour here saves ten hours of refactoring later.

- Install Laravel 12, FilamentPHP v4, MySQL 8, Redis, Laravel Horizon, Laravel Reverb
- Configure stanc/tenancy with shared DB + company_id global Eloquent scope
- Configure Spatie Permission for per-company RBAC
- Configure UTF8mb4_unicode_ci on all tables
- Set up bilingual scaffolding: lang/bn and lang/en with __() and __entity() helpers from day one
- Install Noto Sans Bengali via Google CDN — apply in Filament theme
- Configure DomPDF with Bangla font embedding for PDF generation
- Set up Pest testing framework and GitHub Actions CI/CD
- Configure Sentry for error monitoring
- Create clean folder structure: App/Models, App/Services, App/Actions, App/Jobs, App/Policies
- Set Cursor rules: always use Filament v4 components, always add company_id scope, always use __() for strings, always write Pest tests, always follow BD VAT rules

Deliverable: Running app accessible in browser. Foundation confirmed correct. Nothing else.

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

- User registration, login, email verification, password reset
- Company creation wizard: step 1 (business details), step 2 (business type template selection), step 3 (first branch + number sequences setup)
- Entity alias system — loaded from business type template, editable in settings (Pro+)
- Company switcher in Filament navigation

- Branch management under each company
- Plans table and subscription model with JSON limits
- Usage counters table and Redis-backed atomic increment/decrement
- Full middleware stack: tenant scope, subscription status check, module access, feature flags
- Freemium enforcement: 3 company cap on Free, user count limits, module blocking
- Spatie roles and permissions per company (owner, admin, manager, accountant, hr_manager, pos_cashier, staff)
- User invitation: invite by email, accept invite, join company with role
- Company settings: logo, VAT registration toggle, BIN, address, language preference, Bengali numerals, invoice template style
- Number sequencing engine and configuration UI
- Superadmin panel foundation

Deliverable: User creates 3 companies (4th is blocked), switches between them, configures settings, entity aliases work throughout UI.

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

Build before any business module. Every module uses this from day one.

- Custom field definitions UI: all field types, per entity, per company
- Filament dynamic form renderer: renders custom fields inline in all forms
- Custom field values storage + generated column index system for filterable fields
- Custom field columns in list views with user toggle
- Visual workflow builder: add statuses, draw transitions, assign roles, configure automation
- Workflow state machine engine with automation runner
- Business type template loader: applies custom fields + workflows on company creation

Deliverable: Company admin adds custom fields to any entity and builds a workflow for any document type — no code required.

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

- Product categories / subcategories with category custom fields
- Products with variants, barcode generation, pricing, custom fields
- Service Catalogue mode (detected from business type template or set manually)
- Multi-warehouse stock management and movements
- Opening stock entry for migrating businesses
- Low stock thresholds feeding alert rules engine
- Inventory valuation (weighted average cost)
- Bulk import via Excel template with validation report

Deliverable: Full inventory management with custom fields, service mode, and real-time stock.

Phase 4: Purchasing & Suppliers (Week 8)

- Supplier profiles with TDS rate, credit terms, custom fields
- Purchase orders with configurable workflow, number sequencing
- Goods received (partial receive supported), stock auto-update
- Supplier payments with TDS/VDS deduction calculation
- Purchase returns with stock reversal
- Supplier ledger and ageing report

Deliverable: Full purchase cycle from PO through goods received and supplier payment with TDS.

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

- Customer profiles with credit terms, custom fields, entity alias applied
- Quotations and sales orders with configurable workflow
- Invoices with BD VAT calculation per line item (tax group based)
- Mushak 6.3 auto-generation for VAT-registered companies (Pro+)
- NBR-compliant invoice format and number sequencing
- Sales returns, credit notes (Mushak 6.6)
- Customer payments: partial payments, split payment types
- Invoice PDF: watermarked (Free), clean bilingual branded (Pro+)
- Customer ledger and ageing report

Deliverable: Full sales cycle with BD VAT compliance and bilingual PDF invoices.

