NexInvo

by Chinmay Technosoft Private Limited

Complete GST-Ready Invoicing SaaS Platform
Development Specification for Claude Code Implementation

Product & Company Overview

Product Name: NexInvo - Next-Generation GST Invoicing Platform
Company: Chinmay Technosoft Private Limited
Business Model: Software as a Service (SaaS) platform for CA practices and SMEs
Target Market: Chartered Accountant firms, SMEs, and businesses requiring GST-compliant invoicing in India

🔧 **Technology Stack:** Python 3.13.5 (Django 5.x + DRF), PostgreSQL 16+, React 18+ TypeScript, Ubuntu 24 + Nginx + systemd

🔗 **Core Integrations:** Tally Prime XML, Zoho Books API, Dynamics 365, e-Invoice IRP, GSTR-1/3B Export, Multi-channel Payment Reminders

CLAUDE CODE IMPLEMENTATION INSTRUCTIONS

IMPORTANT: This is a comprehensive development specification for Claude Code to implement the complete NexInvo platform. Follow each phase sequentially with complete testing before proceeding to the next phase.

Implementation Approach for Claude Code

1. **Backend Development:** Complete Django application with all models, APIs, business logic, and integrations
2. **Frontend Development:** React TypeScript application with modern UI/UX, responsive design, and complete user workflows
3. **UI/UX Design:** Professional interface design with Tailwind CSS, shadcn/ui components, and CA practice-optimized layouts
4. **System Integration:** All external integrations including Tally, Zoho, e-Invoice IRP, and automation platforms
5. **Documentation:** Complete API documentation, deployment guides, user manuals, and system administration documentation

Core Business Requirements

Primary Business Goals

- Multi-tenant SaaS platform for GST-compliant invoicing designed specifically for CA practices and SMEs
- Complete GST Rule-46 compliance with dynamic rate management, HSN/SAC validation, and audit trails
- Professional invoice templates with visual drag-drop designer and brand customization
- Full e-Invoice IRP integration with complete lifecycle management (generate, submit, cancel, track)
- B2C Dynamic QR codes for UPI payments with intelligent placement logic
- Automated payment reminder system with multi-channel support and auto-stop on payment
- Enterprise ERP integrations: Tally Prime XML export, Zoho Books OAuth2, Dynamics 365 APIs
- GSTR-1, GSTR-3B preparation and export with reconciliation capabilities
- CA practice features: client segregation, digital signatures, professional compliance, audit trails

Technical Architecture Specification

System Architecture (Non-Docker Ubuntu Deployment)

Layer	Technology	Implementation Requirements
Backend API	Django 5.x + DRF + Python 3.13.5	REST API with OAuth2, JWT tokens, comprehensive business logic, GST compliance engine, multi-tenant RLS
Frontend App	React 18+ TypeScript + Vite	Modern SPA with Tailwind CSS, shadcn/ui, React Query, responsive design, PWA capabilities
Database	PostgreSQL 16+ with RLS	Row Level Security for tenant isolation, optimized for financial data, automated backups, audit logging
Background Jobs	Celery + Redis	Email sending, IRP submissions, ERP sync, payment reminders, PDF generation queue
File Storage	Local + Cloud Backup	Local storage for performance, automated cloud sync for disaster recovery, tenant-isolated directories

Complete Data Model Specification

All tables must include: tenant_id, created_at, updated_at, created_by, updated_by for complete audit trails and multi-tenancy.

