

CONTRACT AND LICENSE MANAGEMENT SYSTEM (CLMS)

SYSTEM SPECIFICATIONS DOCUMENT

REVISION SHEET

Version	Date	Author	Changes
1.0	April 2026	IT Division, MIME	Initial Document

AUTHORIZATION MEMORANDUM

This System Specifications Document has been reviewed and approved for implementation.

Role	Name	Signature	Date
Project Manager			
IT Director			
Quality Assurance			

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1. PURPOSE OF THE DOCUMENT

This System Specifications Document provides a comprehensive functional specification for the Contract and License Management System (CLMS). It defines:

- Complete database structure and entity relationships
- Form field specifications mapped to database columns
- Graphical User Interface (GUI) components and layouts
- Data flow from user input to database storage
- Business rules and validation requirements
- System integration and notification specifications

This document serves as the foundation for:

- System development and implementation
- User manual and training materials
- Quality assurance and testing
- System maintenance and enhancement

2. APPLICATION BACKGROUND

2.1 Organization Context

The Ministry of Industrialization, Trade and SME Development (MITSMED) - formerly MIME - manages numerous contracts and software licenses that require systematic tracking to ensure timely renewals, compliance, and budget planning.

2.2 Business Need

The organization requires a centralized system to:

- Track contract and license expiry dates
- Send automated reminder notifications
- Manage payment records
- Generate reports for management decisions
- Maintain audit trails for compliance

2.3 Stakeholders

Stakeholder	Role in System
IT Division	System administrators, license management
Procurement Management Unit (PMU)	Contract management
Project Managers	Contract/License oversight
Heads of Department	Approval and oversight
Finance Division	Payment verification

3. CURRENT SYSTEM OVERVIEW

3.1 System Architecture

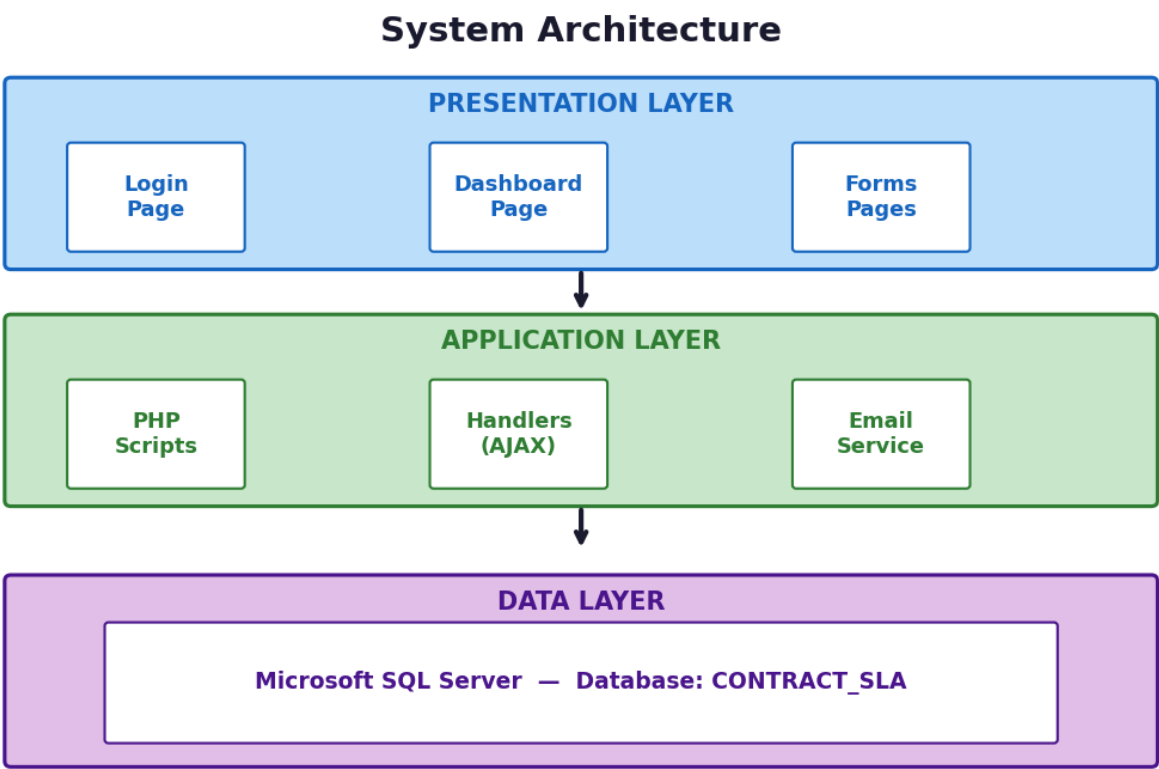


Figure: System Architecture — Three-Tier Model

3.2 Technology Stack

Component	Technology
Frontend	HTML5, CSS3, Bootstrap 5.3, JavaScript
Backend	PHP 7.4+
Database	Microsoft SQL Server 2008+
Web Server	Apache (XAMPP)
Email	PHPMailer with SMTP
Data Tables	DataTables.js

4. GOAL OF THE SYSTEM

To provide a comprehensive, user-friendly web-based system that enables effective management of contracts and licenses, ensuring timely notifications, accurate record-keeping, and compliance with organizational policies.

5. OBJECTIVES OF THE PROPOSED SYSTEM

ID	Objective	Description
OBJ-01	Centralized Management	Consolidate all contract and license information in a single accessible platform
OBJ-02	Automated Notifications	Send email reminders before contract/license expiry
OBJ-03	Payment Tracking	Track partial and full payments against contracts/licenses
OBJ-04	Audit Compliance	Maintain complete audit trail of all system activities
OBJ-05	Role-Based Access	Implement granular permissions based on user roles
OBJ-06	Reporting	Generate various reports for management decision-making
OBJ-07	Document Management	Store and retrieve supporting documents

6. OVERALL DESCRIPTION

6.1 System Modules

The CLMS consists of the following primary modules:

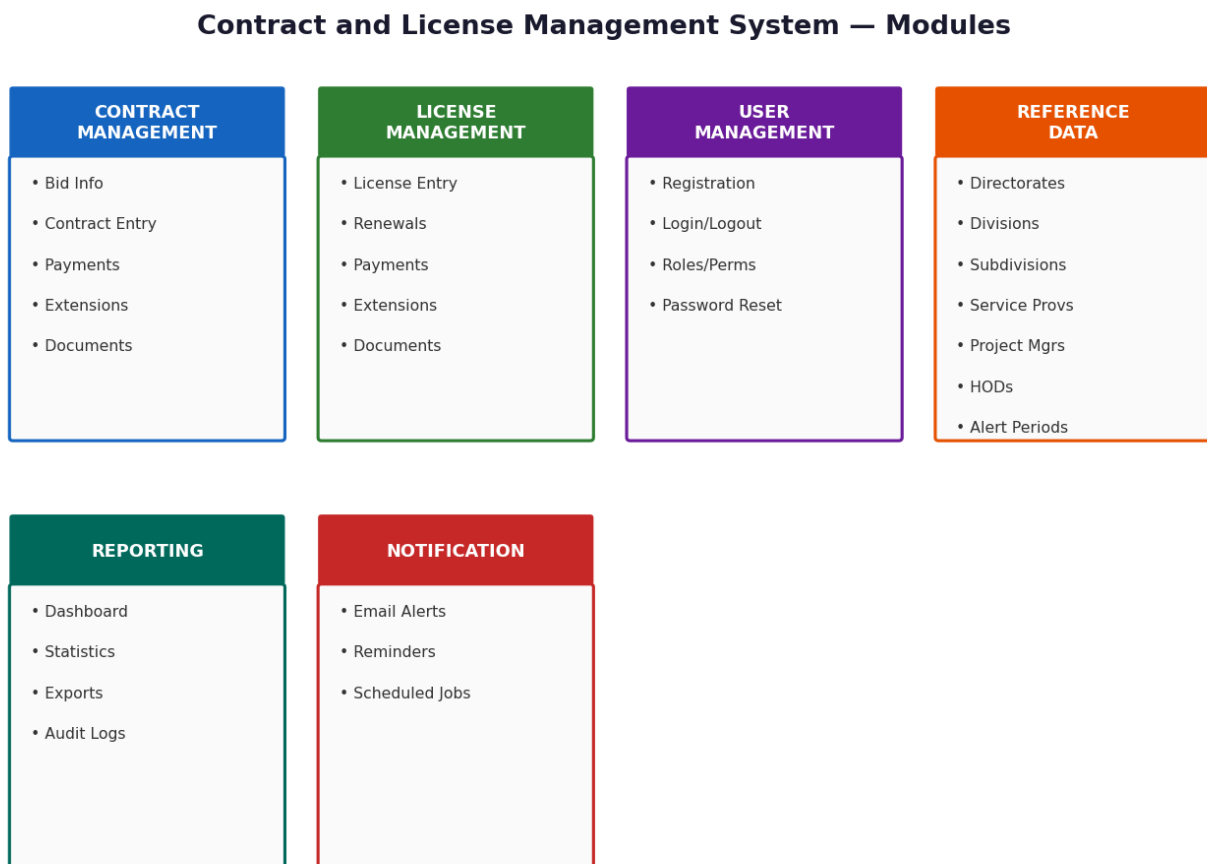


Figure: System Modules Overview

6.2 User Roles and Permissions

Role	Description	Permissions
Admin	Full system access	All modules, user management, reference data
Contract Manager	Manages contracts	Create, edit, delete contracts; view licenses
Contract Viewer	Read-only contract access	View contracts only
License Manager	Manages licenses	Create, edit, delete licenses; view contracts
License Viewer	Read-only license access	View licenses only

6.3 Data Flow Overview

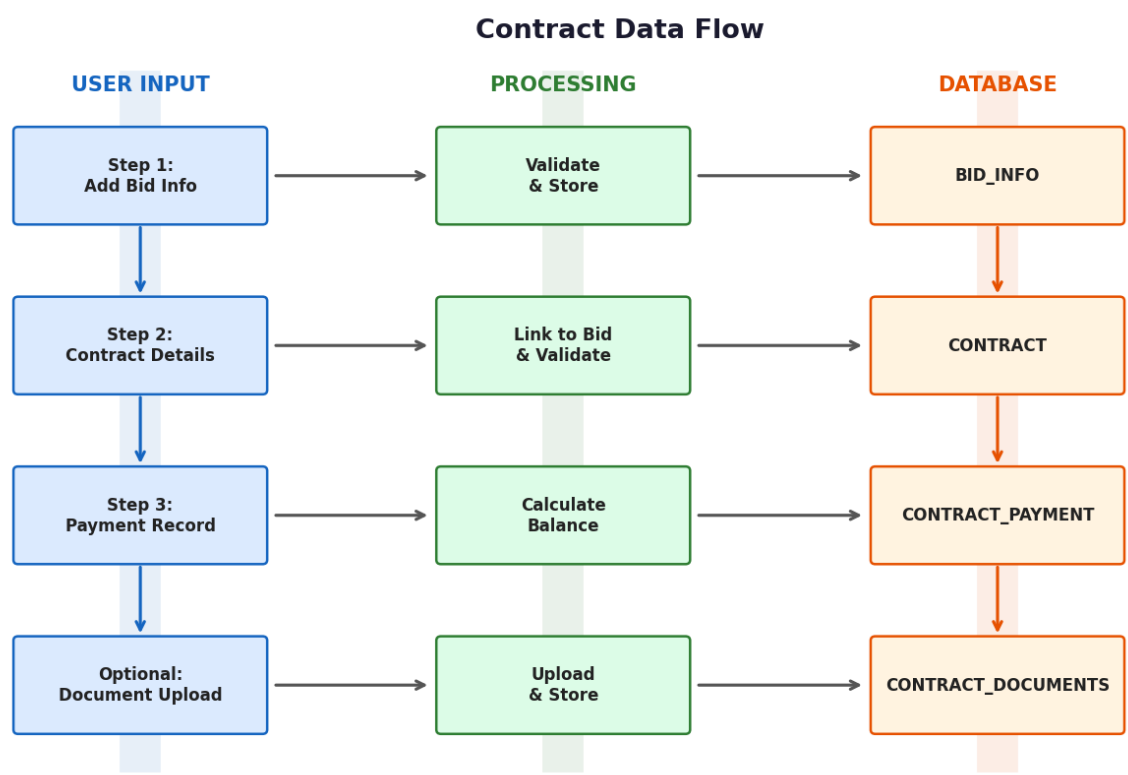


Figure: Contract Data Flow

7. FUNCTIONAL REQUIREMENTS

7.1 CONTRACT MANAGEMENT MODULE

7.1.1 Bid Information Entry

Purpose: Capture bid/tender information before contract creation.

Database Table: BID_INFO

Column Name	Data Type	Constraints	Form Field	GUI Element
ID	uniqueidentifier	PK, NOT NULL	Auto-generated	Hidden
bid_reference	varchar(50)	NOT NULL	Bid Reference *	Text Input (Pattern validated)
bid_description	nvarchar(max)	NOT NULL	Bid Description *	Textarea
bidder_name	varchar(150)	NOT NULL	Service Provider *	Dropdown (from SERVICE_PROVIDER)
FK_division_ID	uniqueidentifier	FK	Division *	Dropdown (from DIVISION)
FK_directorate_ID	uniqueidentifier	FK, NOT NULL	Directorate *	Dropdown (from DIRECTORATE)
FK_project_manager_ID	uniqueidentifier	FK, NOT NULL	Project Manager *	Dropdown (from PROJECT_MANAGER)
FK_subdivision_id	uniqueidentifier	FK, NULL	Subdivision	Dropdown (from SUBDIVISION)

Form Validation Rules:

Field	Rule	Error Message
Bid Reference	Format: `XX/XX/00-00/YYYY`	"Invalid Bid Reference format"
Bid Reference	Must be unique per service provider	"Duplicate Bid: A Bid with this reference exists"
Bid Description	Required, min 10 characters	"Description is required"
Directorate	Required selection	"Directorate is required"
Division	Required selection	"Division is required"
Project Manager	Required selection	"Project Manager is required"

GUI Layout - Bid Information Form:

ADD BID INFORMATION

Bid Reference *

SC/RP/15-03/2022

Bid Description *

Supply and delivery of IT equipment for the ministry...