Phase 6: Tax Engine (Week 10 continued)

- Tax groups configuration UI per company
- All BD VAT rates supported (15%, 10%, 7.5%, 5%, 2%, zero-rated, exempt)
- Tax calculation engine: standard, compound (SD + VAT), zero-rated, exempt
- Monthly VAT liability report: output VAT minus input VAT
- Mushak 6.2 (monthly sales register) and 6.1 (monthly purchase register) generation
- TDS/VDS auto-calculation on supplier payments and monthly remittance report
- Income tax slab table: configurable, annually updatable by superadmin

Deliverable: Company can calculate, report, and document their full BD tax obligations.

Phase 7: Expenses & Basic Accounting (Weeks 11–12)

- Expense categories (configurable), expense entry with receipt attachment
- Configurable approval workflow, petty cash, budget heads

- Chart of accounts (pre-configured by business type template)
- Auto journal entries from all sales, purchase, expense, payment transactions
- Accounts receivable and payable summaries
- Cash and bank account tracking
- P&L statement, balance sheet summary
- Manual journal entry for accountants

Deliverable: Business owner sees P&L, cash position, and receivables/payables in real time.

Phase 8: HR & Payroll (Weeks 13–14)

- Employee profiles with documents and custom fields
- Departments, designations, reporting structure
- Attendance: manual entry, CSV import from biometric
- Leave types and configurable approval workflow
- Configurable salary structure builder per company
- Monthly payroll run: full auto-calculation of all components
- Bangladesh income tax auto-calculation from tax slab table
- Wage board compliance tools for RMG factories
- Festival bonus management (Eid-ul-Fitr, Eid-ul-Adha)
- PF deduction and tracking
- Payslip PDF (bilingual — Bangla + English)
- Bank payment list export

Deliverable: Complete BD-compliant monthly payroll cycle including tax and PF.

Phase 9: Inter-Branch Operations (Week 15)

- Branch-level access control applied to all modules
- Stock transfer document with configurable workflow (Created → In Transit → Received)
- Partial receipt on stock transfers
- Branch-level reports and consolidated company-level reports
- Branch comparison widget on dashboard
- POS multi-branch stock visibility (configurable)

Phase 10: POS + Batch/Expiry + CRM (Week 16)

- Dedicated fast POS screen (tablet and desktop)
- Split payment, receipt generation (PDF + thermal)
- POS session management and end-of-day reconciliation
- Batch number and expiry date tracking on stock receive
- FEFO stock issue logic, expiry alert rules integration
- Batch traceability report
- CRM module (Pro+): enhanced customer profiles, follow-up reminders, segmentation

Phase 11: Notification System + Alert Rules (Week 17)

- Alert rules engine: full UI for creating trigger conditions and notification targets
- Real-time in-app notifications via Reverb + Echo (toast + notification centre)
- Notification template system: bilingual templates with variable substitution
- Email notifications with bilingual template rendering
- Notification preferences per user
- Scheduled report delivery (queued jobs + email)
- SMS structure in place — gateway integration post-MVP

Phase 12: Subscription Billing Integration (Week 17 continued)

- SSLCommerz card payment integration
- bKash Business gateway for subscription payment
- Plan upgrade/downgrade flow with conflict resolution on downgrade
- Subscription invoice generation
- Payment webhook handling and instant plan activation
- 7-day grace period logic and escalating expiry emails
- Superadmin subscription management panel

Phase 13: API Layer (Week 18)

- REST API v1 with all core endpoints
- Sanctum token management with scopes
- Multi-tenancy in API context (token identifies user + company)
- Rate limiting: 1,000/hr (Pro), 10,000/hr (Enterprise), blocked (Free)
- API activity log
- Webhook system (Enterprise): subscribe to events, delivery with retry, webhook log
- API documentation (auto-generated via Scramble or similar)

Phase 14: Data Migration Tools (Week 18 continued)

- Excel import templates for all major entities
- Validation engine: row-level error report before import confirmation
- Background job processing for large imports
- Import history log
- Opening balance import for accounts receivable and payable

Phase 15: Audit Log (Week 19)

- audit_logs table with monthly partitioning
- Async audit log writes via queued jobs