Table Name	Fields & Business Logic
tenants	id, name, business_type (ca_firm/sme/enterprise), aato_threshold, e_invoice_enabled, b2c_qr_enabled, company_details (JSON: GSTIN, address, logo), gst_settings (JSON: rates, compliance rules), subscription_plan, billing_details
users	Django User model extended with: phone, designation, ca_registration_no, digital_signature_cert, two_factor_enabled, last_login_ip
tenant_memberships	user_id, tenant_id, role (ca_owner/admin/finance_user/viewer/client_readonly), permissions (JSON), joined_at, invited_by, is_active
clients	tenant_id, name, client_code, client_type (b2b/b2c), gstin, pan, email, phone, billing_address (JSON), shipping_address (JSON), state_code, pos_default, credit_terms_days, bank_details (JSON), contact_persons (JSON)
items	tenant_id, name, item_code, sku, description, hsn_sac, uqc, default_rate, current_gst_rate, current_cess_rate, item_category, is_service, is_active
gst_rate_history	item_id, hsn_sac, effective_from, effective_to, cgst_rate, sgst_rate, igst_rate, cess_rate, notification_reference, change_reason
invoices	tenant_id, client_id, invoice_type (proforma/taxable), series, number, date, due_date, place_of_supply, reverse_charge, currency, exchange_rate, subtotal, discount_amount, taxable_amount, total_tax, round_off, grand_total, payment_status, notes, terms_conditions
invoice_lines	invoice_id, item_id, line_number, description, hsn_sac, quantity, uqc, rate, discount_percent, discount_amount, taxable_value, cgst_rate, sgst_rate, igst_rate, cess_rate, cgst_amount, sgst_amount, igst_amount, cess_amount, line_total
einvoice_details	invoice_id, irp_status, irn, ack_no, ack_date, qr_code_image, signed_invoice_hash, irp_request_payload (JSON), irp_response_payload (JSON), cancellation_date, cancellation_reason

Table Name	Fields & Business Logic
invoice_templates	tenant_id, name, template_type (invoice/email), html_template, css_styles, json_layout (drag-drop config), is_default, is_system_template, mandatory_fields (JSON), preview_image
email_communications	tenant_id, invoice_id, to_email, cc_email, bcc_email, subject, body, attachment_paths (JSON), status, provider_message_id, sent_at, delivered_at, opened_at, bounce_reason, retry_count
payment_reminders	tenant_id, invoice_id, reminder_type (gentle/firm/final/custom), schedule_rule (JSON), channel (email/sms/whatsapp), template_id, status, last_sent_at, next_send_at, auto_stop_enabled, max_attempts, custom_message
integrations	tenant_id, integration_type (tally/zoho/d365/smtp/webhook), name, credentials_encrypted (JSON), configuration (JSON), is_active, last_sync_at, sync_status, error_log, webhook_secret
audit_logs	tenant_id, user_id, entity_type, entity_id, action, before_data (JSON), after_data (JSON), ip_address, user_agent, session_id, is_financial_transaction, compliance_relevant, timestamp

Complete API Specification

Base URL: /api/v1/ • Authentication: JWT + OAuth2 • All POST requests require Idempotency-Key header

Endpoint	Methods	Business Logic & Features
/auth/login, /auth/token, /auth/refresh	POST	JWT authentication, 2FA for CA users, session management, role-based access control
/tenants/me, /tenants/settings	GET/PATCH	Tenant profile, GST settings, branding configuration, subscription management
/clients, /clients/{id}	CRUD	Client management, GSTIN validation, address management, credit terms, bulk operations

Endpoint	Methods	Business Logic & Features
/items, /items/{id}, /items/bulk	CRUD	Item master, HSN/SAC management, rate history tracking, bulk import/export
/invoices, /invoices/{id}	CRUD	Invoice creation with auto-GST calculation, Rule-46 validation, sequence management
/invoices/{id}/pdf	GET	PDF generation with template selection, QR code embedding, digital signatures
/invoices/{id}/email	POST	Email delivery with attachment, delivery tracking, bounce handling
/invoices/{id}/einvoice/submit	POST	e-Invoice IRP integration, INV-01 JSON generation, IRN/QR storage
/invoices/{id}/sync/{integration}	POST	ERP synchronization (Tally XML, Zoho API, Dynamics 365)
/gstr/export	GET	GSTR-1, GSTR-3B export in CSV/JSON format with reconciliation data
/reminders, /reminders/{id}/schedule	CRUD	Payment reminder automation with multi-channel support, auto-stop logic
/templates, /templates/{id}/validate	CRUD	Template management, drag-drop designer, mandatory field validation
/webhooks/{tenant_id}	POST	Webhook endpoints for external automation platforms (Make, Zapier, n8n)

Frontend UI/UX Requirements

Core User Interface Components

- **Authentication & Onboarding:** Modern login/signup flows, tenant setup wizard, role-based dashboards, 2FA setup for CA users
- **Dashboard & Analytics:** Revenue analytics, GST liability forecasting, client-wise reports, payment aging, compliance status

