TeamACE

CRM-ERP Platform

Comprehensive Business Management Solution
for HR Outsourcing & Professional Services

Prepared by

Rozitech (Pty) Ltd

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TeamACE CRM-ERP Platform

Software Requirements Specification

Phase 1: Foundation Modules

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Document Information

Prepared By	Rozitech (Pty) Ltd
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Project	CRM-ERP Platform Development
Phase	Phase 1 — Foundation Modules
Duration	12 Sprints (~24 weeks)

Phase 1 Modules

Module	Description	Priority
1.1	Core CRM & Client Management	High
1.2	Business Development Essentials	High
1.3	HR Outsourcing Essentials	High
1.4	Finance Light (Invoicing)	Medium
1.5	Collaboration & Workflow	Medium

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Software Requirements Specification (SRS)

TeamACE CRM-ERP Platform - Phase 1: Foundation Modules

Document Version: 1.0 **Date:** November 30, 2025 **Status:** Draft for Partner Review **Prepared by:** Rozitech Development Team

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1. Introduction

1.1 Purpose

This Software Requirements Specification (SRS) document defines the complete functional and non-functional requirements for Phase 1 (Foundation Modules) of the TeamACE CRM-ERP Platform. Phase 1 establishes the root-level entities and core functionality upon which all subsequent phases depend.

This document serves as the authoritative reference for: - Development team implementation guidance - Quality assurance test case derivation - Partner acceptance criteria validation - Project scope and boundary definition

1.2 Scope

Phase 1 encompasses five interconnected foundation modules:

Module	Description	Effort	Reuse Level
1.1 Core CRM & Client Management	Central client database, contacts, engagements	3-4 sprints	60% (InvoiceFlow)
1.2 Business Development	Lead management, sales pipeline, proposals	3-4 sprints	50% (Workforce)
1.3 HR Outsourcing Essentials	Staff deployment, client assignments	2-3 sprints	80% (Workforce)
1.4 Finance Light	Invoicing, payments, receivables	2-3 sprints	70% (InvoiceFlow)
1.5 Collaboration & Workflow	Notes, approvals, notifications, tasks	2-3 sprints	40% (Workforce)

Total Phase 1 Duration: 12 sprints (~24 weeks / 6 months)

1.3 Definitions, Acronyms, and Abbreviations

Term	Definition
CRM	Customer Relationship Management
ERP	Enterprise Resource Planning
JWT	JSON Web Token
CRUD	Create, Read, Update, Delete
RBAC	Role-Based Access Control
SaaS	Software as a Service
API	Application Programming Interface
UUID	Universally Unique Identifier
JSONB	JSON Binary (PostgreSQL data type)
PAYE	Pay As You Earn (Nigeria tax)
VAT	Value Added Tax
WHT	Withholding Tax
TIN	Tax Identification Number

Term	Definition
BD	Business Development
HR	Human Resources
ESS	Employee Self-Service
SLA	Service Level Agreement
KPI	Key Performance Indicator
OCR	Optical Character Recognition

1.4 References

- TeamACE CRM-ERP Development Plan v1.0 (November 29, 2025)
- Rozitech Workforce Application Technical Documentation
- Rozitech InvoiceFlow Application Technical Documentation
- Rozitech Auth Server API Specification
- Nigeria Federal Inland Revenue Service (FIRS) Guidelines
- Nigeria Companies and Allied Matters Act (CAMA) 2020

1.5 Document Overview

This SRS is organized into twelve sections:

- **Sections 1-2:** Introduction and overall system description
- **Sections 3-7:** Detailed functional requirements for each Phase 1 module
- **Sections 8-11:** Data, non-functional, interface, and security requirements
- **Section 12:** Appendices with supplementary technical details

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2. Overall Description

2.1 Product Perspective

TeamACE CRM-ERP is a comprehensive business management platform designed specifically for HR consulting and outsourcing firms operating in Nigeria. The system integrates customer relationship management, business development, human resource outsourcing, and financial management into a unified platform.

Architecture Layers:

- **Presentation Layer**: React 18 single-page application with Tailwind CSS for responsive design
- **API Gateway Layer**: Express.js RESTful API with JWT-based authentication
- **Business Logic Layer**: Five specialized modules handling CRM, sales, HR, finance, and workflow
- **Data Access Layer**: Knex.js query builder with connection pooling
- **Database Layer**: PostgreSQL with multi-tenant schema isolation

2.2 Product Functions Summary

Module	Primary Functions
Core CRM	Client profiles, contact management, engagement tracking, document management, activity logging
Business Development	Lead capture, sales pipeline, proposal management, revenue forecasting, bulk communications
HR Outsourcing	Staff-client assignments, deployment tracking, contract management, service logging

Module	Primary Functions
Finance Light	Invoice generation, payment tracking, receivables management, financial reporting
Collaboration	Notes, comments, approval workflows, notifications, task management

2.3 User Classes and Characteristics

User Class	Description	Primary Access
System Administrator	Platform operator with full access	All modules, system configuration
Managing Director	C-level executive oversight	Dashboard, reports, approvals
Business Development Manager	Sales and BD team lead	CRM, BD, proposals
Account Manager	Client relationship owner	CRM, engagements, service logs
HR Manager	HR operations team lead	HR outsourcing, staff management
Payroll Administrator	Payroll processing staff	Finance, payroll integration
Finance Manager	Financial operations	Invoicing, payments, reports
Staff Member	General employee	ESS, assigned tasks
External Auditor	Read-only compliance review	Reports, audit trails

2.4 Operating Environment

Component	Specification
Backend Runtime	Node.js 18+ LTS
Web Framework	Express.js 4.x
Database	PostgreSQL 14+ with UUID and JSONB support
Frontend Framework	React 18.x with Vite build tool
CSS Framework	Tailwind CSS 3.x
Authentication	JWT with multi-tenant support
Deployment	Docker containers on Render.com
Supported Browsers	Chrome, Firefox, Safari, Edge (latest 2 versions)
Mobile Support	Responsive design (PWA-ready)

2.5 Design and Implementation Constraints

1. **Multi-tenancy:** Schema-based separation per tenant organization
2. **Reuse Priority:** Maximize adaptation of existing Rozitech modules (Workforce, InvoiceFlow)
3. **Whitelabel Ready:** Configurable branding (logo, colors, company name)
4. **Nigeria Focus:** Tax calculations, currency (NGN), banking formats per Nigerian standards
5. **Audit Compliance:** Full audit trail for all data modifications
6. **API-First:** All functionality exposed via RESTful API
7. **Offline Awareness:** Graceful degradation for intermittent connectivity

2.6 Assumptions and Dependencies

Assumptions: - TeamACE operates primarily within Nigeria - Users have modern web browsers and stable internet access - Client companies have standard organizational structures - Financial data requires reconciliation with external accounting systems

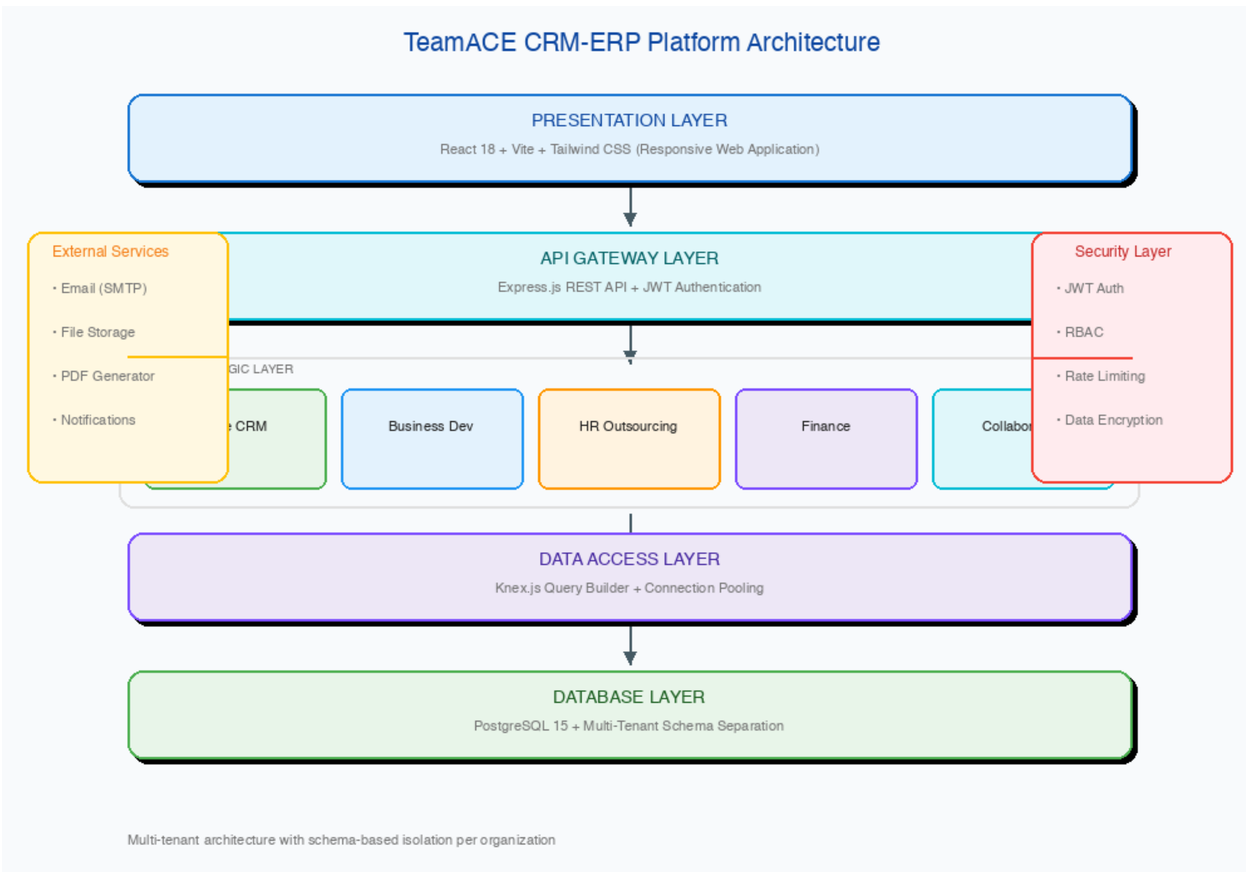

Figure 1: Platform Architecture

Dependencies: - Rozitech Auth Server for authentication and authorization - Email service provider (SendGrid/Mailgun) for notifications - Cloud storage service for document management - SMS gateway for Nigeria mobile notifications (future)

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3. Module 1.1: Core CRM & Client Management

3.1 Module Overview

The Core CRM & Client Management module establishes the central client database that serves as the foundation for all client-related operations across the platform. This module manages company profiles, key contacts, client engagements/projects, document storage, and interaction logging.

Priority: CRITICAL - Build First **Estimated Effort:** 3-4 sprints (6-8 weeks) **Reuse Source:** InvoiceFlow client model (60%)

3.2 Data Entities

3.2.1 Clients Entity

Field	Type	Constraints	Description
id	UUID	PK, auto-generated	Unique client identifier
organization_id	UUID	FK, NOT NULL	Tenant organization
company_name	VARCHAR(255)	NOT NULL	Legal company name
trading_name	VARCHAR(255)		Trading/DBA name
industry	VARCHAR(100)		Industry sector
company_size	ENUM		micro/small/medium/large/enterprise
registration_number	VARCHAR(50)		CAC registration number
tax_id	VARCHAR(50)		Tax Identification Number
vat_number	VARCHAR(50)		VAT registration number
website	VARCHAR(255)		Company website URL
logo_url	VARCHAR(500)		Company logo storage path
address_line1	VARCHAR(255)		Primary address
address_line2	VARCHAR(255)		Secondary address
city	VARCHAR(100)		City
state	VARCHAR(100)		State/Region
country	VARCHAR(100)	DEFAULT ‘Nigeria’	Country
postal_code	VARCHAR(20)		Postal/ZIP code
phone	VARCHAR(50)		Primary phone
email	VARCHAR(255)		Primary email
client_type	ENUM	NOT NULL	prospect/active/inactive/former
client_tier	ENUM		standard/premium/enterprise
account_manager_id	UUID	FK	Assigned account manager
credit_limit	DECIMAL(15,2)		Credit limit in NGN
payment_terms	INTEGER	DEFAULT 30	Payment terms (days)
contract_start_date	DATE		Contract start date
contract_end_date	DATE		Contract end date
notes	TEXT		Internal notes
custom_fields	JSONB		Tenant-specific custom fields
created_by	UUID	FK	Creator user ID
created_at	TIMESTAMP	DEFAULT NOW()	Creation timestamp
updated_at	TIMESTAMP		Last update timestamp
deleted_at	TIMESTAMP		Soft delete timestamp

3.2.2 Contacts Entity

Field	Type	Constraints	Description
id	UUID	PK, auto-generated	Unique contact identifier
organization_id	UUID	FK, NOT NULL	Tenant organization
client_id	UUID	FK, NOT NULL	Parent client
first_name	VARCHAR(100)	NOT NULL	First name
last_name	VARCHAR(100)	NOT NULL	Last name
job_title	VARCHAR(100)		Job title/position
department	VARCHAR(100)		Department
email	VARCHAR(255)		Email address
phone	VARCHAR(50)		Direct phone
mobile	VARCHAR(50)		Mobile phone
linkedin_url	VARCHAR(500)		LinkedIn profile
is_primary	BOOLEAN	DEFAULT FALSE	Primary contact flag
is_decision_maker	BOOLEAN	DEFAULT FALSE	Decision maker flag
is_billing_contact	BOOLEAN	DEFAULT FALSE	Billing contact flag
contact_preferences	JSONB		Preferred contact methods
birthday	DATE		Birthday (for relationship building)
notes	TEXT		Personal notes
created_at	TIMESTAMP	DEFAULT NOW()	Creation timestamp
updated_at	TIMESTAMP		Last update timestamp
deleted_at	TIMESTAMP		Soft delete timestamp

3.2.3 Engagements Entity

Field	Type	Constraints	Description
id	UUID	PK, auto-generated	Unique engagement identifier
organization_id	UUID	FK, NOT NULL	Tenant organization
client_id	UUID	FK, NOT NULL	Associated client
engagement_number	VARCHAR(50)	UNIQUE	Auto-generated reference
name	VARCHAR(255)	NOT NULL	Engagement/project name
description	TEXT		Detailed description
engagement_type	ENUM	NOT NULL	outsourcing/consulting/recruitment/training/othe
status	ENUM	NOT NULL	draft/active/on_hold/completed/cancelled
priority	ENUM	DEFAULT ‘medium’	low/medium/high/critical
start_date	DATE		Planned start date
end_date	DATE		Planned end date
actual_start_date	DATE		Actual start date
actual_end_date	DATE		Actual end date
contract_value	DECIMAL(15,2)		Total contract value
billing_type	ENUM		fixed/hourly/monthly/milestone
billing_rate	DECIMAL(15,2)		Rate per billing type
currency	VARCHAR(3)	DEFAULT ‘NGN’	Currency code
primary_contact_id	UUID	FK	Primary client contact
account_manager_id	UUID	FK	TeamACE account manager
contract_document_url	VARCHAR(500)		Contract document path
custom_fields	JSONB		Custom engagement fields
created_by	UUID	FK	Creator user ID
created_at	TIMESTAMP	DEFAULT NOW()	Creation timestamp
updated_at	TIMESTAMP		Last update timestamp
deleted_at	TIMESTAMP		Soft delete timestamp

Field	Type	Constraints	Description

3.2.4 Documents Entity

Field	Type	Constraints	Description
id	UUID	PK, auto-generated	Unique document identifier
organization_id	UUID	FK, NOT NULL	Tenant organization
entity_type	VARCHAR(50)	NOT NULL	client/contact/engagement/etc
entity_id	UUID	NOT NULL	Associated entity ID
document_type	ENUM	NOT NULL	contract/proposal/report/invoice/other
file_name	VARCHAR(255)	NOT NULL	Original filename
file_path	VARCHAR(500)	NOT NULL	Storage path
file_size	INTEGER		File size in bytes
mime_type	VARCHAR(100)		MIME type
version	INTEGER	DEFAULT 1	Document version
is_current	BOOLEAN	DEFAULT TRUE	Current version flag
parent_document_id	UUID	FK	Previous version reference
description	TEXT		Document description
tags	VARCHAR[]		Searchable tags
uploaded_by	UUID	FK	Uploader user ID
created_at	TIMESTAMP	DEFAULT NOW()	Upload timestamp
deleted_at	TIMESTAMP		Soft delete timestamp

3.2.5 Activity Logs Entity

Field	Type	Constraints	Description
id	UUID	PK, auto-generated	Unique activity identifier
organization_id	UUID	FK, NOT NULL	Tenant organization
entity_type	VARCHAR(50)	NOT NULL	client/contact/engagement/etc
entity_id	UUID	NOT NULL	Associated entity ID
activity_type	ENUM	NOT NULL	call/email/meeting/note/status_change/etc
subject	VARCHAR(255)		Activity subject/title
description	TEXT		Activity details
outcome	VARCHAR(255)		Activity outcome
activity_date	TIMESTAMP	NOT NULL	When activity occurred
duration_minutes	INTEGER		Duration in minutes
participants	JSONB		List of participants
attachments	JSONB		Related document IDs
follow_up_date	TIMESTAMP		Follow-up reminder date
follow_up_notes	TEXT		Follow-up notes
created_by	UUID	FK, NOT NULL	User who logged activity
created_at	TIMESTAMP	DEFAULT NOW()	Creation timestamp