Directorate *

Select Directorate ▼

Division *

Select Division ▼

Subdivision

Select Subdivision ▼

Project Manager *

Select Project Manager ▼ + Add New

Head of Department *

Select HOD ▼ + Add New

Service Provider *

Select Service Provider ▼ + Add New

Additional Email Recipients (Optional)

☐ John Doe (john.doe@mime.gov.na)
☒ Jane Smith (jane.smith@mime.gov.na)

Cancel

Save Bid Information

Figure: GUI — Add Bid Information Form

Data Flow - Bid Creation:

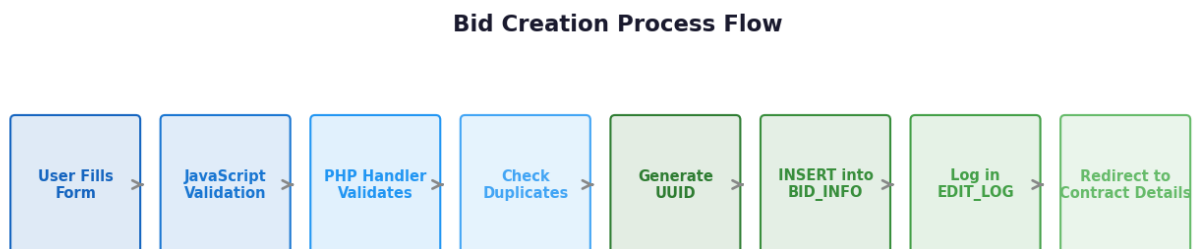


Figure: Bid Creation Process Flow

7.1.2 Contract Details Entry

Purpose: Capture contract details linked to an existing bid.

Database Table: CONTRACT

Column Name	Data Type	Constraints	Form Field	GUI Element
ID	uniqueidentifier	PK, NOT NULL	Auto-generated	Hidden
contract_amount	decimal(18,2)	NULL	Contract Amount *	Currency Input (N\$)
contract_period	varchar(50)	NOT NULL	Contract Period	Read-only (calculated)
start_date	varchar(50)	NOT NULL	Start Date *	Date Picker
end_date	varchar(50)	NOT NULL	End Date *	Date Picker
contract_status	varchar(50)	NOT NULL	Status	Default: "Active"
cession_agreement	varchar(50)	NOT NULL	Cession Agreement	Radio (Yes/No)
contract_type	varchar(50)	NOT NULL	Contract Type *	Dropdown
FK_bid_info_ID	uniqueidentifier	FK, NOT NULL	Linked Bid	From session
fk_alert_period_id	uniqueidentifier	FK, NULL	Alert Period *	Dropdown
FK_service_provider_id	uniqueidentifier	FK, NULL	Service Provider	From session
total_paid	decimal(18,2)	DEFAULT 0.00	Total Paid	Display only
outstanding_amount	decimal(18,2)	NULL	Outstanding	Calculated
payment_status	varchar(50)	DEFAULT 'Unpaid'	Payment Status	Display only
is_quotation_based	bit	NOT NULL, DEFAULT 0	Quotation Based	Checkbox

Contract Type Options:

Value	Display
Service	Service Contract
Supply	Supply Contract
Works	Works Contract
Consultancy	Consultancy Contract

Contract Status Options:

Value	Description
Active	Currently valid contract
Completed	Contract completed successfully
Cancelled	Contract cancelled
Deleted	Soft-deleted contract

GUI Layout - Contract Details Form:

FINAL STEP: CONTRACT DETAILS

Bid Reference:

SC/RP/15-03/2022

Directorate:

Information Technology

Service Provider:

ABC Company Ltd

CONTRACT INFORMATION SUMMARY (Read-only)

☐ Quotation Based — Amount unknown (to be determined later)

Contract Amount *

N\$ 500,000.00

Contract Type *

Select contract type

Start Date *

2026-04-01

End Date *

2027-03-31

Contract Period

12 months (calculated)

Cession Agreement

☐ No
 ☒ Yes

Alert Period *

☐ 1 Month Before
 ☐ 2 Months Before
 ☐ 3 Months Before
 ☐ 6 Months Before

SUPPORTING DOCUMENTS (Optional)

☐ Click to upload or drag files here | PDF, Word, Excel, Images (max 10MB)

← Back to Bids

Submit Contract

Figure: GUI — Contract Details Form

Business Rules:

Rule ID	Rule Description
CR-01	Contract period is auto-calculated: (End Date - Start Date) in months
CR-02	End date must be after start date
CR-03	If "Quotation Based" is checked, amount field is hidden and optional
CR-04	Multiple contracts for same bid must have matching dates and contract type
CR-05	Alert period determines when reminder emails are sent

7.1.3 Contract Payment Recording

Database Table: CONTRACT_PAYMENT

Column Name	Data Type	Constraints	Form Field	GUI Element
ID	uniqueidentifier	PK, NOT NULL	Auto-generated	Hidden
amount_paid	decimal(18,2)	NOT NULL	Payment Amount *	Currency Input

Column Name	Data Type	Constraints	Form Field	GUI Element
remaining_amount	decimal(18,2)	NOT NULL	Remaining Amount	Calculated
date_paid	date	NOT NULL	Payment Date *	Date Picker
FK_contract_ID	uniqueidentifier	FK, NOT NULL	Contract	From context
payment_method	varchar(50)	NULL	Payment Method	Dropdown

Payment Method Options:

Value	Display
Bank Transfer	Bank Transfer
EFT	Electronic Funds Transfer
Cheque	Cheque
Cash	Cash

GUI Layout - Payment Modal:

MAKE PAYMENT

Contract: SC/RP/15-03/2022 — ABC Company Ltd

Contract Amount:

N\$ 500,000.00

Total Paid:

N\$ 200,000.00

Outstanding:

N\$ 300,000.00

Payment Amount *

N\$

Maximum: N\$ 300,000.00

Payment Date *

2026-04-13 ▼

Payment Method

Select method ▼

Cancel

Record Payment

Figure: GUI — Make Payment Modal

Payment Status Calculation:

Condition	Payment Status
total_paid = 0	Unpaid
total_paid > 0 AND total_paid < contract_amount	Partially Paid
total_paid >= contract_amount	Fully Paid

7.1.4 Contract Extension

Database Table: CONTRACT_EXTENSION

Column Name	Data Type	Constraints	Form Field	GUI Element
ID	uniqueidentifier	PK, NOT NULL	Auto-generated	Hidden
start_ext_date	varchar(20)	NOT NULL	Extension Start *	Date Picker
end_ext_date	varchar(20)	NOT NULL	Extension End *	Date Picker
FK_contract_ID	uniqueidentifier	FK, NOT NULL	Contract	From context

GUI Layout - Extension Modal:

EXTEND CONTRACT

Current Contract Period: 2026-04-01 to 2027-03-31

Extension Start Date *

2027-04-01 ▼

Extension End Date *

2027-09-30 ▼

New Contract End Date:

2027-09-30

Extension Period:

6 months

Cancel

Extend Contract

Figure: GUI — Extend Contract Modal

7.1.5 Contract Documents

Database Table: CONTRACT_DOCUMENTS

Column Name	Data Type	Constraints	Form Field	GUI Element
ID	uniqueidentifier	PK, DEFAULT NEWID()	Auto-generated	Hidden
FK_contract_ID	uniqueidentifier	FK, NOT NULL	Contract	From context
file_name	nvarchar(255)	NOT NULL	-	System generated
original_name	nvarchar(255)	NOT NULL	File Name	Display
file_type	varchar(50)	NOT NULL	File Type	Display
file_size	int	NOT NULL	File Size	Display (formatted)
uploaded_by	uniqueidentifier	FK, NULL	Uploaded By	From session
uploaded_at	datetime	DEFAULT GETDATE()	Upload Date	Display
description	nvarchar(500)	NULL	Description	Text Input
document_type	varchar(20)	DEFAULT 'main'	Document Type	Dropdown

Allowed File Types:

Extension	MIME Type	Max Size
.pdf	application/pdf	10 MB
.doc, .docx	application/msword	10 MB
.xls, .xlsx	application/vnd.ms-excel	10 MB
.jpg, .jpeg, .png, .gif	image/*	10 MB

7.1.6 Contract Email Recipients

Database Table: CONTRACT_EMAIL_RECIPIENTS

Column Name	Data Type	Constraints	Description
ID	uniqueidentifier	PK, DEFAULT NEWID()	Unique identifier
FK_contract_ID	uniqueidentifier	FK, NOT NULL	Link to contract
recipient_name	varchar(150)	NOT NULL	Recipient full name
recipient_email	varchar(150)	NOT NULL	Recipient email address
created_at	datetime	DEFAULT GETDATE()	Record creation timestamp

7.2 LICENSE MANAGEMENT MODULE

7.2.1 License Entry

Database Table: LICENSE

Column Name	Data Type	Constraints	Form Field	GUI Element
ID	uniqueidentifier	PK, NOT NULL	Auto-generated	Hidden
name	varchar(150)	NOT NULL	License Name *	Text Input
license_type	varchar(25)	NOT NULL	License Type *	Dropdown
license_category	varchar(25)	NULL	Category	Dropdown
fk_service_provider	uniqueidentifier	FK, NOT NULL	Service Provider *	Dropdown
fk_project_manager_id	uniqueidentifier	FK, NULL	Project Manager	Dropdown

Column Name	Data Type	Constraints	Form Field	GUI Element
version	decimal(18,2)	NULL	Version	Text Input
quantity	int	NOT NULL	Quantity *	Number Input
license_amount	decimal(18,2)	NULL	License Amount	Currency Input
start_date	date	NOT NULL	Start Date *	Date Picker
expire_date	date	NOT NULL	Expiry Date *	Date Picker
license_status	varchar(25)	NOT NULL	Status	Default: "Active"
is_active	bit	NULL	Active	Checkbox
fk_alert_period_id2	uniqueidentifier	FK, NULL	Alert Period	Dropdown
total_paid	decimal(18,2)	DEFAULT 0.00	Total Paid	Display only
outstanding_amount	decimal(18,2)	NULL	Outstanding	Calculated
payment_status	varchar(50)	DEFAULT 'Unpaid'	Payment Status	Display only

License Type Options:

Value	Display
Software	Software License
Hardware	Hardware License
Cloud Service	Cloud Service
Maintenance	Maintenance Agreement
Support	Support Contract

License Category Options:

Value	Display
Enterprise	Enterprise Edition
Standard	Standard Edition
Professional	Professional Edition
Basic	Basic Edition
Premium	Premium Edition
Development	Development License
Production	Production License
Trial	Trial License
Educational	Educational License
Open Source	Open Source License

GUI Layout - License Entry Form:

ADD LICENSE

License Name *

Microsoft Office 365

License Type *

Software

Category

Enterprise

Version

16.0

Quantity *

50

License Amount

N\$ 75,000.00

Start Date *

2026-04-01

Expiry Date *

2027-03-31

Service Provider *

Select provider

+ Add New

Project Manager

Select manager

+ Add New

Alert Period

Select alert period

Directorate

Select Directorate

Division

Select Division

Cancel

Submit License

Figure: GUI — Add License Form

7.2.2 License Payment Recording

Database Table: LICENSE_PAYMENT

Column Name	Data Type	Constraints	Form Field	GUI Element
ID	uniqueidentifier	PK, DEFAULT NEWID()	Auto-generated	Hidden
amount_paid	decimal(18,2)	NOT NULL	Payment Amount *	Currency Input
remaining_amount	decimal(18,2)	NULL	Remaining	Calculated
date_paid	datetime	NOT NULL	Payment Date *	Date Picker
FK_license_ID	uniqueidentifier	FK, NOT NULL	License	From context
payment_method	varchar(50)	NULL	Payment Method	Dropdown

7.2.3 License Extension

Database Table: LICENSE_EXTENSION

Column Name	Data Type	Constraints	Form Field	GUI Element
ID	uniqueidentifier	PK, NOT NULL	Auto-generated	Hidden
start_ext_date	date	NULL	Extension Start	Date Picker
end_ext_date	date	NULL	Extension End	Date Picker
FK_license_ID	uniqueidentifier	FK, NULL	License	From context

7.2.4 License Documents

Database Table: LICENSE_DOCUMENTS

Column Name	Data Type	Constraints	Form Field	GUI Element
ID	uniqueidentifier	PK, DEFAULT NEWID()	Auto-generated	Hidden
FK_license_ID	uniqueidentifier	FK, NOT NULL	License	From context
file_name	nvarchar(255)	NOT NULL	-	System generated
original_name	nvarchar(255)	NOT NULL	File Name	Display
file_type	varchar(50)	NOT NULL	File Type	Display
file_size	int	NOT NULL	File Size	Display
uploaded_by	uniqueidentifier	FK, NULL	Uploaded By	From session
uploaded_at	datetime	DEFAULT GETDATE()	Upload Date	Display
description	nvarchar(500)	NULL	Description	Text Input
document_type	varchar(20)	DEFAULT 'main'	Type	Dropdown

7.3 REFERENCE DATA MODULE

7.3.1 Directorate Management

Database Table: DIRECTORATE

Column Name	Data Type	Constraints	Form Field	GUI Element
ID	uniqueidentifier	PK, DEFAULT NEWID()	Auto-generated	Hidden
name_directorate	varchar(50)	NOT NULL	Directorate Name *	Text Input

7.3.2 Division Management

Database Table: DIVISION

Column Name	Data Type	Constraints	Form Field	GUI Element
ID	uniqueidentifier	PK, DEFAULT NEWID()	Auto-generated	Hidden
division_name	varchar(50)	NOT NULL	Division Name *	Text Input
fk_directorate_id	uniqueidentifier	FK, NOT NULL	Directorate *	Dropdown

7.3.3 Subdivision Management

Database Table: SUBDIVISION

Column Name	Data Type	Constraints	Form Field	GUI Element
ID	uniqueidentifier	PK, NOT NULL	Auto-generated	Hidden
subdivision_name	varchar(100)	NOT NULL	Subdivision Name *	Text Input
fk_division_id	uniqueidentifier	FK, NOT NULL	Division *	Dropdown