- **Invoice Management:** Invoice creation wizard, line item management, tax calculation preview, template selection, bulk operations
- **Template Designer:** Drag-drop visual editor, real-time preview, brand customization, template library, validation feedback
- **Client & Item Management:** Data grid with search/filter, bulk import/export, address management, relationship tracking
- **Compliance Center:** GST filing calendar, compliance checklists, e-Invoice status, GSTR preparation, audit trails
- **Integration Hub:** ERP connection setup, sync status monitoring, webhook configuration, API key management
- **Settings & Administration:** Tenant configuration, user management, billing settings, security preferences, backup management

Design System & Branding

- **Color Scheme:** Professional blue theme (#1B365D, #2E5984) with gold accents (#D4AF37) for premium features
- **Typography:** Arial font family for universal compatibility and professional appearance
- **Component Library:** shadcn/ui components with Tailwind CSS for consistent, accessible design
- **Responsive Design:** Mobile-first approach with tablet and desktop optimizations for CA practice workflows
- **Accessibility:** WCAG 2.1 AA compliance, keyboard navigation, screen reader support, high contrast mode

10-Week Implementation Roadmap

IMPORTANT FOR CLAUDE CODE: Implement each phase completely with testing before proceeding. Each phase builds upon the previous one.

Phase	Implementation Requirements	Success Criteria
Phase 0 (Week 1)	Project setup: Django backend with PostgreSQL RLS, React TypeScript frontend, authentication system, basic tenant isolation, systemd services configuration	✓ Two tenants with proven data isolation ✓ Basic login/signup flows working ✓ All services auto-start and restart
Phase 1 (Weeks 2-3)	Core invoice system: Client/item CRUD, invoice creation with GST calculations, PDF generation with 2 templates, email system with tracking, logo/branding	✓ Accurate CGST/SGST/IGST calculations ✓ Professional PDF generation ✓ Email delivery with attachments

Phase	Implementation Requirements	Success Criteria
Phase 2 (Weeks 4-5)	GST compliance engine: Rule-46 validation, HSN/SAC enforcement, rate history, payment reminders, CA features (digital signatures, audit trails)	✓ AATO triggers HSN validation ✓ Reminders auto-stop on payment ✓ Complete audit trails functional
Phase 3 (Weeks 6-7)	ERP integrations: Tally Prime XML export, Zoho Books OAuth2, Dynamics 365 APIs, webhook system for automation platforms, sync status tracking	✓ Tally XML imports successfully ✓ Zoho sync with identical values ✓ Webhooks delivered reliably
Phase 4 (Weeks 8-9)	e-Invoice & QR systems: IRP integration with INV-01 JSON, B2C Dynamic QR for UPI, QR placement logic, cancellation workflows	✓ Valid IRN and QR from IRP ✓ QR codes scan correctly ✓ Cancellation within time window
Phase 5 (Week 10)	Production ready: GSTR-1/3B export, security hardening, performance optimization, monitoring setup, complete documentation, testing	✓ GSTR exports match totals ✓ Security tests pass ✓ 100+ concurrent users supported

External Integration Specifications

Tally Prime Integration

- **XML Export Format:** Generate compliant Tally XML with complete GST breakdown, ledger mappings, and tax allocations
- **Data Mapping:** Map NexInvo invoices to Tally sales vouchers with proper party ledgers and tax calculations
- **Export Options:** Download XML files or direct POST to Tally Gateway URL for automatic import

Zoho Books Integration

- **OAuth2 Flow:** Complete OAuth2 implementation for secure API access with token refresh
- **Data Sync:** Bidirectional sync of customers, items, and invoices with conflict resolution
- **Status Tracking:** Monitor sync status, store Zoho IDs, handle API rate limits and errors

e-Invoice IRP Integration

- **INV-01 JSON Generation:** Create compliant e-invoice JSON payload with all mandatory fields

- **IRP Communication:** Secure API calls to IRP with authentication, error handling, and retry logic
- **QR Code Management:** Store and embed signed QR codes in PDF invoices with proper placement

Security & Compliance Requirements

Data Security

- **Encryption:** All PII data encrypted at rest, TLS 1.3 for data in transit, encrypted database backups
- **Access Control:** Role-based permissions, 2FA for CA users, session management, IP whitelisting
- **Audit Logging:** Complete audit trails for all financial transactions with immutable logs

GST Compliance

- **Rule-46 Validation:** Real-time validation of all 15 mandatory fields for taxable invoices
- **HSN/SAC Enforcement:** Automatic digit validation based on annual turnover thresholds
- **Rate Management:** Historical rate tracking with effective dates for audit compliance

Documentation Requirements

CRITICAL: Claude Code must generate complete documentation as the final step of implementation.