3.3 Functional Requirements

3.3.1 Client Management

ID	Requirement	Priority
CRM-C001	System shall create new client company profiles with all required fields	Critical
CRM-C002	System shall validate Nigerian TIN format (10-12 digits)	High
CRM-C003	System shall validate CAC registration number format	High
CRM-C004	System shall prevent duplicate clients based on company name + registration number	Critical
CRM-C005	System shall support client status transitions: prospect → active → inactive/former	Critical
CRM-C006	System shall automatically assign engagement numbers in format: ENG-YYYY-NNNN	High
CRM-C007	System shall support bulk client import via CSV template	Medium
CRM-C008	System shall export client list to CSV/Excel	Medium
CRM-C009	System shall display client org chart showing contacts and relationships	Low
CRM-C010	System shall track all client record modifications in audit log	Critical
CRM-C011	System shall allow soft deletion of clients (not permanent delete)	Critical
CRM-C012	System shall filter clients by type, tier, industry, account manager	High
CRM-C013	System shall search clients by name, registration number, TIN	Critical
CRM-C014	System shall display client dashboard with key metrics	High
CRM-C015	System shall show all related entities (contacts, engagements, invoices) on client profile	Critical

3.3.2 Contact Management

ID	Requirement	Priority
CRM-CT001	System shall create contacts linked to a parent client	Critical
CRM-CT002	System shall validate email format for contacts	High
CRM-CT003	System shall validate Nigerian phone number format (+234…)	Medium
CRM-CT004	System shall designate one contact as primary per client	High
CRM-CT005	System shall flag contacts as decision makers	High
CRM-CT006	System shall flag contacts as billing contacts	High
CRM-CT007	System shall support multiple contacts per client (no limit)	Critical
CRM-CT008	System shall display contact birthday reminders	Low
CRM-CT009	System shall search contacts across all clients	High
CRM-CT010	System shall export contact list to CSV/Excel	Medium

3.3.3 Engagement Management

ID	Requirement	Priority
CRM-E001	System shall create engagements linked to a client	Critical
CRM-E002	System shall auto-generate unique engagement numbers	Critical
CRM-E003	System shall support engagement types: outsourcing, consulting, recruitment, training, other	Critical
CRM-E004	System shall track engagement status lifecycle	Critical
CRM-E005	System shall calculate engagement duration (planned vs actual)	High
CRM-E006	System shall support multiple billing types per engagement	High
CRM-E007	System shall link engagement to primary client contact	High
CRM-E008	System shall assign account manager to each engagement	Critical
CRM-E009	System shall attach contract documents to engagements	High
CRM-E010	System shall trigger alerts for expiring engagements (30, 14, 7 days)	High
CRM-E011	System shall display engagement timeline with activities	High
CRM-E012	System shall show financial summary per engagement	High
CRM-E013	System shall support engagement cloning for renewals	Medium
CRM-E014	System shall filter engagements by status, type, client, date range	High

3.3.4 Document Management

ID	Requirement	Priority
CRM-D001	System shall upload documents up to 25MB per file	Critical
CRM-D002	System shall support file types: PDF, DOC/DOCX, XLS/XLSX, PNG, JPG	Critical
CRM-D003	System shall maintain document version history	High
CRM-D004	System shall mark latest document version as current	High
CRM-D005	System shall categorize documents by type	High
CRM-D006	System shall tag documents for searchability	Medium
CRM-D007	System shall search documents by name, type, tags	High
CRM-D008	System shall preview PDF documents in browser	Medium
CRM-D009	System shall download documents with original filename	Critical
CRM-D010	System shall track document download/view history	Medium
CRM-D011	System shall enforce document access based on user role	Critical

3.3.5 Activity Logging

ID	Requirement	Priority
CRM-A001	System shall log activities against any entity (client, contact, engagement)	Critical
CRM-A002	System shall support activity types: call, email, meeting, note, status_change	Critical
CRM-A003	System shall record activity date/time and duration	High
CRM-A004	System shall track activity participants	High
CRM-A005	System shall attach documents to activities	Medium
CRM-A006	System shall set follow-up reminders on activities	High
CRM-A007	System shall display activity timeline per entity	Critical
CRM-A008	System shall filter activities by type, date range, user	High
CRM-A009	System shall auto-log status changes as activities	High
CRM-A010	System shall display recent activities on dashboard	High

3.4 User Interface Requirements

3.4.1 Client Screens

Screen	Description
Client List	Paginated table with filters, search, quick actions
Client Create/Edit	Multi-section form with validation
Client Detail	Tabbed view: Overview, Contacts, Engagements, Documents, Activities, Invoices
Client Dashboard	Widget-based summary with KPIs

3.4.2 Contact Screens

Screen	Description
Contact List	Global contact directory with client grouping
Contact Create/Edit	Modal form linked to client
Contact Detail	Profile card with activity history

3.4.3 Engagement Screens

Screen	Description
Engagement List	Table with status filters and date range
Engagement Create/Edit	Wizard-style multi-step form
Engagement Detail	Tabbed view: Overview, Staff, Financials, Documents, Activities
Engagement Kanban	Board view by status for visual management

3.5 API Specifications

3.5.1 Client Endpoints

Method	Endpoint	Description
GET	/api/clients	List clients with pagination and filters
GET	/api/clients/:id	Get client by ID with relations
POST	/api/clients	Create new client
PUT	/api/clients/:id	Update client
DELETE	/api/clients/:id	Soft delete client
GET	/api/clients/:id/contacts	Get client contacts
GET	/api/clients/:id/engagements	Get client engagements
GET	/api/clients/:id/documents	Get client documents
GET	/api/clients/:id/activities	Get client activities
GET	/api/clients/:id/invoices	Get client invoices
POST	/api/clients/import	Bulk import clients from CSV
GET	/api/clients/export	Export clients to CSV/Excel

3.5.2 Contact Endpoints

Method	Endpoint	Description
GET	/api/contacts	List all contacts with filters
GET	/api/contacts/:id	Get contact by ID
POST	/api/contacts	Create contact
PUT	/api/contacts/:id	Update contact
DELETE	/api/contacts/:id	Soft delete contact
PUT	/api/contacts/:id/set-primary	Set as primary contact

3.5.3 Engagement Endpoints

Method	Endpoint	Description
GET	/api/engagements	List engagements with filters
GET	/api/engagements/:id	Get engagement by ID
POST	/api/engagements	Create engagement
PUT	/api/engagements/:id	Update engagement
DELETE	/api/engagements/:id	Soft delete engagement
PUT	/api/engagements/:id/status	Update engagement status
POST	/api/engagements/:id/clone	Clone engagement
GET	/api/engagements/:id/staff	Get assigned staff
GET	/api/engagements/:id/invoices	Get engagement invoices

3.5.4 Document Endpoints

Method	Endpoint	Description
GET	/api/documents	List documents with filters
GET	/api/documents/:id	Get document metadata
GET	/api/documents/:id/download	Download document file
POST	/api/documents	Upload document
PUT	/api/documents/:id	Update document metadata

Method	Endpoint	Description
DELETE	/api/documents/:id	Soft delete document
POST	/api/documents/:id/version	Upload new version

3.5.5 Activity Endpoints

Method	Endpoint	Description
GET	/api/activities	List activities with filters
GET	/api/activities/:id	Get activity by ID
POST	/api/activities	Log new activity
PUT	/api/activities/:id	Update activity
DELETE	/api/activities/:id	Delete activity
GET	/api/activities/recent	Get recent activities for dashboard

3.6 Business Rules

ID	Rule	Enforcement
BR-C001	Client registration number must be unique within organization	Database constraint + API validation
BR-C002	Client cannot be deleted if active engagements exist	API validation
BR-C003	Primary contact must exist before engagement can be created	API validation
BR-C004	Engagement contract value must be positive or zero	Database check constraint
BR-C005	Engagement end date must be after start date	API validation
BR-C006	Only one document version can be marked as current	Application logic
BR-C007	Activity date cannot be in the future (except follow-ups)	API validation
BR-C008	Account manager must be a valid system user	Foreign key constraint

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4. Module 1.2: Business Development Essentials

4.1 Module Overview

The Business Development Essentials module manages the sales pipeline from initial lead capture through to closed deals. It enables tracking of potential clients, sales opportunities, proposals, and revenue forecasting.

Priority: HIGH **Estimated Effort:** 3-4 sprints (6-8 weeks) **Reuse Source:** Workforce recruitment pipeline (50%)

4.2 Data Entities

4.2.1 Leads Entity

Field	Type	Constraints	Description
id	UUID	PK, auto-generated	Unique lead identifier
organization_id	UUID	FK, NOT NULL	Tenant organization
lead_number	VARCHAR(50)	UNIQUE	Auto-generated reference (LD-YYYY-NNNN)
company_name	VARCHAR(255)	NOT NULL	Prospect company name
contact_name	VARCHAR(255)		Primary contact name
contact_email	VARCHAR(255)		Contact email
contact_phone	VARCHAR(50)		Contact phone
contact_title	VARCHAR(100)		Contact job title
industry	VARCHAR(100)		Industry sector
company_size	ENUM		micro/small/medium/large/enterprise
source	ENUM	NOT NULL	referral/website/linkedin/cold_call/event/other
source_details	VARCHAR(255)		Source-specific details
status	ENUM	NOT NULL	new/contacted/qualified/unqualified/converted
score	INTEGER		Lead score (0-100)
estimated_value	DECIMAL(15,2)		Estimated deal value
service_interest	VARCHAR[]		Services of interest
notes	TEXT		Lead notes
assigned_to	UUID	FK	Assigned BD representative
converted_to_client_id	UUID	FK	Converted client reference
converted_at	TIMESTAMP		Conversion timestamp
next_follow_up	TIMESTAMP		Next follow-up date
last_contacted	TIMESTAMP		Last contact date
created_by	UUID	FK	Creator user ID
created_at	TIMESTAMP	DEFAULT NOW()	Creation timestamp
updated_at	TIMESTAMP		Last update timestamp

4.2.2 Pipeline Stages Entity

Field	Type	Constraints	Description
id	UUID	PK, auto-generated	Unique stage identifier
organization_id	UUID	FK, NOT NULL	Tenant organization
name	VARCHAR(100)	NOT NULL	Stage name
description	TEXT		Stage description
order_index	INTEGER	NOT NULL	Display order
probability	INTEGER		Win probability (0-100%)
color	VARCHAR(7)		Hex color code for UI
is_default	BOOLEAN	DEFAULT FALSE	Default stage for new opportunities
is_won	BOOLEAN	DEFAULT FALSE	Marks closed-won stage
is_lost	BOOLEAN	DEFAULT FALSE	Marks closed-lost stage
created_at	TIMESTAMP	DEFAULT NOW()	Creation timestamp

Default Pipeline Stages: 1. Qualification (10%) 2. Needs Analysis (25%) 3. Proposal Sent (50%) 4. Negotiation (75%) 5. Closed Won (100%) 6. Closed Lost (0%)

4.2.3 Opportunities Entity

Field	Type	Constraints	Description
id	UUID	PK, auto-generated	Unique opportunity identifier
organization_id	UUID	FK, NOT NULL	Tenant organization
opportunity_number	VARCHAR(50)	UNIQUE	Auto-generated (OPP-YYYY-NNNN)
name	VARCHAR(255)	NOT NULL	Opportunity name
description	TEXT		Detailed description
client_id	UUID	FK	Existing client (if any)
lead_id	UUID	FK	Source lead (if any)
stage_id	UUID	FK, NOT NULL	Current pipeline stage
deal_value	DECIMAL(15,2)	NOT NULL	Expected deal value
currency	VARCHAR(3)	DEFAULT 'NGN'	Currency code
probability	INTEGER		Win probability override
weighted_value	DECIMAL(15,2)		Calculated: value × probability
expected_close_date	DATE		Expected closing date
actual_close_date	DATE		Actual closing date
service_type	VARCHAR(100)		Type of service
contract_duration_months	INTEGER		Expected contract length
competitors	VARCHAR[]		Known competitors
decision_makers	JSONB		Key decision makers
next_step	TEXT		Next action required
loss_reason	VARCHAR(255)		Reason if lost
won_reason	VARCHAR(255)		Key winning factor
assigned_to	UUID	FK	Assigned BD representative
created_by	UUID	FK	Creator user ID
created_at	TIMESTAMP	DEFAULT NOW()	Creation timestamp
updated_at	TIMESTAMP		Last update timestamp

4.2.4 Proposals Entity

Field	Type	Constraints	Description
id	UUID	PK, auto-generated	Unique proposal identifier
organization_id	UUID	FK, NOT NULL	Tenant organization
proposal_number	VARCHAR(50)	UNIQUE	Auto-generated (PRP-YYYY-NNNN)
opportunity_id	UUID	FK	Related opportunity
client_id	UUID	FK	Target client
title	VARCHAR(255)	NOT NULL	Proposal title
executive_summary	TEXT		Executive summary
scope_of_work	TEXT		Detailed scope
deliverables	JSONB		List of deliverables
pricing	JSONB		Pricing breakdown
total_value	DECIMAL(15,2)		Total proposal value
currency	VARCHAR(3)	DEFAULT 'NGN'	Currency code
validity_days	INTEGER	DEFAULT 30	Validity period
valid_until	DATE		Expiration date
status	ENUM	NOT NULL	draft/sent/viewed/accepted/rejected/expired
sent_at	TIMESTAMP		Date/time sent
sent_to	VARCHAR[]		Recipient emails
viewed_at	TIMESTAMP		First view timestamp

Field	Type	Constraints	Description
response_date	TIMESTAMP		Client response date
response_notes	TEXT		Client feedback
template_id	UUID	FK	Source template
document_url	VARCHAR(500)		Generated PDF path
created_by	UUID	FK	Creator user ID
created_at	TIMESTAMP	DEFAULT NOW()	Creation timestamp
updated_at	TIMESTAMP		Last update timestamp

4.2.5 Communication Logs Entity

Field	Type	Constraints	Description
id	UUID	PK, auto-generated	Unique log identifier
organization_id	UUID	FK, NOT NULL	Tenant organization
entity_type	VARCHAR(50)	NOT NULL	lead/opportunity/client
entity_id	UUID	NOT NULL	Related entity ID
communication_type	ENUM	NOT NULL	email/call/meeting/sms/whatsapp
direction	ENUM	NOT NULL	inbound/outbound
subject	VARCHAR(255)		Subject/topic
content	TEXT		Communication content
participants	JSONB		Participants list
scheduled_at	TIMESTAMP		Scheduled time (for meetings)
duration_minutes	INTEGER		Duration in minutes
outcome	TEXT		Communication outcome
follow_up_required	BOOLEAN	DEFAULT FALSE	Follow-up needed
follow_up_date	TIMESTAMP		Follow-up date
attachments	JSONB		Attachment references
logged_by	UUID	FK	Logger user ID
created_at	TIMESTAMP	DEFAULT NOW()	Creation timestamp

4.3 Functional Requirements

4.3.1 Lead Management

ID	Requirement	Priority
BD-L001	System shall capture leads with company and contact information	Critical
BD-L002	System shall auto-generate unique lead numbers	Critical
BD-L003	System shall track lead source (referral, website, LinkedIn, cold call, event)	Critical
BD-L004	System shall assign leads to BD representatives	Critical
BD-L005	System shall score leads based on configurable criteria	High
BD-L006	System shall track lead status progression	Critical
BD-L007	System shall convert qualified leads to clients	Critical
BD-L008	System shall prevent duplicate leads (same company name + email)	High
BD-L009	System shall capture web form leads via API	High
BD-L010	System shall import leads from CSV	Medium

ID	Requirement	Priority
BD-L011	System shall display lead aging (days since creation)	High
BD-L012	System shall send follow-up reminders	High
BD-L013	System shall show lead conversion rate analytics	High
BD-L014	System shall filter leads by source, status, assigned user, date	High
BD-L015	System shall export leads to CSV	Medium

4.3.2 Pipeline Management

ID	Requirement	Priority
BD-P001	System shall display visual Kanban board of pipeline stages	Critical
BD-P002	System shall allow drag-drop movement between stages	Critical
BD-P003	System shall auto-calculate weighted pipeline value	Critical
BD-P004	System shall support custom pipeline stages per organization	High
BD-P005	System shall track stage duration (time in stage)	High
BD-P006	System shall log all stage transitions	Critical
BD-P007	System shall display pipeline by BD representative	High
BD-P008	System shall show pipeline velocity metrics	Medium
BD-P009	System shall alert on stale opportunities (configurable days)	High
BD-P010	System shall support multiple pipelines (optional)	Low

4.3.3 Opportunity Management

ID	Requirement	Priority
BD-O001	System shall create opportunities linked to leads or clients	Critical
BD-O002	System shall auto-generate unique opportunity numbers	Critical
BD-O003	System shall calculate weighted value (deal value × probability)	Critical
BD-O004	System shall track expected and actual close dates	Critical
BD-O005	System shall record competitors on opportunities	Medium
BD-O006	System shall track decision makers	High
BD-O007	System shall capture win/loss reasons	Critical
BD-O008	System shall link opportunities to proposals	High
BD-O009	System shall show opportunity history timeline	High
BD-O010	System shall duplicate opportunities	Low