7.3.4 Service Provider Management

Database Table: SERVICE_PROVIDER

Column Name	Data Type	Constraints	Form Field	GUI Element
ID	uniqueidentifier	PK, NOT NULL	Auto-generated	Hidden
name_of_supplier	varchar(150)	NOT NULL	Supplier Name *	Text Input
physical_address	varchar(255)	NOT NULL	Physical Address *	Textarea
postal_address	varchar(255)	NULL	Postal Address	Textarea
tel_work	varchar(50)	NOT NULL	Telephone *	Tel Input
website	varchar(255)	NULL	Website	URL Input
email_address	varchar(150)	NOT NULL	Email *	Email Input
contact_person	varchar(150)	NULL	Contact Person	Text Input
fk_division_id	uniqueidentifier	FK, NULL	Division	Dropdown
FK_subdivision_id	uniqueidentifier	FK, NULL	Subdivision	Dropdown

GUI Layout - Service Provider Form:

ADD SERVICE PROVIDER

Supplier Name *

ABC Technology Solutions (Pty) Ltd

Physical Address *

123 Independence Avenue
Windhoek, Namibia

Postal Address

P.O. Box 12345, Windhoek ▼

Telephone *

+264 61 123 4567 ▼

Email *

info@abctech.com.na ▼

Website

https://www.abctech.com.na ▼

Contact Person

John Smith

Cancel

Save Service Provider

Figure: GUI — Add Service Provider Form

7.3.5 Project Manager Management

Database Table: PROJECT_MANAGER

Column Name	Data Type	Constraints	Form Field	GUI Element
ID	uniqueidentifier	PK, NOT NULL	Auto-generated	Hidden
manager_name	varchar(50)	NOT NULL	Manager Name *	Text Input
manager_email	varchar(50)	NOT NULL	Email *	Email Input (@mime.gov.na)
manager_tel	varchar(50)	NOT NULL	Telephone *	Tel Input
FK_division_id	uniqueidentifier	FK, NULL	Division	Dropdown
FK_directorate_id	uniqueidentifier	FK, NULL	Directorate	Dropdown
FK_subdivision_id	uniqueidentifier	FK, NULL	Subdivision	Dropdown
FK_bidinfo_ID	uniqueidentifier	FK, NULL	Bid (Legacy)	Hidden

Validation Rule: Email must end with @mime.gov.na

7.3.6 Head of Department Management

Database Table: HEAD_OF_DEPARTMENT

Column Name	Data Type	Constraints	Form Field	GUI Element
ID	uniqueidentifier	PK, NOT NULL	Auto-generated	Hidden
head_name	varchar(150)	NOT NULL	HOD Name *	Text Input
head_email	varchar(150)	NOT NULL, UNIQUE	Email *	Email Input
head_tel	varchar(50)	NOT NULL	Telephone *	Tel Input
FK_division_id	uniqueidentifier	FK, NOT NULL	Division *	Dropdown
FK_directorate_id	uniqueidentifier	FK, NULL	Directorate	Dropdown
FK_subdivision_id	uniqueidentifier	FK, NULL	Subdivision	Dropdown
FK_bidinfo_ID	uniqueidentifier	FK, NULL	Bid (Legacy)	Hidden

7.3.7 Alert Period Configuration

Database Table: ALERT_PERIOD

Column Name	Data Type	Constraints	Form Field	GUI Element
id	uniqueidentifier	PK, DEFAULT NEWID()	Auto-generated	Hidden
months	int	NOT NULL	Months Before Expiry *	Number Input
period_label	nvarchar(50)	NOT NULL	Label *	Text Input

Pre-configured Values:

Months	Label
1	1 Month Before
2	2 Months Before
3	3 Months Before
6	6 Months Before
12	12 Months Before

7.3.8 Additional Email Recipients

Database Table: ADDITIONAL_RECIPIENTS

Column Name	Data Type	Constraints	Form Field	GUI Element
ID	uniqueidentifier	PK, NOT NULL	Auto-generated	Hidden
recipient_name	varchar(100)	NOT NULL	Name *	Text Input
recipient_email	varchar(150)	NOT NULL	Email *	Email Input
recipient_tel	varchar(50)	NULL	Telephone	Tel Input
created_date	datetime	DEFAULT GETDATE()	Created	Display only
FK_directorate_id	uniqueidentifier	FK, NULL	Directorate	Dropdown

7.4 NOTIFICATION MODULE

7.4.1 Email Notification System

Notification Triggers:

Trigger	Recipients	Template
Contract Created	CLMS Group, PM, HOD, Additional Recipients	contract_created
License Created	CLMS Group, PM, Additional Recipients	license_created
Contract Expiring	PM, HOD, Additional Recipients	contract_reminder
License Expiring	PM, Additional Recipients	license_reminder
Payment Recorded	PM, HOD	payment_recorded

Notification Data Flow:

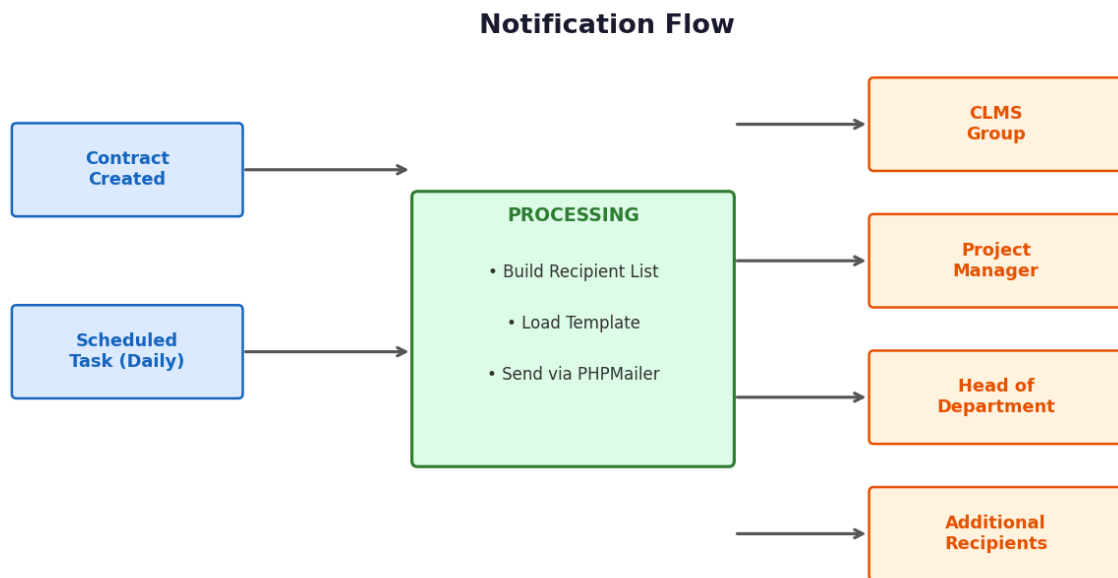


Figure: Notification Flow

7.5 AUDIT LOG MODULE

Database Table: EDIT_LOG

Column Name	Data Type	Constraints	Description
rowguid	uniqueidentifier	PK, DEFAULT NEWID()	Unique log entry ID
datecreated	varchar(50)	NOT NULL	Timestamp of action
machine	varchar(50)	NOT NULL	Machine name
ipaddress	varchar(50)	NOT NULL	IP address
usercreated	varchar(50)	NOT NULL	User ID who performed action