- Audit log UI with filtering, search, and diff view
- Export to Excel (Pro+) and PDF (Enterprise)
- Nightly pruning job for Free plan companies (30-day retention)

Phase 16: Testing, Performance & Polish (Week 19 continued)

- Pest test coverage: all API endpoints, all report jobs, all payroll calculations, all VAT calculations, all workflow transitions
- Database indexing review — all foreign keys, all filter columns, all custom field generated columns
- Redis caching for dashboard widgets, reports, and subscription context
- Query optimisation: eager loading everywhere, zero N+1 queries
- Full Bangla translation review (AI-generated strings reviewed by native speaker)
- Bengali numerals and Bangla date formatting tested on all PDFs
- Mobile responsiveness check — all Filament resources
- Security review: tenant isolation testing, rate limiting, HTTPS enforcement, input sanitisation, file upload validation
- Empty states and loading states in all list views
- User-friendly error messages replacing all technical errors

Phase 17: Pre-Launch (Week 20)

- Demo data for 3 scenarios: small retail shop, pharmacy with batch/expiry + Mushak VAT, 50-person company with HR/payroll
- 5-minute onboarding wizard: business type → company details → first branch → key settings → done
- Public landing page: features, pricing table, demo video embeds, free signup CTA
- Bangla demo videos recorded (one per target business type)
- VPS deployment: XeonBD/Alpha Net, HTTPS, domain, Sentry monitoring
- Beta launch: 10–20 initial users from different business types, structured feedback collection

17. Timeline Summary

Phase	Focus	Weeks	Deliverable
0	Environment & Architecture	1	Running app, clean structure, bilingual scaffold
1	Multi-Company + Subscription Engine	2–3	Company creation, switching, plan enforcement, entity aliases, number sequences
2	Dynamic Fields + Workflow Engine	4–5	Custom fields and workflow builder on all entities
3	Products & Inventory	6–7	Full inventory with service mode
4	Purchasing & Suppliers	8	Full purchase cycle with TDS/VDS
5	Sales & Invoicing	9–10	Full sales cycle with BD VAT and Mushak compliance
6	Tax Engine	10 (cont.)	All BD tax types configured and reporting
7	Expenses + Basic Accounting	11–12	P&L, balance sheet, accounts receivable/payable
8	HR & Payroll	13–14	BD-compliant payroll with income tax and wage board
9	Inter-Branch Operations	15	Stock transfers, branch reporting, branch access control
10	POS + Batch/Expiry + CRM	16	Fast POS, expiry tracking, basic CRM (Pro+)
11	Notifications + Alert Rules	17	Real-time alerts, bilingual notification templates
12	Subscription Billing	17 (cont.)	SSLCommerz + bKash payment, upgrade/downgrade flow
13	API Layer	18	REST API v1, token management, webhooks (Enterprise)
14	Data Migration Tools	18 (cont.)	Excel import for all major entities with validation
15	Audit Log	19	Full audit trail with UI, filtering, retention
16	Testing + Performance + Polish	19 (cont.)	95%+ test coverage, optimised queries, Bangla review
17	Pre-Launch	20	Demo data, onboarding wizard, landing page, VPS deploy, beta

Total: 20 weeks. Phases 0, 1, and 2 are the foundation — they must be completed exactly as sequenced because every later phase depends on them. Phases 3–16 follow in order but some can be parallelised if additional developer capacity becomes available.

18. Post-MVP Roadmap

Everything in this section is explicitly out of scope for the 20-week MVP. Priority order will be determined by actual user feedback and revenue generated after launch.

18.1 Immediate Post-Launch (Months 1–3)

- SMS notification gateway (SSL Wireless or bDBL)
- WhatsApp Business notification support
- Advanced POS: table management for restaurants, kitchen display system
- Enhanced accounting: full double-entry with trial balance and multi-period comparison
- Biometric device direct integration (ZKTeco API)
- Multi-currency support
- Gratuity calculation (Bangladesh Labour Law)

18.2 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 targets
- Asset Management: company assets, depreciation, maintenance schedule
- Project Management: costing, resource allocation, milestones, client billing
- Custom Report Builder (full visual drag-and-drop, no-code)
- White-labeling: resellers can offer GenERP BD under their own brand
- EBTIDA / advanced financial analysis reports
- NBR online VAT return filing integration (when NBR API becomes available)

18.3 AI Features (Investment Required — Post-Revenue)

AI features require significant infrastructure investment (GPU compute, model hosting or API costs, data engineering). These will only be built once GenERP BD generates sufficient recurring revenue. No AI features are promised at MVP launch or to early customers.