ID	Requirement	Priority
BD-O011	System shall filter opportunities by stage, value, date, owner	High

4.3.4 Proposal Management

ID	Requirement	Priority
BD-PR001	System shall create proposals linked to opportunities	Critical
BD-PR002	System shall auto-generate unique proposal numbers	Critical
BD-PR003	System shall support proposal templates	High
BD-PR004	System shall include scope of work and deliverables	Critical
BD-PR005	System shall include detailed pricing breakdown	Critical
BD-PR006	System shall calculate total proposal value	Critical
BD-PR007	System shall set validity period and expiration date	High
BD-PR008	System shall generate PDF proposal documents	Critical
BD-PR009	System shall email proposals directly from system	High
BD-PR010	System shall track proposal views (optional tracking link)	Medium
BD-PR011	System shall track proposal status transitions	Critical
BD-PR012	System shall support proposal versioning	Medium
BD-PR013	System shall auto-expire proposals past validity date	High
BD-PR014	System shall create engagement from accepted proposal	High

4.3.5 Revenue Forecasting

ID	Requirement	Priority
BD-F001	System shall display forecast by pipeline stage	Critical
BD-F002	System shall show weighted vs unweighted forecast	Critical
BD-F003	System shall forecast by month/quarter	High
BD-F004	System shall compare forecast vs actual (historical)	High
BD-F005	System shall forecast by BD representative	High
BD-F006	System shall forecast by service type	Medium
BD-F007	System shall export forecast reports	High

4.3.6 Bulk Communications

ID	Requirement	Priority
BD-BC001	System shall send bulk emails to selected leads/contacts	High

ID	Requirement	Priority
BD-BC002	System shall support email templates with merge fields	High
BD-BC003	System shall track email open rates (optional)	Low
BD-BC004	System shall schedule bulk communications	Medium
BD-BC005	System shall send birthday greetings (automated)	Low
BD-BC006	System shall maintain unsubscribe list	High
BD-BC007	System shall log all communications	Critical

4.4 User Interface Requirements

4.4.1 Lead Screens

Screen	Description
Lead List	Paginated table with status filters, search
Lead Create/Edit	Form with validation, duplicate check
Lead Detail	Profile with activities, conversion action
Lead Import	CSV upload wizard

4.4.2 Pipeline Screens

Screen	Description
Pipeline Kanban	Drag-drop board with opportunity cards
Pipeline Table	Alternative list view with all details
Pipeline Settings	Configure stages, probabilities, colors

4.4.3 Opportunity Screens

Screen	Description
Opportunity List	Filterable table view
Opportunity Create/Edit	Multi-section form
Opportunity Detail	Tabbed: Overview, Activities, Proposals, History

4.4.4 Proposal Screens

Screen	Description
Proposal List	Status-filtered table
Proposal Builder	Rich editor with sections
Proposal Preview	PDF preview before sending
Proposal Templates	Template management

4.4.5 Dashboard Screens

Screen	Description
BD Dashboard	Pipeline value, conversion rates, activities
Forecast Report	Monthly/quarterly projections

4.5 API Specifications

4.5.1 Lead Endpoints

Method	Endpoint	Description
GET	/api/leads	List leads with filters
GET	/api/leads/:id	Get lead by ID
POST	/api/leads	Create lead
PUT	/api/leads/:id	Update lead
DELETE	/api/leads/:id	Delete lead
POST	/api/leads/:id/convert	Convert lead to client
POST	/api/leads/import	Import leads from CSV
GET	/api/leads/export	Export leads to CSV
POST	/api/leads/webhook	Web form capture endpoint

4.5.2 Pipeline Endpoints

Method	Endpoint	Description
GET	/api/pipeline/stages	List pipeline stages
POST	/api/pipeline/stages	Create stage
PUT	/api/pipeline/stages/:id	Update stage
PUT	/api/pipeline/stages/reorder	Reorder stages
DELETE	/api/pipeline/stages/:id	Delete stage
GET	/api/pipeline/board	Get Kanban board data

4.5.3 Opportunity Endpoints

Method	Endpoint	Description
GET	/api/opportunities	List opportunities
GET	/api/opportunities/:id	Get opportunity by ID
POST	/api/opportunities	Create opportunity
PUT	/api/opportunities/:id	Update opportunity
PUT	/api/opportunities/:id/stage	Move to stage
PUT	/api/opportunities/:id/close	Close won/lost
DELETE	/api/opportunities/:id	Delete opportunity
GET	/api/opportunities/:id/proposals	Get related proposals

4.5.4 Proposal Endpoints

Method	Endpoint	Description
GET	/api/proposals	List proposals
GET	/api/proposals/:id	Get proposal by ID
POST	/api/proposals	Create proposal

Method	Endpoint	Description
PUT	/api/proposals/:id	Update proposal
DELETE	/api/proposals/:id	Delete proposal
POST	/api/proposals/:id/send	Send proposal
GET	/api/proposals/:id/pdf	Generate/download PDF
PUT	/api/proposals/:id/accept	Mark as accepted
PUT	/api/proposals/:id/reject	Mark as rejected
GET	/api/proposals/templates	List templates
POST	/api/proposals/templates	Create template

4.5.5 Forecast Endpoints

Method	Endpoint	Description
GET	/api/forecast	Get forecast summary
GET	/api/forecast/by-stage	Forecast by pipeline stage
GET	/api/forecast/by-month	Forecast by month
GET	/api/forecast/by-user	Forecast by BD rep

4.6 Business Rules

ID	Rule	Enforcement
BR-BD001	Lead cannot be converted if status is 'unqualified'	API validation
BR-BD002	Opportunity must have deal value > 0	Database check constraint
BR-BD003	Closed opportunities cannot be edited (except notes)	API validation
BR-BD004	Proposal cannot be sent if status is not 'draft'	API validation
BR-BD005	Win probability must be 0-100	Database check constraint
BR-BD006	Lost opportunity must have loss_reason	API validation
BR-BD007	Proposal validity cannot exceed 90 days	API validation
BR-BD008	Cannot delete pipeline stage with opportunities	API validation

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5. Module 1.3: HR Outsourcing Essentials

5.1 Module Overview

The HR Outsourcing Essentials module extends the Workforce HRIS capabilities to manage staff deployed to client organizations. It tracks which employees are assigned to which clients, their deployment status, and services rendered.

Priority: HIGH **Estimated Effort:** 2-3 sprints (4-6 weeks) **Reuse Source:** Workforce HRIS (80%)

5.2 Data Entities

5.2.1 Client Staff Assignments Entity

Field	Type	Constraints	Description
id	UUID	PK, auto-generated	Unique assignment identifier
organization_id	UUID	FK, NOT NULL	Tenant organization
employee_id	UUID	FK, NOT NULL	Assigned employee
client_id	UUID	FK, NOT NULL	Client organization
engagement_id	UUID	FK	Related engagement
assignment_number	VARCHAR(50)	UNIQUE	Auto-generated reference
position_title	VARCHAR(100)	NOT NULL	Position at client
department	VARCHAR(100)		Client department
location	VARCHAR(255)		Work location
supervisor_name	VARCHAR(255)		Client-side supervisor
supervisor_email	VARCHAR(255)		Supervisor email
supervisor_phone	VARCHAR(50)		Supervisor phone
status	ENUM	NOT NULL	active/on_hold/completed/terminated
assignment_type	ENUM	NOT NULL	full_time/part_time/contract/temporary
start_date	DATE	NOT NULL	Assignment start date
expected_end_date	DATE		Expected end date
actual_end_date	DATE		Actual end date
billing_rate	DECIMAL(15,2)		Billing rate to client
billing_frequency	ENUM		hourly/daily/monthly
cost_rate	DECIMAL(15,2)		Cost to TeamACE
margin_percentage	DECIMAL(5,2)		Profit margin
probation_end_date	DATE		Probation period end
confirmation_date	DATE		Confirmation date
work_schedule	JSONB		Work hours/days
special_terms	TEXT		Special assignment terms
termination_reason	VARCHAR(255)		Reason if terminated
termination_notes	TEXT		Termination details
created_by	UUID	FK	Creator user ID
created_at	TIMESTAMP	DEFAULT NOW()	Creation timestamp
updated_at	TIMESTAMP		Last update timestamp

5.2.2 Deployments Entity

Field	Type	Constraints	Description
id	UUID	PK, auto-generated	Unique deployment identifier
organization_id	UUID	FK, NOT NULL	Tenant organization
assignment_id	UUID	FK, NOT NULL	Parent assignment
deployment_type	ENUM	NOT NULL	initial/transfer/extension/return
location	VARCHAR(255)	NOT NULL	Deployment location
location_type	ENUM		office/site/remote/hybrid
address	TEXT		Full address
city	VARCHAR(100)		City
state	VARCHAR(100)		State
start_date	DATE	NOT NULL	Deployment start date
end_date	DATE		Deployment end date
reason	TEXT		Reason for deployment/transfer
approved_by	UUID	FK	Approver user ID

Field	Type	Constraints	Description
approved_at	TIMESTAMP		Approval timestamp
notes	TEXT		Additional notes
created_at	TIMESTAMP	DEFAULT NOW()	Creation timestamp

5.2.3 Contract Documents Entity

Field	Type	Constraints	Description
id	UUID	PK, auto-generated	Unique document identifier
organization_id	UUID	FK, NOT NULL	Tenant organization
assignment_id	UUID	FK, NOT NULL	Related assignment
document_type	ENUM	NOT NULL	employment_contract/nda/client_agreement/exte
document_name	VARCHAR(255)	NOT NULL	Document name
file_path	VARCHAR(500)	NOT NULL	Storage path
version	INTEGER	DEFAULT 1	Document version
effective_date	DATE		Effective from date
expiry_date	DATE		Expiration date
signed_by_employee	BOOLEAN	DEFAULT FALSE	Employee signed
signed_by_client	BOOLEAN	DEFAULT FALSE	Client signed
signed_by_teamace	BOOLEAN	DEFAULT FALSE	TeamACE signed
signature_date	DATE		Signature date
is_active	BOOLEAN	DEFAULT TRUE	Active document flag
notes	TEXT		Document notes
uploaded_by	UUID	FK	Uploader user ID
created_at	TIMESTAMP	DEFAULT NOW()	Upload timestamp

5.2.4 Service Logs Entity

Field	Type	Constraints	Description
id	UUID	PK, auto-generated	Unique log identifier
organization_id	UUID	FK, NOT NULL	Tenant organization
assignment_id	UUID	FK, NOT NULL	Related assignment
client_id	UUID	FK, NOT NULL	Client organization
service_date	DATE	NOT NULL	Date of service
service_type	ENUM	NOT NULL	regular_hours/overtime/on_call/training/meeting
hours_worked	DECIMAL(5,2)		Hours worked
description	TEXT		Service description
deliverables	TEXT		Deliverables/output
billable	BOOLEAN	DEFAULT TRUE	Billable flag
billing_amount	DECIMAL(15,2)		Calculated billing amount
approved_by_client	BOOLEAN	DEFAULT FALSE	Client approval
client_approval_date	TIMESTAMP		Client approval date
client_approver_name	VARCHAR(255)		Client approver name
notes	TEXT		Additional notes
logged_by	UUID	FK	Logger user ID
created_at	TIMESTAMP	DEFAULT NOW()	Creation timestamp
updated_at	TIMESTAMP		Last update timestamp

5.3 Functional Requirements

5.3.1 Staff Assignment Management

ID	Requirement	Priority
HR-A001	System shall assign employees to client organizations	Critical
HR-A002	System shall auto-generate unique assignment numbers	Critical
HR-A003	System shall link assignments to client engagements	Critical
HR-A004	System shall track assignment status lifecycle	Critical
HR-A005	System shall record position and department at client	High
HR-A006	System shall capture client-side supervisor details	High
HR-A007	System shall support assignment types (full-time, part-time, contract, temporary)	High
HR-A008	System shall track billing and cost rates per assignment	Critical
HR-A009	System shall calculate margin percentage automatically	High
HR-A010	System shall record probation and confirmation dates	High
HR-A011	System shall capture work schedules	Medium
HR-A012	System shall track termination with reasons	Critical
HR-A013	System shall alert on expiring assignments (30, 14, 7 days)	High
HR-A014	System shall prevent duplicate active assignments (same employee + client)	High
HR-A015	System shall show assignment history per employee	High

5.3.2 Deployment Tracking

ID	Requirement	Priority
HR-D001	System shall track deployment locations	Critical
HR-D002	System shall support deployment types (initial, transfer, extension, return)	High
HR-D003	System shall record deployment dates	Critical
HR-D004	System shall capture approval workflow for transfers	High
HR-D005	System shall maintain deployment history	High
HR-D006	System shall report on staff by location	High
HR-D007	System shall support multiple deployments per assignment	High

5.3.3 Contract Document Management

ID	Requirement	Priority
HR-CD001	System shall upload contract documents per assignment	Critical
HR-CD002	System shall categorize documents by type	High
HR-CD003	System shall track document versions	High

ID	Requirement	Priority
HR-CD004	System shall record effective and expiry dates	High
HR-CD005	System shall track signature status (employee, client, TeamACE)	High
HR-CD006	System shall alert on expiring contracts	Critical
HR-CD007	System shall support document templates	Medium

5.3.4 Service Logging

ID	Requirement	Priority
HR-SL001	System shall log services rendered per assignment	Critical
HR-SL002	System shall track hours worked	High
HR-SL003	System shall categorize service types	High
HR-SL004	System shall calculate billing amounts	Critical
HR-SL005	System shall flag billable vs non-billable services	High
HR-SL006	System shall support client approval workflow	High
HR-SL007	System shall generate service reports per client	Critical
HR-SL008	System shall integrate with timesheet data (from Workforce)	Medium
HR-SL009	System shall support bulk service log import	Medium

5.3.5 Employee Lifecycle at Client

ID	Requirement	Priority
HR-EL001	System shall track hire date at client	Critical
HR-EL002	System shall track probation status	High
HR-EL003	System shall record confirmation	High
HR-EL004	System shall support redeployment to different client	High
HR-EL005	System shall track exit from client	Critical
HR-EL006	System shall maintain employee timeline across clients	High
HR-EL007	System shall support performance notes per assignment	Medium

5.3.6 Client-Based Payroll Grouping

ID	Requirement	Priority
HR-PG001	System shall group employees by client for payroll	Critical
HR-PG002	System shall support separate payroll runs per client	High
HR-PG003	System shall link payroll to billing for reconciliation	High
HR-PG004	System shall track salary funding by client	Medium
HR-PG005	System shall report payroll cost vs billing per client	High

5.4 User Interface Requirements

5.4.1 Assignment Screens

Screen	Description
Assignment List	Filterable by client, status, employee
Assignment Create/Edit	Form with employee and client selection
Assignment Detail	Tabbed: Overview, Deployments, Documents, Service Logs
Assignment Timeline	Visual lifecycle view

5.4.2 Deployment Screens

Screen	Description
Deployment History	Timeline view per assignment
Deployment Create	Form with location and dates
Deployment Map	Geographic view of staff locations

5.4.3 Service Log Screens

Screen	Description
Service Log List	Filterable table
Service Log Entry	Quick entry form
Service Log Approval	Client approval workflow
Service Report	Summary by client/period

5.5 API Specifications

5.5.1 Assignment Endpoints

Method	Endpoint	Description
GET	/api/assignments	List assignments with filters
GET	/api/assignments/:id	Get assignment by ID
POST	/api/assignments	Create assignment
PUT	/api/assignments/:id	Update assignment
PUT	/api/assignments/:id/status	Update assignment status
DELETE	/api/assignments/:id	Soft delete assignment
GET	/api/assignments/:id/deployments	Get deployment history
GET	/api/assignments/:id/documents	Get contract documents
GET	/api/assignments/:id/service-logs	Get service logs
GET	/api/employees/:id/assignments	Get assignments by employee
GET	/api/clients/:id/assignments	Get assignments by client

5.5.2 Deployment Endpoints

Method	Endpoint	Description
GET	/api/deployments	List deployments
GET	/api/deployments/:id	Get deployment by ID

Method	Endpoint	Description
POST	/api/deployments	Create deployment
PUT	/api/deployments/:id	Update deployment
DELETE	/api/deployments/:id	Delete deployment

5.5.3 Contract Document Endpoints

Method	Endpoint	Description
GET	/api/assignment-documents	List documents
GET	/api/assignment-documents/:id	Get document
POST	/api/assignment-documents	Upload document
PUT	/api/assignment-documents/:id	Update document
DELETE	/api/assignment-documents/:id	Delete document
GET	/api/assignment-documents/:id/download	Download document

5.5.4 Service Log Endpoints

Method	Endpoint	Description
GET	/api/service-logs	List service logs
GET	/api/service-logs/:id	Get service log
POST	/api/service-logs	Create service log
PUT	/api/service-logs/:id	Update service log
DELETE	/api/service-logs/:id	Delete service log
PUT	/api/service-logs/:id/approve	Client approve
POST	/api/service-logs/bulk	Bulk create logs
GET	/api/service-logs/report	Generate report

5.6 Business Rules

ID	Rule	Enforcement
BR-HR001	Employee cannot have multiple active assignments to same client	API validation
BR-HR002	Assignment end date must be after start date	API validation
BR-HR003	Billing rate must be greater than or equal to cost rate	API validation
BR-HR004	Service log hours must be positive and ≤ 24 per day	API validation
BR-HR005	Terminated assignment cannot be edited	API validation
BR-HR006	Deployment must be linked to active assignment	API validation

ID	Rule	Enforcement
BR-HR007	Contract document expiry date must be after effective date	API validation

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6. Module 1.4: Finance Light (Invoicing + Receivables)

6.1 Module Overview

The Finance Light module provides essential invoicing and receivables management capabilities. It enables generation of client invoices, tracking of payments, and basic financial reporting without full accounting system complexity.