Column Name	Data Type	Constraints	Description
action	varchar(50)	NOT NULL	Action type code
entity_type	varchar(50)	NULL	Entity affected (CONTRACT, LICENSE, etc.)
entity_id	uniqueidentifier	NULL	ID of affected entity
old_value	varchar(max)	NULL	Previous value (JSON)
new_value	varchar(max)	NULL	New value (JSON)
description	varchar(500)	NULL	Human-readable description
payment_amount	decimal(18,2)	NULL	For payment actions
status_from	varchar(50)	NULL	Previous status
status_to	varchar(50)	NULL	New status

Action Types:

Action Code	Description
LOGIN_SUCCESS	Successful user login
LOGIN_FAILED	Failed login attempt
CREATE_CONTRACT	New contract created
EDIT_CONTRACT	Contract modified
DELETE_CONTRACT	Contract deleted
RESTORE_CONTRACT	Contract restored
EXTEND_CONTRACT	Contract extended
CHANGE_CONTRACT_STATUS	Contract status changed
CREATE_LICENSE	New license created
EDIT_LICENSE	License modified
DELETE_LICENSE	License deleted
RESTORE_LICENSE	License restored
UPDATE_LICENSE	License updated
CHANGE_LICENSE_STATUS	License status changed
PAYMENT_RECORDED	Payment recorded
CREATE_PM	Project Manager created
UPDATE_PM	Project Manager updated
DELETE_PM	Project Manager deleted
CREATE_SP	Service Provider created
UPDATE_SP	Service Provider updated
DELETE_SP	Service Provider deleted
CREATE_BID	Bid information created
UPDATE_BID	Bid information updated

8. USER MANAGEMENT MODULE

8.1 User Registration

Database Table: USERS

Column Name	Data Type	Constraints	Form Field	GUI Element
id	uniqueidentifier	PK, DEFAULT NEWID()	Auto-generated	Hidden
username	nvarchar(50)	NOT NULL, UNIQUE	Username *	Text Input
first_name	nvarchar(50)	NULL	First Name *	Text Input
last_name	nvarchar(50)	NULL	Last Name *	Text Input
email	nvarchar(100)	NOT NULL, UNIQUE	Email *	Email Input
password_hash	nvarchar(60)	NOT NULL	Password *	Password Input (hashed)
is_active	bit	DEFAULT 1	Active	Checkbox
avatar_path	nvarchar(400)	NULL	Avatar	File Upload
fk_division_id	uniqueidentifier	FK, NULL	Division	Dropdown

Username Validation Rules:

Rule	Requirement
Length	3-30 characters
Format	Start with letter, alphanumeric + dots, underscores, hyphens
Reserved	Cannot use: admin, administrator, system, root, test, demo
Unique	Must be unique in system

GUI Layout - Registration Form:

USER REGISTRATION

First Name *

John

Last Name *

Doe

Username *

john.doe

✓ Available

Email *

john.doe@mime.gov.na

Division *

Select Division

Role(s) *

☐ Admin
☒ **Contract Manager**
☐ Contract Viewer
☐ License Manager
☐ License Viewer

Directorate

Select Directorate

A temporary password will be emailed to the user upon registration.

Cancel

Register User

Figure: GUI — User Registration Form

Registration Flow:

1. Admin fills registration form
2. System validates all fields
3. Generates temporary password
4. Creates user record (inactive)
5. Sends registration email with temporary password
6. User clicks activation link
7. User sets new password
8. Account activated

8.2 User Authentication

Database Table: LOGIN_ATTEMPTS

Column Name	Data Type	Constraints	Description
ID	uniqueidentifier	PK, DEFAULT NEWID()	Attempt ID
username	nvarchar(100)	NOT NULL	Username attempted
attempt_time	datetime	DEFAULT GETDATE()	When attempt occurred

Column Name	Data Type	Constraints	Description
ip_address	nvarchar(45)	NULL	Client IP address
user_agent	nvarchar(25)	NULL	Browser user agent
was_successful	bit	NOT NULL	Success/failure flag

GUI Layout - Login Form:

CLMS

Contract & License Management

Ministry of Industrialization, Trade and SME Development

Username

Enter your username

Password

Enter your password

☐ Remember me

LOGIN

Forgot your password?

Contact your system administrator if you need assistance.

CLMS v1.0 | IT Division — MIME

Figure: GUI — Login Form

8.3 Password Reset

Database Table: password_reset_tokens

Column Name	Data Type	Constraints	Description
id	uniqueidentifier	PK, DEFAULT NEWID()	Token ID
user_id	uniqueidentifier	FK, NOT NULL	User requesting reset
token	varchar(255)	NOT NULL	Reset token
token_hash	varchar(255)	NOT NULL	Hashed token
expires_at	datetime	NOT NULL	Token expiry time

Column Name	Data Type	Constraints	Description
created_at	datetime	DEFAULT GETDATE()	Token creation time
used_at	datetime	NULL	When token was used
ip_address	varchar(45)	NULL	Requester IP
is_first_time	bit	DEFAULT 0	First-time password set

8.4 Role and Permission Management

Database Table: ROLES

Column Name	Data Type	Constraints	Description
id	uniqueidentifier	PK, DEFAULT NEWID()	Role ID
name	nvarchar(50)	NOT NULL, UNIQUE	Role name
description	nvarchar(255)	NULL	Role description

Pre-defined Roles:

Role Name	Description
Admin	Full system access
Contract Manager	Manage contracts
Contract Viewer	View contracts only
License Manager	Manage licenses
License Viewer	View licenses only

Database Table: PERMISSIONS

Column Name	Data Type	Constraints	Description
ID	uniqueidentifier	PK, DEFAULT NEWID()	Permission ID
name	nvarchar(100)	NOT NULL, UNIQUE	Permission name
description	nvarchar(255)	NOT NULL	Permission description

Database Table: ROLE_PERMISSIONS

Column Name	Data Type	Constraints	Description
ID	uniqueidentifier	PK, DEFAULT NEWID()	Link ID
FK_role_id	uniqueidentifier	FK, NOT NULL	Role reference
FK_permission_id	uniqueidentifier	FK, NOT NULL	Permission reference

Database Table: USER_ROLES

Column Name	Data Type	Constraints	Description
ID	uniqueidentifier	PK, NOT NULL	Link ID
FK_user_id	uniqueidentifier	FK, NOT NULL	User reference
FK_role_id	uniqueidentifier	FK, NOT NULL	Role reference

Database Table: USER_PERMISSIONS

Column Name	Data Type	Constraints	Description
user_id	uniqueidentifier	PK, FK	User reference
permission_id	uniqueidentifier	PK, FK	Permission reference
assigned_at	datetime2(0)	DEFAULT SYSUTCDATETIME()	Assignment timestamp

9. REPORT MODULE

9.1 Dashboard Statistics

The system provides real-time dashboard statistics:

Statistic	Description	SQL Source
Contracts Expiring (30 days)	Active contracts expiring within 30 days	CONTRACT table
Contracts Expiring (60 days)	Active contracts expiring within 60 days	CONTRACT table
Contracts Expiring (90 days)	Active contracts expiring within 90 days	CONTRACT table
Expired Contracts	Active contracts past end date	CONTRACT table
Licenses Expiring (30 days)	Active licenses expiring within 30 days	LICENSE table
Licenses Expiring (60 days)	Active licenses expiring within 60 days	LICENSE table
Licenses Expiring (90 days)	Active licenses expiring within 90 days	LICENSE table
Expired Licenses	Active licenses past expiry date	LICENSE table

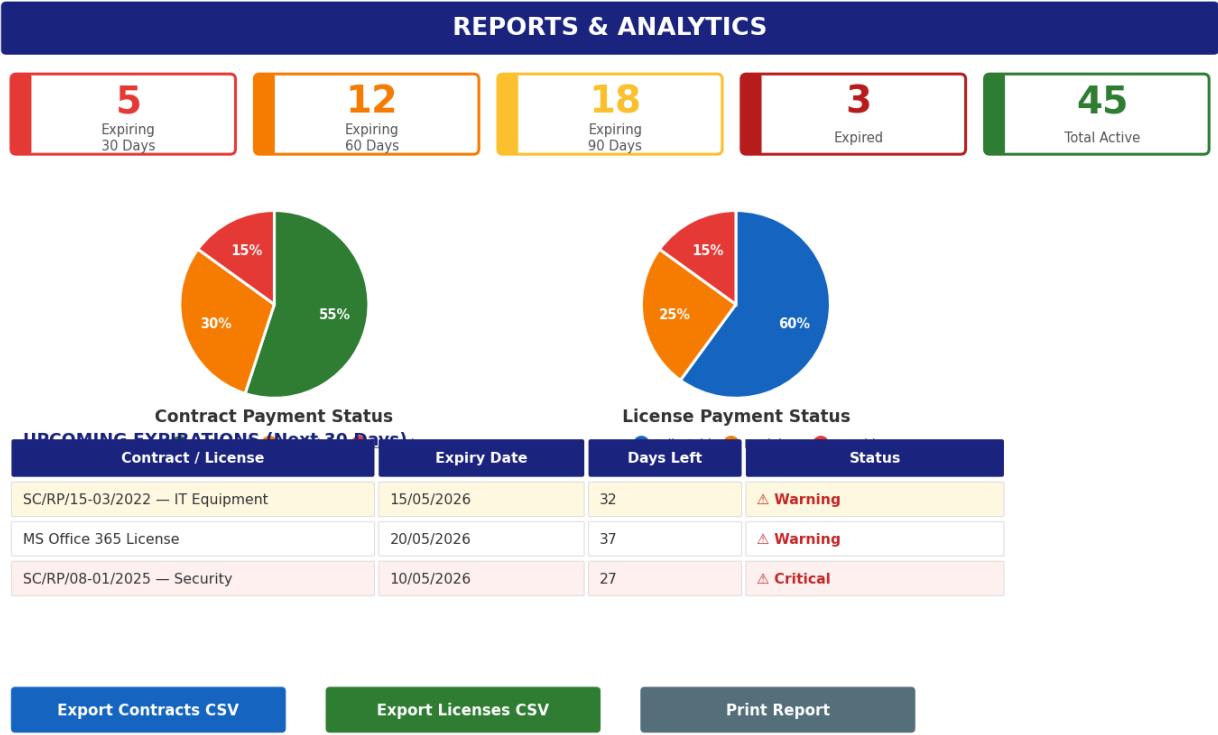
9.2 Payment Reports

Report	Description
Contract Payment Status	Fully paid, partially paid, unpaid contracts
License Payment Status	Fully paid, partially paid, unpaid licenses
Outstanding Amounts	Total outstanding by contract/license
Payment History	Chronological payment records

9.3 Management Reports

Report	Filters	Export Formats
Contracts by Status	Status, Date Range, Directorate	PDF, Excel, CSV
Contracts by Directorate	Directorate, Division	PDF, Excel, CSV
Licenses by Type	License Type, Status	PDF, Excel, CSV
Expiry Calendar	Date Range	PDF, Calendar
Audit Trail	Action Type, User, Date Range	PDF, Excel

9.4 GUI Layout - Reports Page



ID	Requirement	Implementation
NFR-11	Access control	Role-based permissions
NFR-12	Audit logging	All data modifications logged

10.3 Availability Requirements

ID	Requirement	Target
NFR-13	System uptime	99.5% during business hours
NFR-14	Scheduled maintenance window	Weekends, after hours
NFR-15	Database backup	Daily automated backup

10.4 Compatibility Requirements

ID	Requirement	Specification
NFR-16	Browser support	Chrome 90+, Firefox 88+, Edge 90+
NFR-17	Mobile responsiveness	Bootstrap 5 responsive design
NFR-18	Database compatibility	SQL Server 2008 R2+

11. INTERFACE SPECIFICATIONS

11.1 External Interfaces

Interface	Protocol	Purpose
SMTP Email Server	SMTP/TLS	Send notification emails
Database Server	ODBC	Data storage and retrieval

11.2 User Interface Standards

Color Scheme:

Element	Color	Hex Code
Primary	Blue	#0d6efd
Success	Green	#198754
Warning	Yellow	#ffc107
Danger	Red	#dc3545
Info	Cyan	#0dcaf0
Light	Light Gray	#f8f9fa
Dark	Dark Gray	#212529

Typography:

Element	Font	Size
Headings	System UI	h1: 2rem, h2: 1.75rem, h3: 1.5rem
Body Text	System UI	1rem (16px)
Small Text	System UI	0.875rem
Form Labels	System UI	1rem, Bold

Layout Grid:

Screen Size	Columns	Container Width
Large (>1200px)	12	1140px
Medium (768-1199px)	12	720-960px
Small (<768px)	12	100%

12. SOFTWARE USABILITY REQUIREMENTS

12.1 Accessibility

ID	Requirement
USR-01	Keyboard navigation support for all interactive elements
USR-02	ARIA labels for screen reader compatibility
USR-03	Sufficient color contrast ratios (WCAG 2.1 AA)
USR-04	Form field focus indicators
USR-05	Error messages clearly associated with fields

12.2 User Experience

ID	Requirement
USR-06	Confirmation dialogs for destructive actions
USR-07	Loading indicators for async operations
USR-08	Form validation with inline error messages
USR-09	Breadcrumb navigation
USR-10	Consistent button placement and styling

13. DELIVERABLES

Deliverable	Description	Format
Source Code	Complete PHP application source	PHP/HTML/CSS/JS files
Database Scripts	SQL scripts for database setup	.sql files
System Specifications	This document	PDF/Word
User Manual	End-user guide with screenshots	PDF/Word

Deliverable	Description	Format
Developer Manual	Technical documentation	PDF/Word
Test Cases	Testing documentation	Excel/PDF
Deployment Guide	Installation instructions	PDF/Word

14. SOFTWARE TESTING

14.1 Testing Types

Test Type	Description	Tools
Unit Testing	Individual function testing	Manual/PHP Unit
Integration Testing	Module interaction testing	Manual
User Acceptance Testing	End-user validation	Test scenarios
Security Testing	Vulnerability assessment	Manual/OWASP tools
Performance Testing	Load and stress testing	Manual/Load testing tools