- AI-powered sales forecasting and demand prediction (based on historical patterns)
- AI anomaly detection: unusual expenses, suspicious transactions, unexpected stock loss
- Natural language report generation: "Show me last month's top 10 customers by revenue"
- AI-assisted payroll discrepancy detection
- AI business health score and recommendations on dashboard
- Chatbot for in-app support (answers questions about how to use the platform)

19. Hosting & Infrastructure

19.1 MVP Hosting

Component	Solution	Est. Monthly Cost
Web + App Server	XeonBD or Alpha Net VPS (BD-based, low latency)	1,500–3,000 BDT
Database	MySQL 8 on same VPS initially	Included
Cache / Queue	Redis on same VPS	Included
File Storage	Local server storage → migrate to S3-compatible (Wasabi/DO Spaces) when >20 GB	Included (VPS) → ~500 BDT/mo at scale
Transactional Email	Mailgun or AWS SES	~500–1,000 BDT/mo
SSL Certificate	Let's Encrypt (free, auto-renewing)	Free
Error Monitoring	Sentry free tier	Free
Domain	.com or .com.bd	~1,000–2,000 BDT/year
CDN	Cloudflare free tier — static assets and DDoS protection	Free

19.2 Infrastructure Scale Path

As customers grow: (1) Separate database server when concurrent queries impact performance. (2) Managed Redis cluster when queue volume increases. (3) Object storage (Wasabi/S3) for all file uploads when local storage exceeds practical limits. (4) Dedicated servers for Enterprise clients with data sovereignty requirements. (5) Read replicas for reporting queries when report generation slows the main database.

19.3 Security Requirements

- HTTPS enforced on all routes — HTTP permanently redirects to HTTPS
- Tenant isolation: every DB query is company-scoped — cross-company data access is architecturally impossible, not just policy
- Rate limiting on all API routes, login endpoints, and password reset endpoints
- Input sanitisation and XSS protection (Laravel default + Filament + custom middleware)
- File upload validation: type whitelist, size limits, malware scanning before storage
- Password hashing: bcrypt with sufficient cost factor
- CSRF protection on all web routes, secure session cookies
- SQL injection prevention: Eloquent ORM parameterised queries only — no raw queries with user input
- Audit trail on all sensitive operations

- Automated daily backups: database dump + file storage, retained 30 days, stored off-server
- Backup restoration tested monthly

20. Launch Strategy

20.1 Beta Launch (End of Week 20)

Before public launch, recruit 10–20 beta users across different business types. Minimum representation: 2 retail shops, 1 pharmacy, 1 garments or manufacturing company, 1 service business, 1 solo entrepreneur. Offer free Pro plan for 3 months in exchange for honest feedback, bug reports, and willingness to be a reference customer. Fix all critical issues before public launch.

20.2 Public Launch

- Landing page: features, pricing table, Bangla demo video embeds, free signup CTA, live chat
- Bangla demo videos on YouTube: one per business type (retail, pharmacy, RMG/HR, solo entrepreneur, service business)
- Facebook ads targeting BD business owners (primary acquisition channel for SME market)
- YouTube tutorial series in Bangla (module-by-module walkthroughs)
- BD tech influencer / business YouTuber outreach
- Facebook group presence: BD business, accounting, ERP groups
- Product Hunt launch (English) for developer / startup audience

20.3 Free-to-Paid Conversion Strategy

Free tier limits are designed to create natural upgrade moments as the business grows. The 3-company cap, 3-user-per-company cap, 500-SKU limit, watermarked PDFs, and blocked report exports are the primary conversion triggers. A growing business will naturally hit at least one of these within 3–6 months of active use. The upgrade prompt at each limit is an invitation, not a wall — showing clearly what they get by upgrading.