Priority: HIGH **Estimated Effort:** 2-3 sprints (4-6 weeks) **Reuse Source:** InvoiceFlow (70%)

6.2 Data Entities

6.2.1 Invoices Entity

Field	Type	Constraints	Description
id	UUID	PK, auto-generated	Unique invoice identifier
organization_id	UUID	FK, NOT NULL	Tenant organization
invoice_number	VARCHAR(50)	UNIQUE	Auto-generated (INV-YYYY-NNNN)
client_id	UUID	FK, NOT NULL	Client organization
engagement_id	UUID	FK	Related engagement
billing_contact_id	UUID	FK	Billing contact
invoice_type	ENUM	NOT NULL	standard/proforma/credit_note
status	ENUM	NOT NULL	draft/sent/viewed/paid/partial/overdue/cancelled
issue_date	DATE	NOT NULL	Invoice date
due_date	DATE	NOT NULL	Payment due date
payment_terms	INTEGER	DEFAULT 30	Payment terms (days)
currency	VARCHAR(3)	DEFAULT 'NGN'	Currency code
subtotal	DECIMAL(15,2)	NOT NULL	Sum of line items
discount_type	ENUM		percentage/fixed
discount_value	DECIMAL(15,2)		Discount amount
discount_amount	DECIMAL(15,2)		Calculated discount
tax_rate	DECIMAL(5,2)		VAT/tax rate
tax_amount	DECIMAL(15,2)		Calculated tax
wht_rate	DECIMAL(5,2)		Withholding tax rate
wht_amount	DECIMAL(15,2)		WHT amount
total_amount	DECIMAL(15,2)	NOT NULL	Final total
amount_paid	DECIMAL(15,2)	DEFAULT 0	Amount received
balance_due	DECIMAL(15,2)		Remaining balance
notes	TEXT		Invoice notes
terms_and_conditions	TEXT		T&Cs text
billing_period_start	DATE		Service period start
billing_period_end	DATE		Service period end
sent_at	TIMESTAMP		Date/time sent
sent_to	VARCHAR[]		Recipient emails
viewed_at	TIMESTAMP		First view timestamp

Field	Type	Constraints	Description
paid_at	TIMESTAMP		Full payment date
cancelled_at	TIMESTAMP		Cancellation date
cancellation_reason	TEXT		Cancellation reason
pdf_url	VARCHAR(500)		Generated PDF path
created_by	UUID	FK	Creator user ID
created_at	TIMESTAMP	DEFAULT NOW()	Creation timestamp
updated_at	TIMESTAMP		Last update timestamp

6.2.2 Invoice Items Entity

Field	Type	Constraints	Description
id	UUID	PK, auto-generated	Unique item identifier
invoice_id	UUID	FK, NOT NULL	Parent invoice
line_number	INTEGER	NOT NULL	Line order
description	TEXT	NOT NULL	Item description
service_type	VARCHAR(100)		Service category
quantity	DECIMAL(10,2)	DEFAULT 1	Quantity
unit	VARCHAR(50)		Unit (hours, days, units)
unit_price	DECIMAL(15,2)	NOT NULL	Price per unit
discount_percentage	DECIMAL(5,2)		Line discount %
discount_amount	DECIMAL(15,2)		Line discount amount
tax_rate	DECIMAL(5,2)		Line tax rate
tax_amount	DECIMAL(15,2)		Line tax amount
line_total	DECIMAL(15,2)	NOT NULL	Line total
assignment_id	UUID	FK	Related staff assignment
service_log_id	UUID	FK	Related service log
notes	TEXT		Line notes

6.2.3 Payments Entity

Field	Type	Constraints	Description
id	UUID	PK, auto-generated	Unique payment identifier
organization_id	UUID	FK, NOT NULL	Tenant organization
payment_number	VARCHAR(50)	UNIQUE	Auto-generated (PMT-YYYY-NNNN)
invoice_id	UUID	FK, NOT NULL	Related invoice
client_id	UUID	FK, NOT NULL	Client organization
payment_date	DATE	NOT NULL	Date received
amount	DECIMAL(15,2)	NOT NULL	Payment amount
currency	VARCHAR(3)	DEFAULT 'NGN'	Currency code
payment_method	ENUM	NOT NULL	bank_transfer/cheque/cash/online
reference_number	VARCHAR(100)		Bank/cheque reference
bank_name	VARCHAR(100)		Bank name
status	ENUM	NOT NULL	pending/confirmed/failed/reversed
confirmed_by	UUID	FK	Confirmer user ID
confirmed_at	TIMESTAMP		Confirmation date
notes	TEXT		Payment notes
receipt_url	VARCHAR(500)		Receipt document path
wht_certificate_url	VARCHAR(500)		WHT certificate path

Field	Type	Constraints	Description
created_by	UUID	FK	Creator user ID
created_at	TIMESTAMP	DEFAULT NOW()	Creation timestamp
updated_at	TIMESTAMP		Last update timestamp

6.2.4 Tax Rates Entity

Field	Type	Constraints	Description
id	UUID	PK, auto-generated	Unique rate identifier
organization_id	UUID	FK, NOT NULL	Tenant organization
name	VARCHAR(100)	NOT NULL	Tax name (e.g., "VAT", "WHT")
code	VARCHAR(20)	NOT NULL	Tax code
rate	DECIMAL(5,2)	NOT NULL	Tax rate percentage
description	TEXT		Tax description
is_default	BOOLEAN	DEFAULT FALSE	Default tax flag
is_active	BOOLEAN	DEFAULT TRUE	Active flag
effective_from	DATE		Effective start date
effective_to	DATE		Effective end date
created_at	TIMESTAMP	DEFAULT NOW()	Creation timestamp

Default Nigeria Tax Rates: - VAT: 7.5% - WHT (Services): 10% - WHT (Contracts): 5%

6.2.5 Billing Schedules Entity

Field	Type	Constraints	Description
id	UUID	PK, auto-generated	Unique schedule identifier
organization_id	UUID	FK, NOT NULL	Tenant organization
client_id	UUID	FK, NOT NULL	Client organization
engagement_id	UUID	FK	Related engagement
schedule_type	ENUM	NOT NULL	retainer/milestone/usage
frequency	ENUM		weekly/monthly/quarterly/annual
amount	DECIMAL(15,2)	NOT NULL	Billing amount
description	TEXT		Schedule description
start_date	DATE	NOT NULL	Schedule start date
end_date	DATE		Schedule end date
next_invoice_date	DATE		Next scheduled invoice
last_invoice_id	UUID	FK	Last generated invoice
is_active	BOOLEAN	DEFAULT TRUE	Active flag
auto_generate	BOOLEAN	DEFAULT FALSE	Auto-generate invoices
created_at	TIMESTAMP	DEFAULT NOW()	Creation timestamp

6.3 Functional Requirements

6.3.1 Invoice Management

ID	Requirement	Priority
FIN-I001	System shall create invoices linked to clients	Critical

ID	Requirement	Priority
FIN-I002	System shall auto-generate unique invoice numbers	Critical
FIN-I003	System shall support invoice types: standard, proforma, credit note	High
FIN-I004	System shall calculate subtotal from line items	Critical
FIN-I005	System shall apply discounts (percentage or fixed)	High
FIN-I006	System shall calculate VAT at configurable rate	Critical
FIN-I007	System shall calculate WHT where applicable	High
FIN-I008	System shall calculate final total amount	Critical
FIN-I009	System shall track invoice status lifecycle	Critical
FIN-I010	System shall link invoices to engagements	High
FIN-I011	System shall link invoice items to service logs	High
FIN-I012	System shall generate PDF invoices	Critical
FIN-I013	System shall email invoices to billing contacts	High
FIN-I014	System shall track invoice views	Medium
FIN-I015	System shall support invoice cloning/copying	Medium
FIN-I016	System shall support invoice cancellation with reason	High
FIN-I017	System shall auto-calculate due date from payment terms	High
FIN-I018	System shall mark invoices as overdue automatically	Critical
FIN-I019	System shall support multiple currencies (NGN, USD, GBP, EUR)	Medium
FIN-I020	System shall include billing period dates	High

6.3.2 Invoice Line Items

ID	Requirement	Priority
FIN-IL001	System shall add multiple line items per invoice	Critical
FIN-IL002	System shall support quantity and unit price	Critical
FIN-IL003	System shall support line-level discounts	Medium
FIN-IL004	System shall calculate line totals	Critical
FIN-IL005	System shall link items to service logs	High
FIN-IL006	System shall link items to staff assignments	Medium
FIN-IL007	System shall reorder line items	Low

6.3.3 Payment Management

ID	Requirement	Priority
FIN-P001	System shall record payments against invoices	Critical
FIN-P002	System shall auto-generate unique payment numbers	Critical
FIN-P003	System shall support partial payments	Critical
FIN-P004	System shall update invoice balance due	Critical
FIN-P005	System shall mark invoice as paid when balance is zero	Critical

ID	Requirement	Priority
FIN-P006	System shall track payment methods (bank transfer, cheque, cash)	High
FIN-P007	System shall capture bank reference numbers	High
FIN-P008	System shall support payment confirmation workflow	High
FIN-P009	System shall attach payment receipts	High
FIN-P010	System shall attach WHT certificates	High
FIN-P011	System shall reverse payments with reason	High
FIN-P012	System shall reconcile payments across invoices	Medium

6.3.4 Receivables Management

ID	Requirement	Priority
FIN-R001	System shall display receivables aging report	Critical
FIN-R002	System shall categorize receivables by age (current, 30, 60, 90, 120+ days)	Critical
FIN-R003	System shall show receivables by client	High
FIN-R004	System shall alert on overdue invoices	Critical
FIN-R005	System shall send payment reminders	High
FIN-R006	System shall track collection activities	Medium
FIN-R007	System shall calculate days sales outstanding (DSO)	High
FIN-R008	System shall flag high-risk receivables	Medium

6.3.5 Billing Schedules

ID	Requirement	Priority
FIN-BS001	System shall create recurring billing schedules	High
FIN-BS002	System shall support frequencies: weekly, monthly, quarterly, annual	High
FIN-BS003	System shall calculate next invoice date	High
FIN-BS004	System shall auto-generate invoices from schedules	Medium
FIN-BS005	System shall alert on upcoming scheduled invoices	High
FIN-BS006	System shall link schedules to engagements	High
FIN-BS007	System shall deactivate schedules on engagement end	High

6.3.6 Financial Reporting

ID	Requirement	Priority
FIN-FR001	System shall display financial dashboard	Critical
FIN-FR002	System shall show invoiced vs collected amounts	Critical
FIN-FR003	System shall report revenue by client	High

ID	Requirement	Priority
FIN-FR004	System shall report revenue by engagement type	High
FIN-FR005	System shall show revenue trend charts	High
FIN-FR006	System shall export financial reports to Excel	High
FIN-FR007	System shall calculate collection rate	High
FIN-FR008	System shall provide client profitability view	Medium

6.4 User Interface Requirements

6.4.1 Invoice Screens

Screen	Description
Invoice List	Status-filtered table with search
Invoice Create/Edit	Line item builder with calculations
Invoice Detail	View with payment history
Invoice Preview	PDF preview before sending
Invoice PDF	Printable/downloadable format

6.4.2 Payment Screens

Screen	Description
Payment List	Filterable by client, status, date
Payment Record	Form to record payment
Payment Detail	View with attached documents
Payment Confirmation	Approval workflow

6.4.3 Report Screens

Screen	Description
Receivables Aging	Aging buckets with drill-down
Revenue Dashboard	Charts and KPIs
Client Statement	Per-client transaction history
Financial Summary	Period-based summary

6.5 API Specifications

6.5.1 Invoice Endpoints

Method	Endpoint	Description
GET	/api/invoices	List invoices with filters
GET	/api/invoices/:id	Get invoice by ID
POST	/api/invoices	Create invoice
PUT	/api/invoices/:id	Update invoice
DELETE	/api/invoices/:id	Delete draft invoice
POST	/api/invoices/:id/send	Send invoice
PUT	/api/invoices/:id/cancel	Cancel invoice

Method	Endpoint	Description
GET	/api/invoices/:id/pdf	Generate/download PDF
POST	/api/invoices/:id/clone	Clone invoice
GET	/api/invoices/:id/payments	Get invoice payments
GET	/api/clients/:id/invoices	Get client invoices

6.5.2 Payment Endpoints

Method	Endpoint	Description
GET	/api/payments	List payments
GET	/api/payments/:id	Get payment by ID
POST	/api/payments	Record payment
PUT	/api/payments/:id	Update payment
PUT	/api/payments/:id/confirm	Confirm payment
PUT	/api/payments/:id/reverse	Reverse payment
DELETE	/api/payments/:id	Delete payment

6.5.3 Tax Rate Endpoints

Method	Endpoint	Description
GET	/api/tax-rates	List tax rates
GET	/api/tax-rates/:id	Get tax rate
POST	/api/tax-rates	Create tax rate
PUT	/api/tax-rates/:id	Update tax rate
DELETE	/api/tax-rates/:id	Delete tax rate

6.5.4 Billing Schedule Endpoints

Method	Endpoint	Description
GET	/api/billing-schedules	List schedules
GET	/api/billing-schedules/:id	Get schedule
POST	/api/billing-schedules	Create schedule
PUT	/api/billing-schedules/:id	Update schedule
DELETE	/api/billing-schedules/:id	Delete schedule
POST	/api/billing-schedules/:id/generate	Generate invoice

6.5.5 Report Endpoints

Method	Endpoint	Description
GET	/api/reports/receivables-aging	Aging report
GET	/api/reports/revenue-summary	Revenue summary
GET	/api/reports/client-statement/:clientId	Client statement
GET	/api/reports/financial-dashboard	Dashboard data

6.6 Business Rules

ID	Rule	Enforcement
BR-FIN001	Invoice number must be unique	Database constraint
BR-FIN002	Sent invoices cannot be edited (only cancelled)	API validation
BR-FIN003	Payment amount cannot exceed invoice balance	API validation
BR-FIN004	VAT rate must be between 0 and 100	Database check
BR-FIN005	Due date must be on or after issue date	API validation
BR-FIN006	Credit note must reference original invoice	API validation
BR-FIN007	Confirmed payments cannot be deleted	API validation
BR-FIN008	Cancelled invoices cannot receive payments	API validation

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7. Module 1.5: Collaboration & Workflow Layer

7.1 Module Overview

The Collaboration & Workflow Layer provides cross-cutting functionality that enables notes, comments, approval workflows, notifications, and task management across all other modules. This is a foundational module that all other modules depend on for collaboration features.