14.2 Test Cases Summary

Module	Test Cases	Priority
User Authentication	Login, Logout, Password Reset	Critical
Contract Management	CRUD operations, Payments, Extensions	Critical
License Management	CRUD operations, Payments, Renewals	Critical
Notifications	Email delivery, Templates	High
Reports	Data accuracy, Export functionality	Medium
Reference Data	CRUD operations	Medium

15. MAINTENANCE

15.1 Routine Maintenance

Task	Frequency	Responsibility
Database backup	Daily (automated)	System Administrator
Log file rotation	Weekly	System Administrator
Security patch review	Monthly	IT Security
Performance monitoring	Ongoing	System Administrator

15.2 Support Levels

Level	Response Time	Description
Critical	2 hours	System down, data loss risk
High	4 hours	Major functionality impaired
Medium	1 business day	Minor functionality issues
Low	3 business days	Enhancement requests

16. TERMS AND CONDITIONS

16.1 Confidentiality

All data within the system is confidential and shall only be accessed by authorized personnel.

16.2 Data Retention

- Active records: Retained indefinitely
- Deleted records: Soft-deleted, retained for 7 years
- Audit logs: Retained for 5 years

16.3 Compliance

The system complies with:

- Government ICT policies
- Data protection regulations
- Financial audit requirements

17. ABBREVIATIONS/ACRONYMS

Abbreviation	Full Form
CLMS	Contract and License Management System
CRUD	Create, Read, Update, Delete
CSRF	Cross-Site Request Forgery
FK	Foreign Key
GUI	Graphical User Interface
HOD	Head of Department
MIME	Ministry of Industrialization and Technology
ODBC	Open Database Connectivity
PK	Primary Key
PM	Project Manager
PMU	Procurement Management Unit
SMTP	Simple Mail Transfer Protocol
SQL	Structured Query Language
UUID	Universally Unique Identifier
XSS	Cross-Site Scripting

18. APPENDIX

Appendix A: Database Entity Relationship Diagram

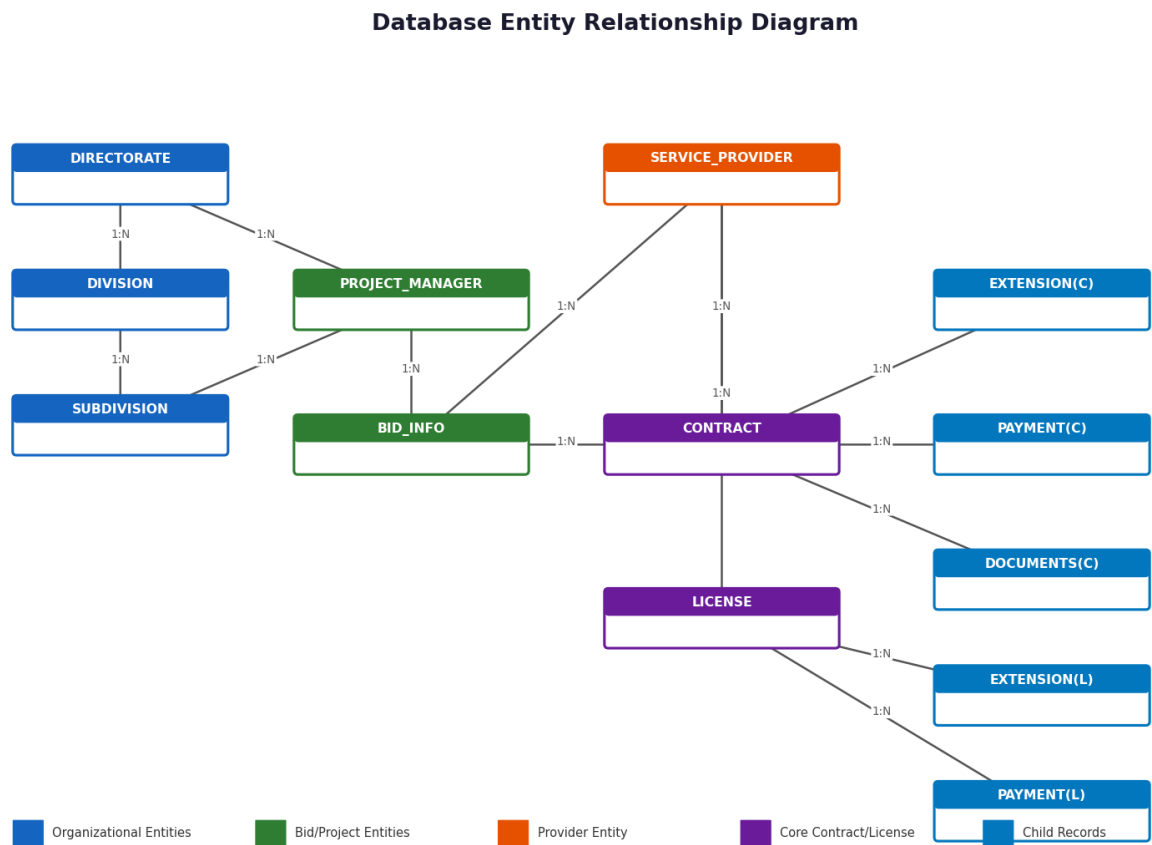


Figure: Database Entity Relationship Diagram

Appendix B: System File Structure

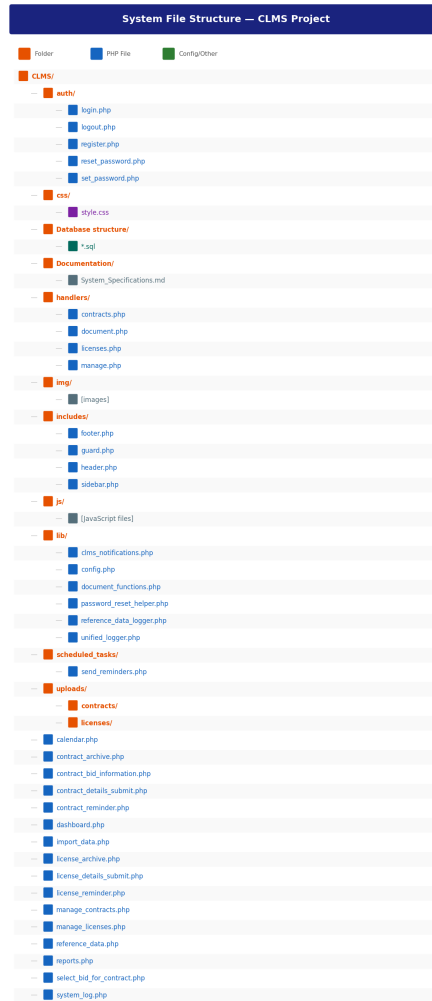


Figure: System File Structure

Appendix C: Contact Information

Role	Contact
System Administrator	IT Division, MIME
Technical Support	it.support@mime.gov.na
Project Manager	[Project Manager Name]

Document End

This System Specifications Document is maintained by the IT Division and should be updated whenever significant system changes are implemented.