Technical Documentation

- **API Documentation:** Complete OpenAPI/Swagger documentation with examples, authentication details, and error codes
- **Database Schema:** ERD diagrams, table relationships, indexes, constraints, and migration guides
- **Deployment Guide:** Step-by-step Ubuntu deployment instructions, systemd configuration, security hardening
- **Integration Guides:** Detailed setup instructions for Tally, Zoho, Dynamics 365, and webhook integrations

User Documentation

- **User Manual:** Comprehensive guide for CA practices and SMEs with screenshots and workflows
- **Admin Guide:** System administration, tenant management, backup procedures, security settings
- **Compliance Guide:** GST compliance checklist, e-invoice setup, GSTR preparation procedures

- **Troubleshooting:** Common issues, error resolution, FAQ, and support procedures

Quality & Testing Standards

Code Quality Requirements

- **Python Standards:** PEP 8 compliance, type hints, comprehensive docstrings, 80%+ test coverage
- **TypeScript Standards:** Strict mode enabled, complete interface definitions, proper component typing
- **Security Standards:** No PII in logs, encrypted credentials, SQL injection prevention, CSRF protection

Testing Requirements

- **Unit Tests:** Comprehensive test coverage for all business logic, GST calculations, and compliance rules
- **Integration Tests:** API endpoint testing, database operations, external service integrations
- **Security Tests:** Tenant isolation verification, access control testing, vulnerability assessments

Final Success Metrics

Category	Target Metric	Verification Method
Performance	100+ concurrent users, <2s API response, <5s PDF generation	Load testing with automated tools, performance monitoring
Security	Zero tenant data leakage, complete audit trails, encrypted PII	Penetration testing, tenant isolation verification, security audit
Compliance	100% GST Rule-46 compliance, successful IRP integration	CA firm validation, IRP test transactions, compliance audit
Integration	Tally, Zoho, D365 sync 100% successful, reliable webhooks	Real-world testing with partner systems, sync verification

FINAL INSTRUCTIONS FOR CLAUDE CODE

IMPLEMENTATION ORDER:

6. **Backend Development:** Start with Django backend, implement all models, APIs, business logic, and integrations according to the data model and API specifications
7. **Frontend Development:** Build React TypeScript application with all UI components, responsive design, and complete user workflows
8. **Integration Implementation:** Implement all external integrations (Tally, Zoho, e-Invoice IRP, webhooks) with proper error handling
9. **Testing & Quality:** Comprehensive testing including unit tests, integration tests, and security verification
10. **Documentation:** Generate complete technical and user documentation as specified in the documentation requirements

QUALITY CHECKPOINTS:
- Test each phase thoroughly before proceeding to the next
- Verify tenant isolation at every development step
- Validate GST calculations with real-world scenarios
- Ensure professional UI/UX meets CA practice standards
- Complete security testing before final delivery

Project Summary

NexInvo by Chinmay Technosoft Private Limited represents a complete GST-ready invoicing SaaS platform designed specifically for the Indian market. This comprehensive specification provides everything needed to build a production-ready system that serves CA practices and SMEs with enterprise-grade functionality at SME-friendly pricing.

Key Differentiators:
- Complete GST compliance with Rule-46 validation and dynamic rate management
- CA practice-optimized features with professional compliance and audit capabilities
- Cost-effective non-Docker deployment with 40-50% infrastructure savings
- Enterprise ERP integrations with Tally, Zoho, and Dynamics 365
- Modern, responsive UI/UX designed for accounting professionals

Expected Outcome: A market-ready SaaS platform that positions Chinmay Technosoft as a leader in GST-compliant business software for the Indian market, with significant competitive advantages in cost-effectiveness and professional feature set.