Priority: CRITICAL - Cross-cutting **Estimated Effort:** 2-3 sprints (4-6 weeks) **Reuse Source:** Workforce approval patterns (40%)

7.2 Data Entities

7.2.1 Notes Entity (Polymorphic)

Field	Type	Constraints	Description
id	UUID	PK, auto-generated	Unique note identifier
organization_id	UUID	FK, NOT NULL	Tenant organization
entity_type	VARCHAR(50)	NOT NULL	client/engagement/lead/invoice/etc
entity_id	UUID	NOT NULL	Associated entity ID
content	TEXT	NOT NULL	Note content (markdown supported)
is_pinned	BOOLEAN	DEFAULT FALSE	Pinned note flag
visibility	ENUM	DEFAULT 'internal'	internal/team/public
mentions	UUID[]		Mentioned user IDs
attachments	JSONB		Attachment references
created_by	UUID	FK, NOT NULL	Creator user ID
created_at	TIMESTAMP	DEFAULT NOW()	Creation timestamp
updated_at	TIMESTAMP		Last update timestamp
deleted_at	TIMESTAMP		Soft delete timestamp

7.2.2 Comments Entity (Threaded)

Field	Type	Constraints	Description
id	UUID	PK, auto-generated	Unique comment identifier
organization_id	UUID	FK, NOT NULL	Tenant organization
entity_type	VARCHAR(50)	NOT NULL	Parent entity type
entity_id	UUID	NOT NULL	Parent entity ID
parent_comment_id	UUID	FK	Parent comment (for threads)
content	TEXT	NOT NULL	Comment content
mentions	UUID[]		Mentioned user IDs
reactions	JSONB		Emoji reactions
is_resolved	BOOLEAN	DEFAULT FALSE	Resolved flag
resolved_by	UUID	FK	Resolver user ID
resolved_at	TIMESTAMP		Resolution timestamp
created_by	UUID	FK, NOT NULL	Creator user ID
created_at	TIMESTAMP	DEFAULT NOW()	Creation timestamp
updated_at	TIMESTAMP		Last update timestamp
deleted_at	TIMESTAMP		Soft delete timestamp

7.2.3 Approval Workflows Entity

Field	Type	Constraints	Description
id	UUID	PK, auto-generated	Unique workflow identifier
organization_id	UUID	FK, NOT NULL	Tenant organization
name	VARCHAR(100)	NOT NULL	Workflow name
description	TEXT		Workflow description
entity_type	VARCHAR(50)	NOT NULL	Target entity type
trigger_conditions	JSONB		When to trigger
is_active	BOOLEAN	DEFAULT TRUE	Active flag
created_at	TIMESTAMP	DEFAULT NOW()	Creation timestamp
updated_at	TIMESTAMP		Last update timestamp

7.2.4 Approval Steps Entity

Field	Type	Constraints	Description
id	UUID	PK, auto-generated	Unique step identifier
workflow_id	UUID	FK, NOT NULL	Parent workflow
step_order	INTEGER	NOT NULL	Step sequence
name	VARCHAR(100)	NOT NULL	Step name
approver_type	ENUM	NOT NULL	user/role/department/manager
approver_id	UUID		Specific user ID
approver_role	VARCHAR(50)		Role name
is_optional	BOOLEAN	DEFAULT FALSE	Optional step
auto_approve_after_days	INTEGER		Auto-approve timeout
escalation_after_days	INTEGER		Escalation timeout
escalation_to	UUID	FK	Escalation user
created_at	TIMESTAMP	DEFAULT NOW()	Creation timestamp

7.2.5 Approval Requests Entity

Field	Type	Constraints	Description
id	UUID	PK, auto-generated	Unique request identifier
organization_id	UUID	FK, NOT NULL	Tenant organization
workflow_id	UUID	FK, NOT NULL	Source workflow
entity_type	VARCHAR(50)	NOT NULL	Target entity type
entity_id	UUID	NOT NULL	Target entity ID
current_step	INTEGER		Current step number
status	ENUM	NOT NULL	pending/approved/rejected/cancelled
requested_by	UUID	FK, NOT NULL	Requester user ID
requested_at	TIMESTAMP	DEFAULT NOW()	Request timestamp
completed_at	TIMESTAMP		Completion timestamp
notes	TEXT		Request notes

7.2.6 Approval Decisions Entity

Field	Type	Constraints	Description
id	UUID	PK, auto-generated	Unique decision identifier
request_id	UUID	FK, NOT NULL	Parent request
step_id	UUID	FK, NOT NULL	Approval step
decision	ENUM	NOT NULL	approved/rejected/delegated
decided_by	UUID	FK, NOT NULL	Decider user ID
decided_at	TIMESTAMP	DEFAULT NOW()	Decision timestamp
delegated_to	UUID	FK	Delegation target
comments	TEXT		Decision comments
attachments	JSONB		Supporting documents

7.2.7 Notifications Entity

Field	Type	Constraints	Description
id	UUID	PK, auto-generated	Unique notification identifier
organization_id	UUID	FK, NOT NULL	Tenant organization
user_id	UUID	FK, NOT NULL	Recipient user
notification_type	ENUM	NOT NULL	approval/task/mention/alert/reminder
title	VARCHAR(255)	NOT NULL	Notification title
message	TEXT	NOT NULL	Notification content
entity_type	VARCHAR(50)		Related entity type
entity_id	UUID		Related entity ID
action_url	VARCHAR(500)		Click action URL
is_read	BOOLEAN	DEFAULT FALSE	Read flag
read_at	TIMESTAMP		Read timestamp
is_email_sent	BOOLEAN	DEFAULT FALSE	Email sent flag
email_sent_at	TIMESTAMP		Email timestamp
priority	ENUM	DEFAULT ‘normal’	low/normal/high/urgent
expires_at	TIMESTAMP		Expiration date
created_at	TIMESTAMP	DEFAULT NOW()	Creation timestamp

7.2.8 Tasks Entity

Field	Type	Constraints	Description
id	UUID	PK, auto-generated	Unique task identifier
organization_id	UUID	FK, NOT NULL	Tenant organization
task_number	VARCHAR(50)	UNIQUE	Auto-generated (TSK-YYYY-NNNN)
title	VARCHAR(255)	NOT NULL	Task title
description	TEXT		Task description
entity_type	VARCHAR(50)		Related entity type
entity_id	UUID		Related entity ID
status	ENUM	NOT NULL	open/in_progress/blocked/completed/cancelled
priority	ENUM	DEFAULT 'medium'	low/medium/high/critical
assigned_to	UUID	FK	Assignee user ID
assigned_by	UUID	FK	Assigner user ID
due_date	TIMESTAMP		Due date/time
reminder_date	TIMESTAMP		Reminder date
estimated_hours	DECIMAL(5,2)		Estimated effort
actual_hours	DECIMAL(5,2)		Actual effort
completed_at	TIMESTAMP		Completion timestamp
completed_by	UUID	FK	Completer user ID
tags	VARCHAR[]		Task tags
checklist	JSONB		Subtasks checklist
attachments	JSONB		Attachment references
recurrence	JSONB		Recurrence pattern
created_by	UUID	FK, NOT NULL	Creator user ID
created_at	TIMESTAMP	DEFAULT NOW()	Creation timestamp
updated_at	TIMESTAMP		Last update timestamp

7.2.9 Audit Logs Entity

Field	Type	Constraints	Description
id	UUID	PK, auto-generated	Unique log identifier
organization_id	UUID	FK, NOT NULL	Tenant organization
user_id	UUID	FK	Actor user ID
action	VARCHAR(50)	NOT NULL	create/update/delete/view/export
entity_type	VARCHAR(50)	NOT NULL	Target entity type
entity_id	UUID	NOT NULL	Target entity ID
entity_name	VARCHAR(255)		Entity display name
old_values	JSONB		Previous values
new_values	JSONB		New values
ip_address	VARCHAR(45)		Client IP
user_agent	TEXT		Browser/client info
created_at	TIMESTAMP	DEFAULT NOW()	Timestamp

7.3 Functional Requirements

7.3.1 Notes Management

ID	Requirement	Priority
WF-N001	System shall create notes on any entity (polymorphic)	Critical
WF-N002	System shall support markdown formatting in notes	High
WF-N003	System shall pin important notes to top	High
WF-N004	System shall support note visibility levels	High
WF-N005	System shall mention users in notes (@username)	High
WF-N006	System shall notify mentioned users	High
WF-N007	System shall attach files to notes	Medium
WF-N008	System shall edit and delete own notes	High
WF-N009	System shall display notes timeline per entity	Critical
WF-N010	System shall search notes content	Medium

7.3.2 Comments Management

ID	Requirement	Priority
WF-C001	System shall support threaded comments	High
WF-C002	System shall reply to existing comments	High
WF-C003	System shall mention users in comments	High
WF-C004	System shall support emoji reactions	Low
WF-C005	System shall mark comments as resolved	High
WF-C006	System shall collapse resolved comment threads	Medium
WF-C007	System shall notify on replies and mentions	High

7.3.3 Approval Workflows

ID	Requirement	Priority
WF-A001	System shall define configurable approval workflows	Critical
WF-A002	System shall support multi-step sequential approvals	Critical
WF-A003	System shall assign approvers by user, role, or department	High
WF-A004	System shall support parallel approvals (any/all)	Medium
WF-A005	System shall notify approvers of pending requests	Critical
WF-A006	System shall allow approval with comments	High
WF-A007	System shall allow rejection with mandatory reason	High
WF-A008	System shall support delegation to another user	High
WF-A009	System shall auto-escalate after timeout	High
WF-A010	System shall auto-approve after timeout (configurable)	Medium
WF-A011	System shall track approval history	Critical
WF-A012	System shall cancel pending approvals	High
WF-A013	System shall show approval status on entity	Critical

7.3.4 Notifications

ID	Requirement	Priority
WF-NT001	System shall display in-app notification bell	Critical
WF-NT002	System shall show unread notification count	Critical
WF-NT003	System shall mark notifications as read	Critical
WF-NT004	System shall send email notifications	Critical
WF-NT005	System shall support notification preferences per user	High
WF-NT006	System shall prioritize notifications (low/normal/high/urgent)	High
WF-NT007	System shall link notifications to source entities	Critical
WF-NT008	System shall group related notifications	Medium
WF-NT009	System shall expire old notifications	Medium
WF-NT010	System shall support notification digest emails	Low

7.3.5 Task Management

ID	Requirement	Priority
WF-T001	System shall create tasks with title and description	Critical
WF-T002	System shall auto-generate unique task numbers	Critical
WF-T003	System shall assign tasks to users	Critical
WF-T004	System shall set task due dates	Critical
WF-T005	System shall set task priorities	High
WF-T006	System shall track task status	Critical
WF-T007	System shall link tasks to entities	High
WF-T008	System shall set task reminders	High
WF-T009	System shall estimate and track time	Medium
WF-T010	System shall support subtask checklists	Medium
WF-T011	System shall attach files to tasks	Medium
WF-T012	System shall comment on tasks	High
WF-T013	System shall display my tasks dashboard	Critical
WF-T014	System shall display team tasks view	High
WF-T015	System shall send due date reminders	Critical
WF-T016	System shall support recurring tasks	Medium
WF-T017	System shall filter tasks by status, assignee, priority, due date	High
WF-T018	System shall export tasks	Low

7.3.6 Audit Trail

ID	Requirement	Priority
WF-AU001	System shall log all data modifications	Critical
WF-AU002	System shall capture before/after values	Critical
WF-AU003	System shall record acting user	Critical
WF-AU004	System shall record timestamp	Critical
WF-AU005	System shall record IP address	High
WF-AU006	System shall record user agent	Medium

ID	Requirement	Priority
WF-AU007	System shall display audit history per entity	Critical
WF-AU008	System shall search audit logs	High
WF-AU009	System shall export audit logs	High
WF-AU010	System shall retain audit logs per policy	Critical

7.4 User Interface Requirements

7.4.1 Notes & Comments

Screen	Description
Notes Panel	Collapsible panel on entity detail pages
Note Editor	Rich text editor with markdown preview
Comments Thread	Nested comment display with reply

7.4.2 Approval Screens

Screen	Description
My Approvals	List of pending approval requests
Approval Detail	Request details with approve/reject actions
Approval History	Timeline of decisions
Workflow Config	Admin workflow builder

7.4.3 Notification Screens

Screen	Description
Notification Bell	Header dropdown with recent
Notification List	Full notification history
Notification Settings	User preferences

7.4.4 Task Screens

Screen	Description
My Tasks	Personal task list with filters
Task Create/Edit	Task form with all fields
Task Detail	Full view with checklist, comments
Team Tasks	Team view for managers
Task Kanban	Board view by status

7.5 API Specifications

7.5.1 Notes Endpoints

Method	Endpoint	Description
GET	/api/notes	List notes with filters
GET	/api/notes/:id	Get note by ID

Method	Endpoint	Description
POST	/api/notes	Create note
PUT	/api/notes/:id	Update note
DELETE	/api/notes/:id	Delete note
PUT	/api/notes/:id/pin	Pin/unpin note
GET	/api/:entityType/:entityId/notes	Get entity notes

7.5.2 Comments Endpoints

Method	Endpoint	Description
GET	/api/:entityType/:entityId/comments	List comments
POST	/api/comments	Create comment
PUT	/api/comments/:id	Update comment
DELETE	/api/comments/:id	Delete comment
PUT	/api/comments/:id/resolve	Resolve comment
POST	/api/comments/:id/react	Add reaction

7.5.3 Approval Endpoints

Method	Endpoint	Description
GET	/api/approvals/workflows	List workflows
POST	/api/approvals/workflows	Create workflow
PUT	/api/approvals/workflows/:id	Update workflow
GET	/api/approvals/requests	List my approval requests
GET	/api/approvals/requests/:id	Get request details
POST	/api/approvals/requests	Create request
PUT	/api/approvals/requests/:id/approve	Approve
PUT	/api/approvals/requests/:id/reject	Reject
PUT	/api/approvals/requests/:id/delegate	Delegate
PUT	/api/approvals/requests/:id/cancel	Cancel

7.5.4 Notification Endpoints

Method	Endpoint	Description
GET	/api/notifications	List notifications
GET	/api/notifications/unread-count	Get unread count
PUT	/api/notifications/:id/read	Mark as read
PUT	/api/notifications/read-all	Mark all as read
DELETE	/api/notifications/:id	Delete notification
GET	/api/notifications/preferences	Get preferences
PUT	/api/notifications/preferences	Update preferences

7.5.5 Task Endpoints

Method	Endpoint	Description
GET	/api/tasks	List tasks with filters

Method	Endpoint	Description
GET	/api/tasks/:id	Get task by ID
POST	/api/tasks	Create task
PUT	/api/tasks/:id	Update task
PUT	/api/tasks/:id/status	Update status
PUT	/api/tasks/:id/assign	Assign task
DELETE	/api/tasks/:id	Delete task
GET	/api/tasks/my-tasks	Get my tasks
GET	/api/tasks/team	Get team tasks
POST	/api/tasks/:id/comments	Add task comment
PUT	/api/tasks/:id/checklist	Update checklist

7.5.6 Audit Endpoints

Method	Endpoint	Description
GET	/api/audit-logs	List audit logs
GET	/api/audit-logs/:entityType/:entityId	Get entity history
GET	/api/audit-logs/export	Export audit logs

7.6 Business Rules

ID	Rule	Enforcement
BR-WF001	User can only edit/delete own notes	API validation
BR-WF002	Approval decisions cannot be changed once made	API validation
BR-WF003	Delegation cannot create circular references	API validation
BR-WF004	Task due date cannot be in the past when creating	API validation
BR-WF005	Completed tasks cannot be assigned to others	API validation
BR-WF006	Audit logs cannot be modified or deleted	Database constraint
BR-WF007	Notifications older than 90 days auto-expire	Scheduled job
BR-WF008	Admin notes are visible only to admin roles	API validation

---

8. Data Requirements

8.1 Entity Relationship Diagram

Entity Groups:

- **CRM Entities**: Clients, Contacts (core customer data)
- **Sales Pipeline**: Leads, Opportunities, Proposals (business development flow)

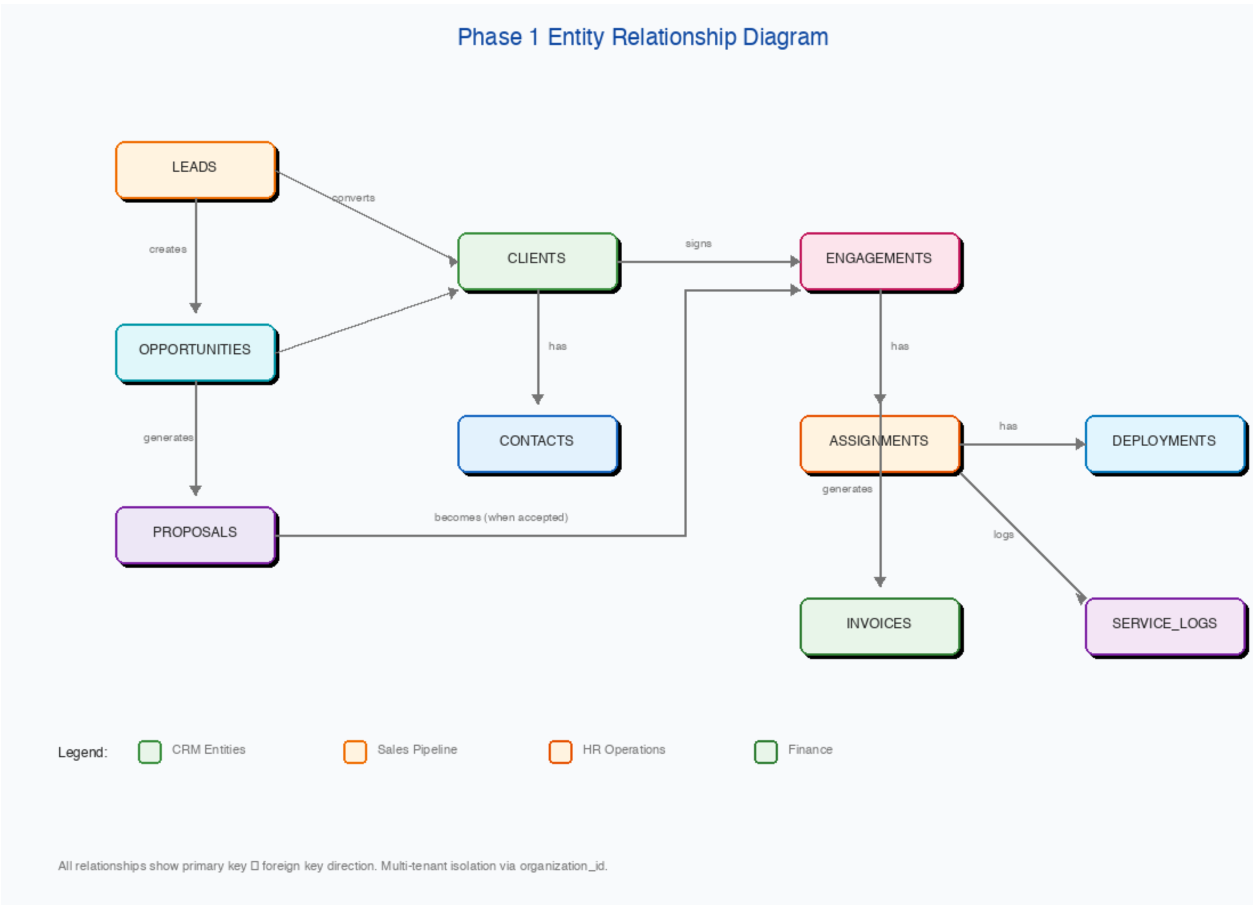

Figure 2: Entity Relationship Diagram

- **HR Operations**: Engagements, Assignments, Deployments, Service Logs
- **Finance**: Invoices, Payments (billing and receivables)
- **Cross-Cutting**: Notes, Comments, Approvals, Tasks, Documents, Activities, Audit Logs (polymorphic entities that attach to any primary entity)

8.2 Database Schema Design

8.2.1 Multi-Tenant Strategy

```sql
-- Schema per tenant
CREATE SCHEMA tenant_{org_id};

-- All tables include organization_id
CREATE TABLE tenant_{org_id}.clients (
    id UUID PRIMARY KEY DEFAULT gen_random_uuid(),
    organization_id UUID NOT NULL REFERENCES public.organizations(id),
    ...
);

-- Row-level security policy
CREATE POLICY tenant_isolation ON clients
    USING (organization_id = current_setting('app.current_org')::uuid);
```

8.2.2 Common Patterns

```sql
-- Soft delete pattern
deleted_at TIMESTAMP DEFAULT NULL

-- Audit columns
created_by UUID REFERENCES users(id),
created_at TIMESTAMP DEFAULT NOW(),
updated_at TIMESTAMP,

-- Check constraint example
CONSTRAINT positive_amount CHECK (amount >= 0)

-- Enum type example
CREATE TYPE client_status AS ENUM ('prospect', 'active', 'inactive', 'former');
```

8.3 Data Migration Requirements

ID	Requirement	Priority
DM001	System shall support data import from Excel/CSV	High
DM002	System shall validate imported data before commit	Critical
DM003	System shall generate import error reports	High
DM004	System shall support incremental data import	Medium
DM005	System shall map imported fields to system fields	High

8.4 Data Retention

Data Type	Retention Period	Action
Active records	Indefinite	N/A
Soft-deleted records	1 year	Permanent delete
Audit logs	7 years	Archive then delete
Notifications	90 days	Auto-delete
Session logs	30 days	Auto-delete

---

9. Non-Functional Requirements

9.1 Performance Requirements

ID	Requirement	Target
PERF-001	Page load time	< 3 seconds
PERF-002	API response time (simple queries)	< 200ms
PERF-003	API response time (complex queries)	< 1 second
PERF-004	Report generation	< 10 seconds
PERF-005	PDF generation	< 5 seconds
PERF-006	File upload (25MB)	< 30 seconds
PERF-007	Search results	< 500ms
PERF-008	Concurrent users per tenant	50+
PERF-009	Database queries per page	< 10
PERF-010	Frontend bundle size	< 500KB gzipped

9.2 Scalability Requirements

ID	Requirement	Target
SCAL-001	Total tenants supported	100+
SCAL-002	Records per tenant	100,000+
SCAL-003	Concurrent global users	1,000+
SCAL-004	Daily API calls	1,000,000+
SCAL-005	Document storage per tenant	10GB+
SCAL-006	Horizontal scaling	Docker + load balancer ready

9.3 Availability Requirements

ID	Requirement	Target
AVAIL-001	System uptime	99.5%
AVAIL-002	Planned maintenance window	< 4 hours/month
AVAIL-003	Unplanned downtime recovery	< 1 hour
AVAIL-004	Data backup frequency	Daily
AVAIL-005	Backup retention	30 days
AVAIL-006	Point-in-time recovery	7 days

9.4 Usability Requirements

ID	Requirement	Priority
USE-001	Responsive design (mobile, tablet, desktop)	Critical
USE-002	WCAG 2.1 AA accessibility compliance	High
USE-003	Keyboard navigation support	High
USE-004	Consistent UI patterns across modules	Critical
USE-005	Contextual help and tooltips	Medium
USE-006	Loading indicators for async operations	High
USE-007	Form validation with clear error messages	Critical
USE-008	Confirmation dialogs for destructive actions	Critical
USE-009	Undo capability for recent actions	Low
USE-010	Dark mode support	Low

9.5 Reliability Requirements

ID	Requirement	Priority
REL-001	Graceful error handling (no crashes)	Critical
REL-002	Automatic session recovery	High
REL-003	Data validation at all entry points	Critical
REL-004	Transaction rollback on failure	Critical
REL-005	Idempotent API operations	High
REL-006	Retry logic for external services	High

9.6 Maintainability Requirements

ID	Requirement	Priority
MAIN-001	Code documentation (JSDoc)	High
MAIN-002	API documentation (OpenAPI/Swagger)	Critical
MAIN-003	Database migration scripts	Critical
MAIN-004	Environment-based configuration	Critical
MAIN-005	Structured logging	Critical
MAIN-006	Health check endpoints	Critical
MAIN-007	Automated testing (unit, integration)	High
MAIN-008	CI/CD pipeline	Critical

---

10. External Interface Requirements

10.1 User Interfaces

Interface	Description
Web Application	Primary interface - React SPA
Mobile Web	Responsive design for mobile browsers
PDF Documents	Generated invoices, proposals, reports
Email Templates	Notification and communication emails

10.2 Hardware Interfaces

Interface	Description
File Upload	Support for standard file input devices
Printer	Browser-based printing for reports

10.3 Software Interfaces

System	Interface Type	Purpose
Rozitech Auth Server	REST API	Authentication and authorization
Rozitech Workforce	Database	Employee data (read-only)
Email Provider (SendGrid/Mailgun)	REST API	Email delivery
Cloud Storage (S3/GCS)	SDK	Document storage
PDF Generator (Puppeteer/WeasyPrint)	Library	PDF generation

10.4 Communication Interfaces

Protocol	Usage
HTTPS	All API and web traffic
WSS	Real-time notifications (future)
SMTP	Outbound email via provider

10.5 Integration Stubs (Phase 1)

These integrations will be stubbed in Phase 1 for future implementation:

Integration	Purpose	Phase
QuickBooks Online	Accounting sync	Phase 2+
Xero	Accounting sync	Phase 2+
Sage	Accounting sync	Phase 2+
Outlook/Gmail	Email sync	Phase 2+
SMS Gateway	SMS notifications	Phase 2+
Calendar (Google/Outlook)	Meeting scheduling	Phase 2+
Payment Gateway (Paystack/Flutterwave)	Online payments	Phase 2+

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11. Security Requirements

11.1 Authentication

ID	Requirement	Priority
SEC-A001	JWT-based authentication via Rozitech Auth Server	Critical
SEC-A002	Token expiration (1 hour access, 7 days refresh)	Critical
SEC-A003	Secure token storage (httpOnly cookies or secure storage)	Critical

ID	Requirement	Priority
SEC-A004	Session invalidation on logout	Critical
SEC-A005	Multi-tenant context in JWT claims	Critical
SEC-A006	Password complexity requirements (8+ chars, mixed)	High
SEC-A007	Account lockout after 5 failed attempts	High
SEC-A008	Two-factor authentication support	Medium

11.2 Authorization

ID	Requirement	Priority
SEC-Z001	Role-based access control (RBAC)	Critical
SEC-Z002	Permission-based granular access	High
SEC-Z003	Tenant data isolation (organization_id)	Critical
SEC-Z004	Resource-level authorization checks	Critical
SEC-Z005	API endpoint authorization middleware	Critical
SEC-Z006	UI element visibility based on permissions	High

11.3 Data Protection

ID	Requirement	Priority
SEC-D001	HTTPS encryption for all traffic	Critical
SEC-D002	Database connection encryption (TLS)	Critical
SEC-D003	Sensitive data encryption at rest	High
SEC-D004	File upload virus scanning	Medium
SEC-D005	PII data masking in logs	Critical
SEC-D006	Secure file storage with access control	Critical

11.4 Input Validation

ID	Requirement	Priority
SEC-V001	Server-side input validation on all endpoints	Critical
SEC-V002	SQL injection prevention (parameterized queries)	Critical
SEC-V003	XSS prevention (input sanitization, CSP)	Critical
SEC-V004	CSRF protection	Critical
SEC-V005	File upload type validation	Critical
SEC-V006	Rate limiting on API endpoints	High
SEC-V007	Request size limits	High

11.5 Audit and Compliance

ID	Requirement	Priority
SEC-C001	Complete audit trail of data changes	Critical
SEC-C002	User action logging	Critical
SEC-C003	Login/logout event logging	Critical

ID	Requirement	Priority
SEC-C004	Failed authentication attempt logging	Critical
SEC-C005	Audit log tamper protection	Critical
SEC-C006	Data export logging	High
SEC-C007	NDPR compliance (Nigeria data protection)	Critical

11.6 Security Roles

Role	Permissions
System Admin	Full access, user management, system configuration
Organization Admin	Full tenant access, user management
Manager	Full access to assigned modules, team management
Staff	Create/edit assigned records, view team records
Read-Only	View access only, export capability
Auditor	Read-only access to all data and audit logs

---

12. Appendices

Appendix A: Glossary

Term	Definition
Account Manager	TeamACE employee responsible for client relationship
Assignment	Linking of a TeamACE employee to work at a client
Billing Schedule	Recurring billing arrangement with a client
Client	Company that TeamACE provides services to
Contact	Individual person at a client company
Deployment	Physical location where staff member works
Engagement	Project or contract with a client
Lead	Potential client not yet converted
Opportunity	Qualified sales prospect with value
Outsourced Staff	TeamACE employees working at client sites
Pipeline	Visual representation of sales opportunities
Proposal	Formal offer document to a prospect
Receivable	Money owed to TeamACE by clients
Service Log	Record of services rendered to a client
Tenant	Organization using the TeamACE platform

Appendix B: Sprint Deliverables

Sprint	Module Focus	Key Deliverables
1-2	Core CRM Base	Client + Contact CRUD, basic UI
3-4	Core CRM + BD	Engagement, Activity, Lead capture
5-6	BD Pipeline	Pipeline board, Proposals, Forecasting
7-8	HR Outsourcing	Assignment, Deployment, Service logs
9-10	Finance Light	Invoicing, Payments, Receivables
11-12	Workflow Layer	Approvals, Notifications, Tasks

Appendix C: Test Scenarios

C.1 Client Management Test Scenarios

TC ID	Scenario	Expected Result
TC-C001	Create new client with valid data	Client created, number generated
TC-C002	Create client with duplicate registration number	Error: duplicate
TC-C003	Update client status from prospect to active	Status updated, activity logged
TC-C004	Delete client with active engagements	Error: cannot delete
TC-C005	Search clients by partial name	Matching clients returned
TC-C006	Export clients to CSV	Valid CSV downloaded

C.2 Invoice Management Test Scenarios

TC ID	Scenario	Expected Result
TC-I001	Create invoice with line items	Total calculated correctly
TC-I002	Apply 10% discount to invoice	Discount applied, total updated
TC-I003	Add VAT to invoice	7.5% VAT calculated
TC-I004	Record partial payment	Balance updated, status partial
TC-I005	Mark invoice as paid	Status changed, paid_at set
TC-I006	Cancel sent invoice	Status cancelled, reason recorded

Appendix D: Wireframe Specifications

This section provides detailed wireframe specifications for all Phase 1 screens. All wireframes are provided as PNG images in the `wireframes/` directory.

D.1 Global Navigation & Layout The global layout establishes the consistent structure used across all screens, featuring a collapsible sidebar navigation, top header with search and notifications, and a main content area.

Layout Components: - **Header Bar**: Logo, global search, notifications bell, user menu - **Sidebar Navigation**: Collapsible, with expandable sub-menus for BD/Sales, HR Outsourcing, and Finance - **Main Content Area**: Responsive container with breadcrumb navigation - **Footer**: Copyright, help links, version info

D.2 Client Management Screens **D.2.1 Client List Screen**

The client list provides a searchable, filterable view of all clients with key information at a glance.

Key Features: - Search by company name, contact, or any field - Filter by client type, tier, and status - Sortable columns - Quick action menu (view, edit, delete) - Pagination controls

D.2.2 Client Detail Screen

The client detail screen provides a comprehensive 360-degree view of a client with tabbed navigation to related data.

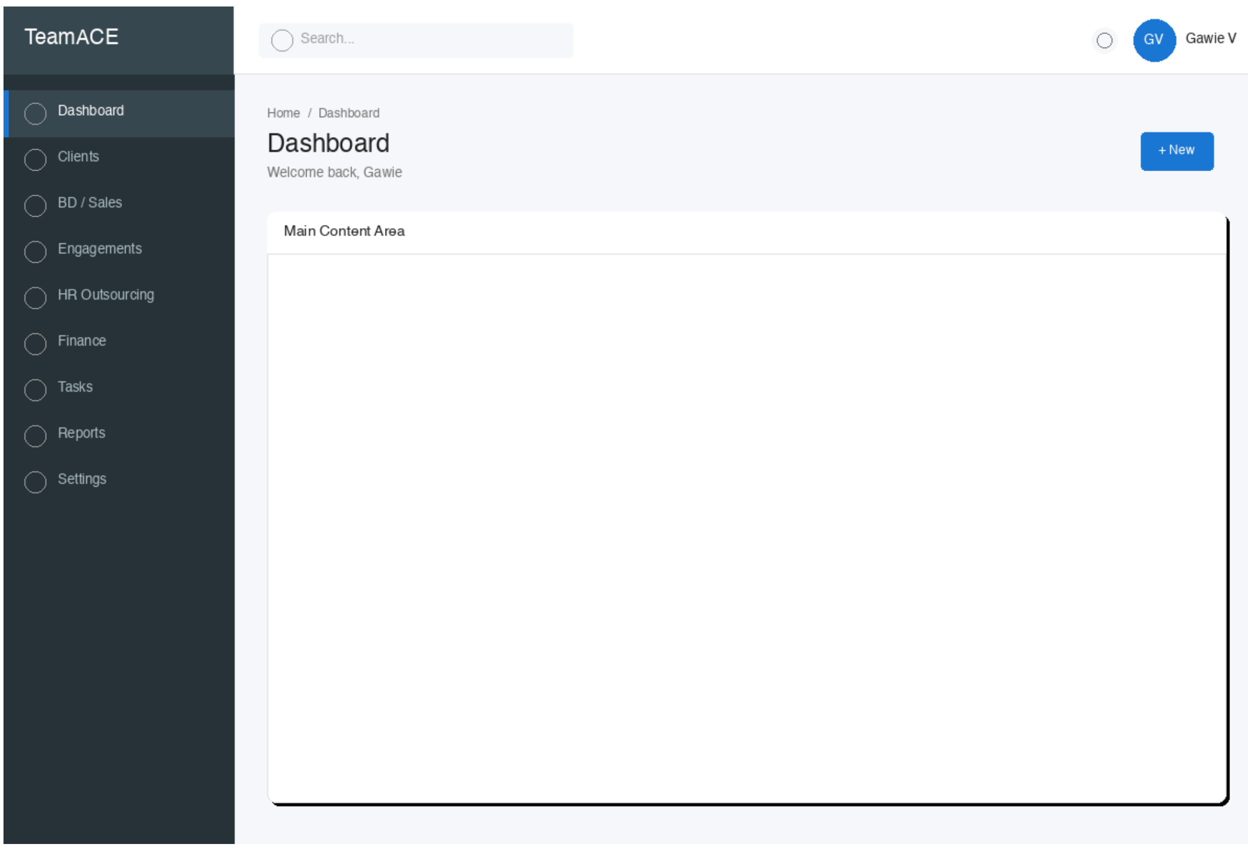

Figure 3: Global Layout

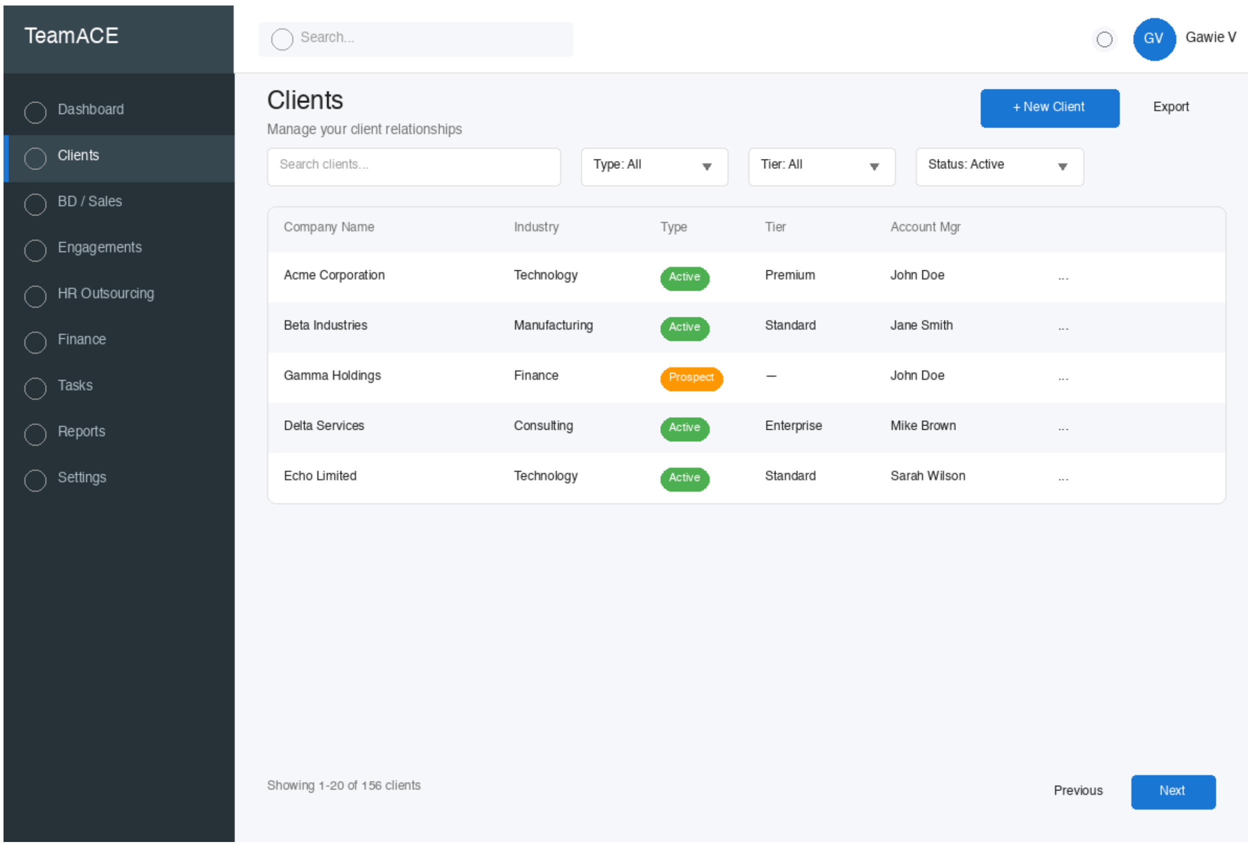

Figure 4: Client List

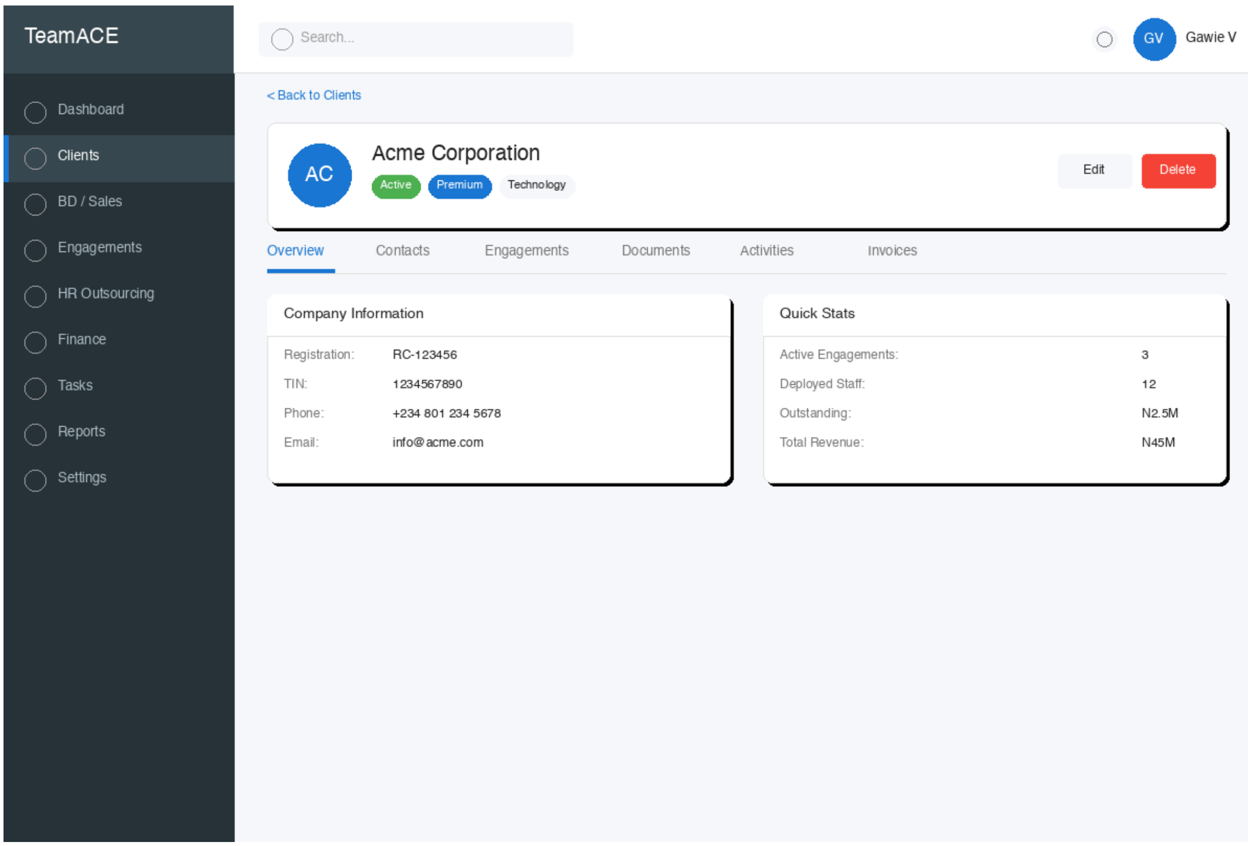

Figure 5: Client Detail

Sections: - Company information with logo - Quick stats (engagements, staff, revenue, outstanding) - Primary contact details - Tabbed navigation: Overview, Contacts, Engagements, Documents, Activities, Invoices

D.2.3 Client Create/Edit Form

The client form captures all essential information organized into logical sections with validation indicators.

D.3 Business Development Screens

D.3.1 Pipeline Kanban Board

The pipeline view provides a visual drag-and-drop interface for managing sales opportunities through different stages.

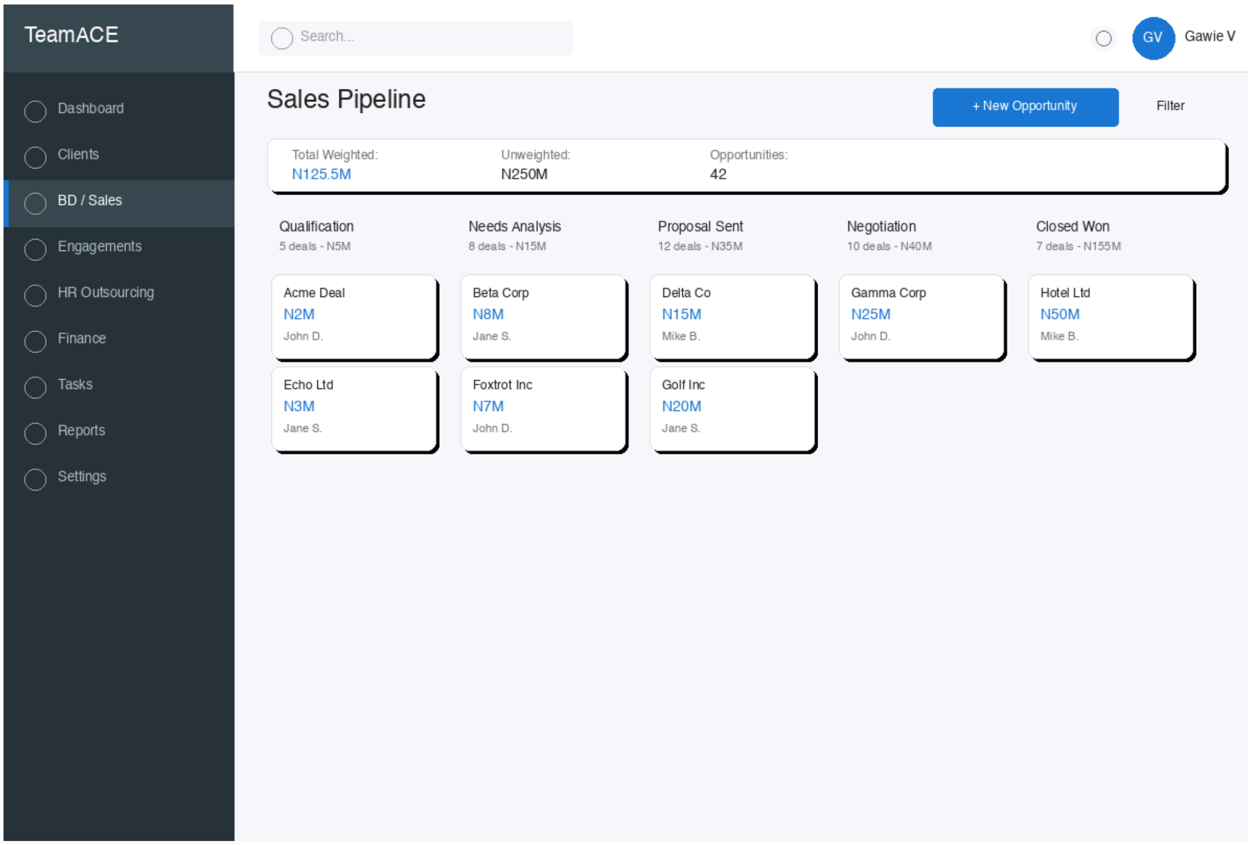

Figure 6: Pipeline Kanban

Features: - Drag-and-drop opportunity cards between stages - Stage summary showing count and weighted value - Quick filters by owner, client, or date range - Opportunity cards showing key metrics (value, owner, days in stage) - Won/Lost columns for closed opportunities

D.3.2 Lead Capture Form

The lead form captures initial prospect information with required fields and source tracking.

Form Sections: - Lead source with detailed attribution - Company information - Contact person details - Service interests (multi-select checkboxes) - Assignment and notes

D.3.3 Proposal Builder

Multi-step proposal creation with preview capability and document generation.

D.4 HR Outsourcing Screens D.4.1 Assignment List

View and manage all staff assignments with filtering by client, status, and assignment type.

List Features: - Employee-client relationship view - Status indicators (Active, On Hold, Completed) - Quick filters and search - Pagination and sorting

D.4.2 Assignment Detail

Comprehensive view of a staff assignment with financial metrics, deployment history, and service logs.

D.5 Finance Screens D.5.1 Invoice List

The invoice list provides comprehensive management of all invoices with status-based filtering and summary statistics.

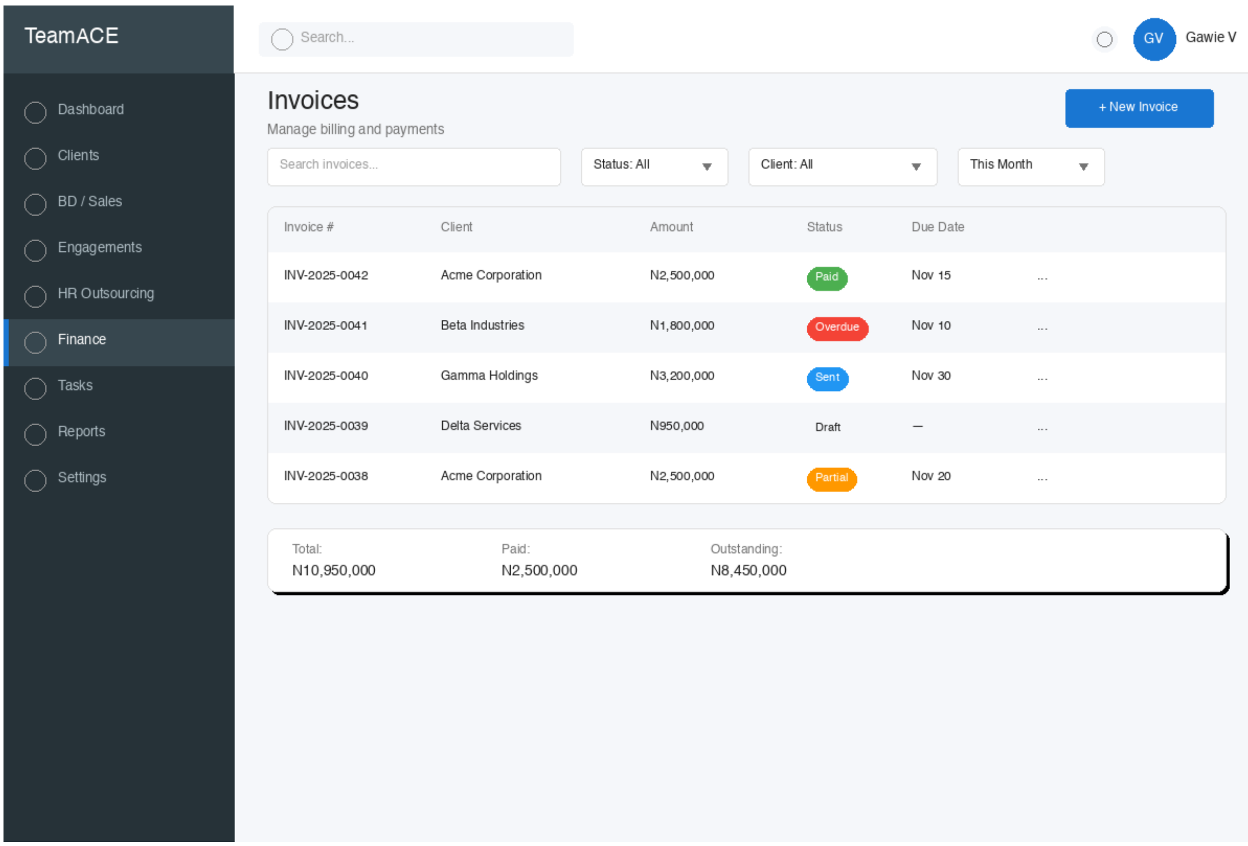

Figure 7: Invoice List

Features: - Color-coded status badges (Draft, Sent, Paid, Overdue, Partial) - Filter by status, client, and date range - Summary totals at bottom (Total, Paid, Outstanding) - Quick actions for each invoice

D.5.2 Invoice Create/Edit

Full invoice creation with line items, automatic tax calculations (VAT, WHT), and Nigerian currency formatting.

Form Features: - Client and engagement selection - Date fields with payment term auto-calculation - Dynamic line items with add/remove - Automatic tax calculations (VAT 7.5%, WHT 5%) - Preview before sending

D.5.3 Receivables Aging Report

Standard aging report with 30/60/90+ day buckets and client-level breakdown.

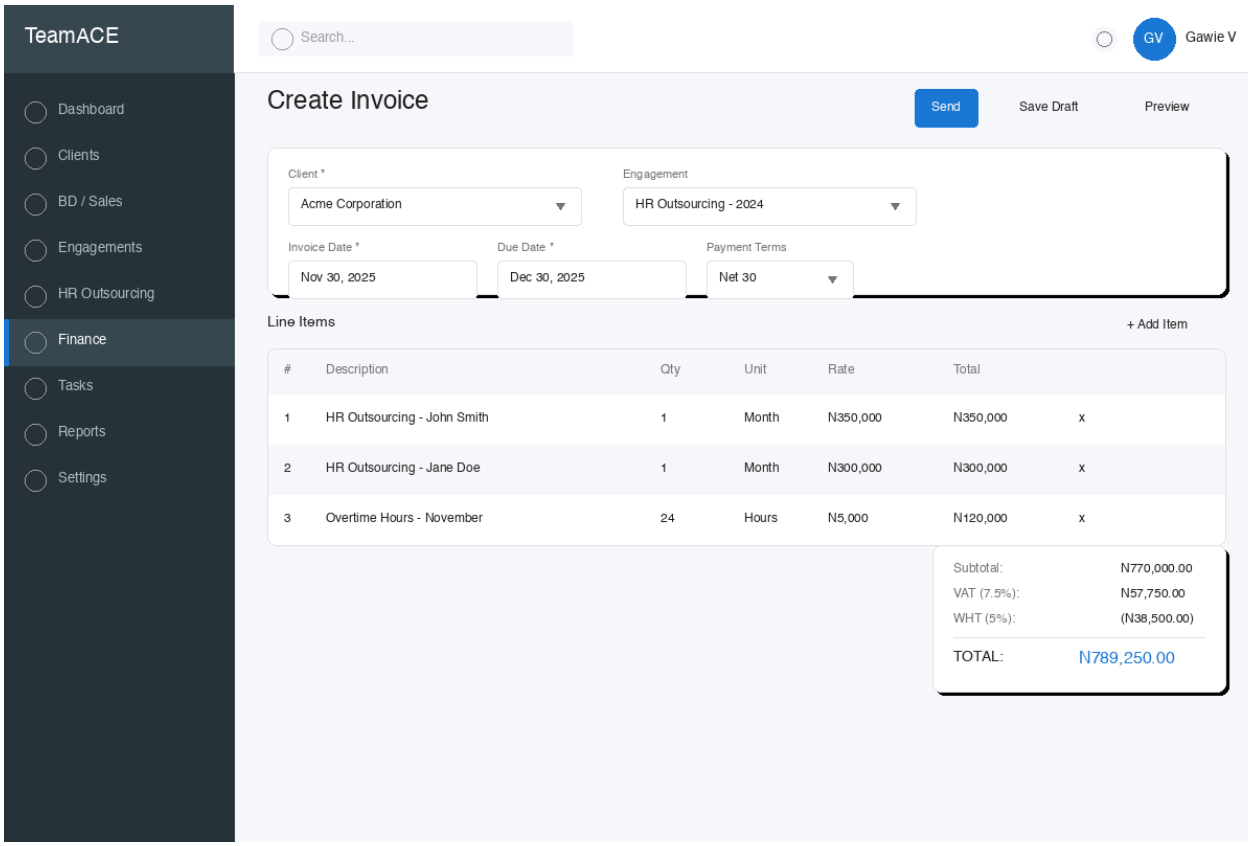

Figure 8: Invoice Create

D.6 Collaboration & Workflow Screens

D.6.1 Task List (My Tasks)

Personal task management with grouping by due date and related entity linking.

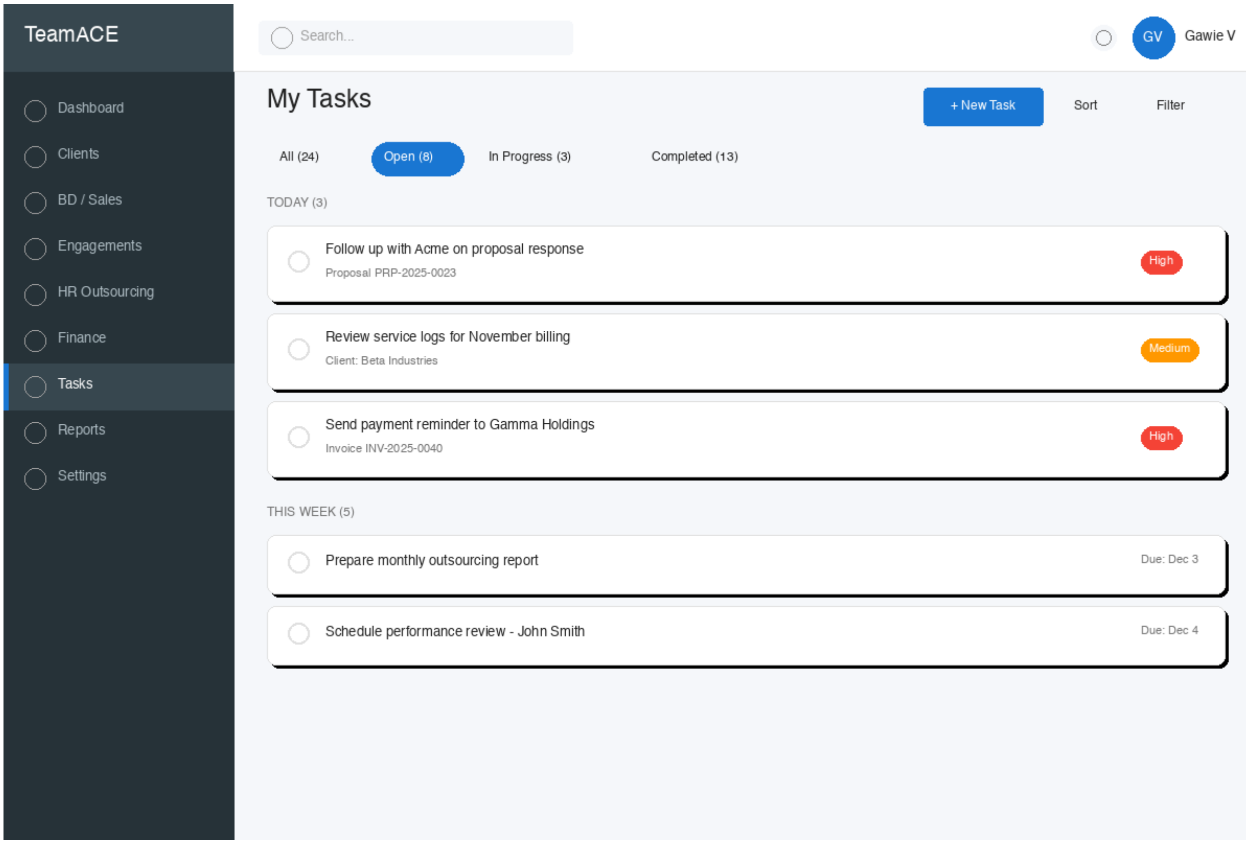

Figure 9: Task List

Features: - Tab filters (All, Open, In Progress, Completed) - Grouped by time period (Today, This Week, Later) - Priority indicators with color coding - Related entity links (client, invoice, proposal) - Quick complete/snooze actions

D.6.2 Approval Queue

Centralized approval interface for invoices, leave requests, expenses, and other workflows requiring authorization.

Card Components: - Approval type with icon - Summary of request with key details - Requester and timestamp - One-click Approve/Reject buttons - View Details link for full information

D.6.3 Notification Panel

Slide-out notification panel accessible from the header bell icon.

D.7 Dashboard Screen The dashboard provides an at-a-glance overview of key business metrics and pending items.

Dashboard Widgets: - **Quick Stats Cards**: Active Clients, Open Leads, Pipeline Value, Outstanding Receivables - **My Tasks**: Priority tasks due today with quick access to full task list - **Recent Activities**: System-wide activity feed - **Pipeline Summary**: Visual bar chart of pipeline stage distribution - **Receivables Aging**: Summary of aging buckets - **Upcoming Renewals**: Contracts expiring soon

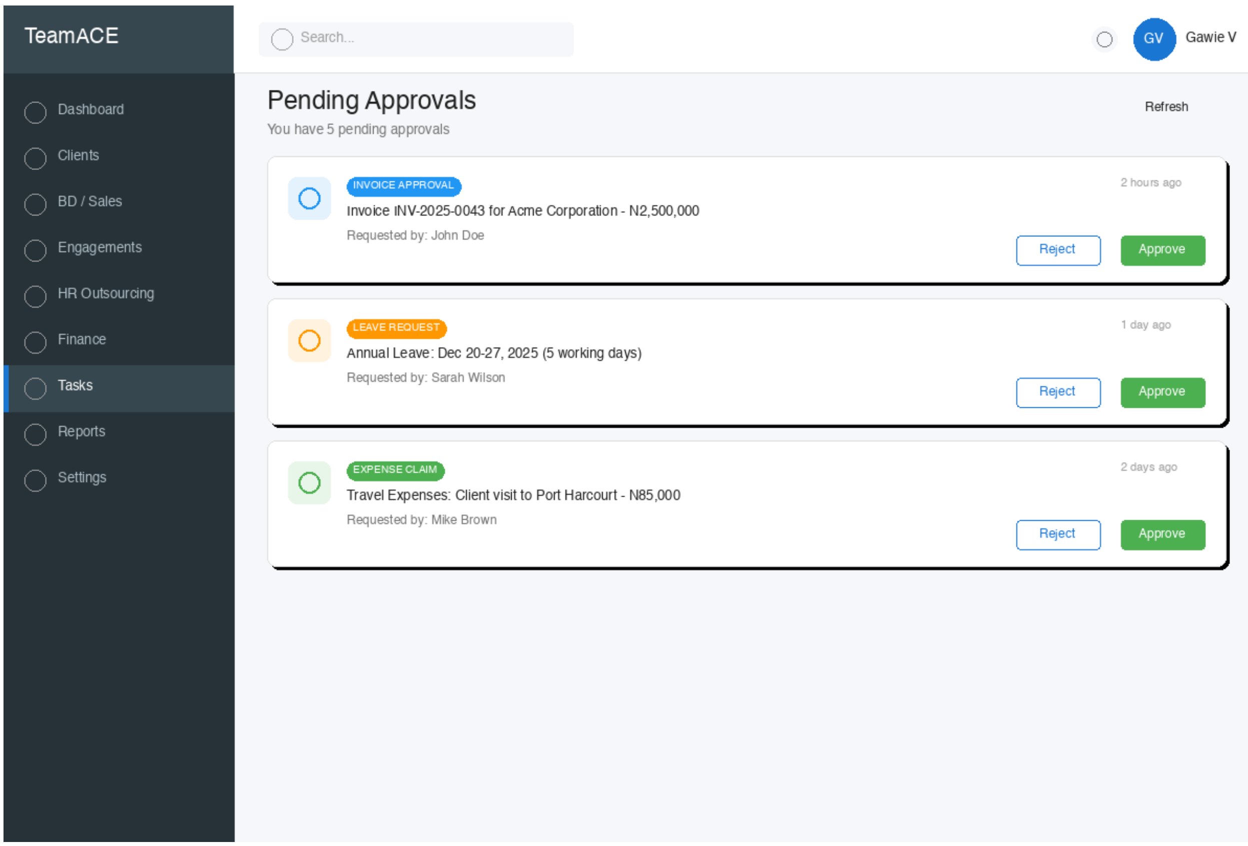

Figure 10: Approval Queue

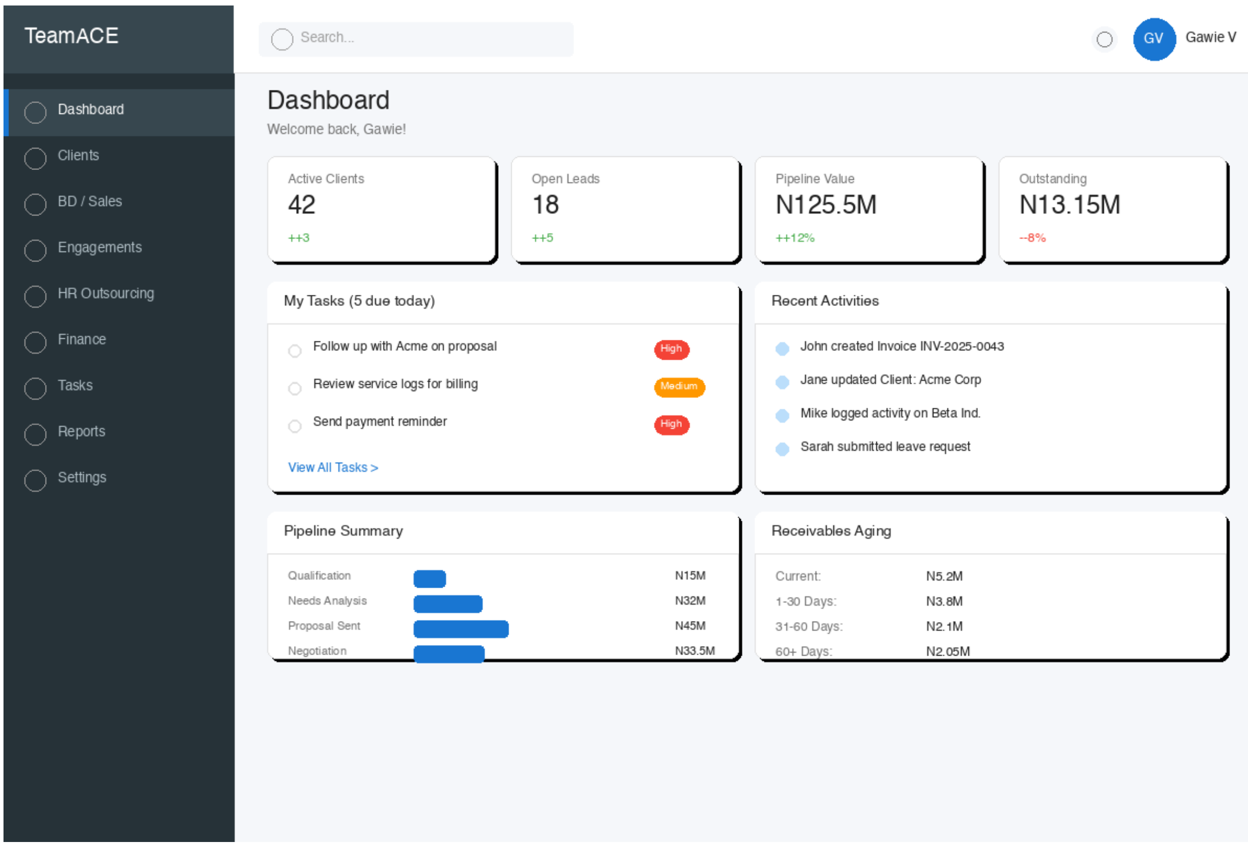

Figure 11: Dashboard

D.8 Mobile Responsive Views The system provides a fully responsive mobile experience optimized for field access.

Mobile Features: - **Hamburger Navigation**: Slide-out menu for all sections - **Card-Based Layouts**: Touch-friendly information cards - **Quick Actions**: Tap-to-call, tap-to-email buttons - **Optimized Forms**: Mobile-friendly input fields - **Offline Indicators**: Connection status awareness

Appendix E: API Response Formats

E.1 Success Response

```json
{
  "success": true,
  "data": {},
  "meta": {
    "page": 1,
    "limit": 20,
    "total": 150,
    "totalPages": 8
  }
}
```

E.2 Error Response

```json
{
  "success": false,
  "error": {
    "code": "VALIDATION_ERROR",
    "message": "Validation failed",
    "details": [
      {
        "field": "email",
        "message": "Invalid email format"
      }
    ]
  }
}
```

E.3 Standard HTTP Status Codes

Code	Usage
200	Success
201	Created
204	No Content (delete)
400	Bad Request (validation error)
401	Unauthorized
403	Forbidden
404	Not Found
409	Conflict (duplicate)
422	Unprocessable Entity
500	Internal Server Error

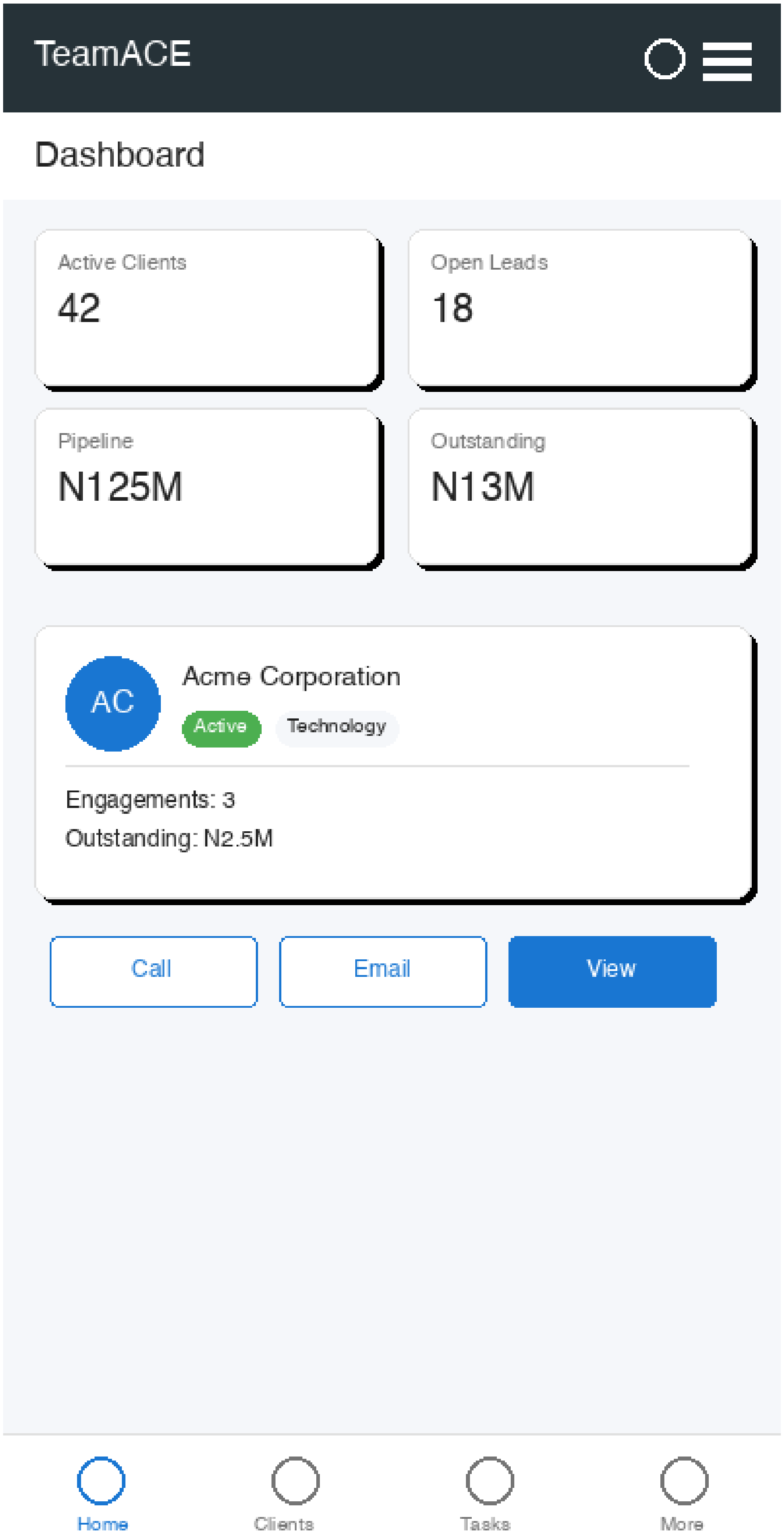

Figure 12: Mobile View

Document Approval

Role	Name	Date	Signature
Dev Lead	Gawie		
Partner Representative			
Technical Reviewer			

Document Version History

Version	Date	Author	Changes
1.0	2025-11-30	Rozitech	Initial draft

This document is confidential and intended for TeamACE and Rozitech use only.