# Physical Data Design for Licensing Self-Certification Portal (LSCP)

**Version 0.1**

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? The Government of the Hong Kong Special Administrative Region

## 1. Introduction

This document details the physical data design for the Licensing Self-Certification Portal (LSCP) project. It outlines the database structure, including tables, columns, data types, keys, and relationships. This serves as a guide for developers and database administrators during implementation and maintenance.

## 2. Objectives

The LSCP aims to:

1. Provide user-friendly and meaningful messages to users.
2. Store electronic and paper submissions, including safety certificates from applicants, authorized persons (AP), and registered structural engineers (RSE).
3. Enable BD departmental portal login for internal users, supporting User ID/Password authentication.
4. Support modern web browsers.
5. Comply with government system architecture and IT security policies.

## 3. Physical Data Structure Specification

### 3.1. Physical Data Structure

The system utilizes a relational database structure. The following entity-relationship diagram illustrates the relationships between key entities:

(Diagram of entities and relationships would be inserted here. Since I cannot generate images, a textual representation will be provided below.)  
  
Entities: ApplicationCases, SchoolApp\_Infos, SchoolApp\_Submissions, ApplicationFiles, LSCPMasterTable, GenOtp, AdrBlk, SYS\_META\_DATA, Aprse, Users, Tasks, Cases, Eminutes, OAuthTokens, Attachments, SysFileRefs, AdrBlkFileRefs  
  
Relationships (Examples):  
- SchoolApp\_Submissions 1:1 with ApplicationCases  
- SchoolApp\_Infos 1:1 with SchoolApp\_Submissions  
- ApplicationFiles 1:N with SchoolApp\_Submissions  
- Cases 1:1 with Applications  
- Tasks 1:1 with Cases  
- Attachments 1:1 with Applications and Cases  
- SysFileRefs 1:N with Attachments and AdrBlkFileRefs  
- AdrBlkFileRefs 1:1 with AdrBlk and 1:1 with SysFileRefs

#### 3.1.1. (GCIS) Frontend - Application Forms Submission

This section covers tables related to application form submissions from the frontend.

#### 3.1.2. (GCIS) Frontend - OTP Login Control

This section covers the GenOtp table used for OTP-based login functionality.

#### 3.1.3. (BD) Backend - TBC

This section will contain details about backend-specific tables and their structures.

## 4. Data Entity Description

This section provides detailed information about each table in the database, including column names, data types, key constraints, and descriptions. Microsoft SQL Server 2019 is the chosen DBMS.

**LSCP Frontend Tables:**

| Table ID | LSCP Name | LSCP Entity Description | Key Nature | Key Data Item |
| --- | --- | --- | --- | --- |
| T-S-01 | ApplicationCase | Stores application numbers. | PK | Id |
|  |  |  |  | ApplicationNo |
| T-S-02 | SchoolApp\_Infos | Stores the latest update of submitted application data as a single row. | PK | Id |
|  |  |  |  | ApplicationNo |
| T-S-03 | SchoolApp\_Submissions | Stores submission data for each application. | PK | Id |
|  |  |  |  | ApplicationNo |
|  |  |  |  | SubmissionId |
| T-S-04 | ApplicationFiles | Stores file paths uploaded by applicants. | PK | Id |
|  |  |  |  | ApplicationNo |
|  |  |  |  | SubmissionId |
| T-S-05 | LSCPMasterTable | Stores metadata and parameter data for the frontend. | PK | Id |
|  |  |  |  | Code |
|  |  |  |  | Type + Code |
| T-S-06 | GenOtp | Stores generated OTP codes and their usage status. | PK | Id |
|  |  |  |  | ApplicationNo + userId + Otp |
| T-S-07 | AdrBlk | Stores address data imported from BCIS. | PK | ADR\_BLK\_ID |
| T-S-08 | SYS\_META\_DATA | Stores metadata imported from BCIS. | PK | SYS\_META\_DATA\_ID |
|  |  |  |  | REC\_TYPE |
|  |  |  |  | CODE |
| T-S-09 | Aprse | Stores AP/RSE information imported from MWMS 2.0. | PK | Id |
|  |  |  |  | Name + RegistrationNumber |

**LSCP Backend Tables:**

| Table ID | LSCP Name | LSCP Entity Description | Key Nature | Key Data Item |
| --- | --- | --- | --- | --- |
| T-S-01 | Application | Stores application data. | PK | \_id |
|  |  |  |  | ApplicationNo |
| T-S-02 | Submission | Stores submission data. | PK | \_id |
|  |  |  |  | ApplicationNo |
|  |  |  |  | SubmissionType |
| T-S-03 | Attachment | Stores attachment data. | PK | \_id |
|  |  |  |  | application |
|  |  |  |  | submissionCase |
| T-S-04 | BsBlock | Stores BS Block data. | PK | \_id |
|  |  |  |  | blockId |
| T-S-05 | Task | Stores task data. | PK | \_id |
|  |  |  |  | taskType |
| T-S-06 | Case | Stores case data. | PK | \_id |
|  |  |  |  | application |
| T-S-07 | OAuthToken | Stores OAuth tokens for authentication. | PK | \_id |
|  |  |  |  | accessToken |
| T-S-08 | User | Stores user data. | PK | \_id |
|  |  |  |  | osdpLoginId |
| T-S-09 | Notification | Stores notification data. | PK | \_id |
|  |  |  |  | user |
| T-S-10 | SysFileRef | Stores system file reference data. | PK | \_id |
|  |  |  |  | sysFileRefId |
| T-S-11 | AdrBlkFileRef | Stores address block file reference data. | PK | \_id |
|  |  |  |  | adrBlkFileRefId |
| T-S-12 | Eminute | Stores E-minute data. | PK | \_id |
|  |  |  |  | submissionCase |

### Data Dictionary (Example: Collection: tasks)

**Collection: tasks**

* **Description:** Stores tasks associated with applications and cases.
* **Statistics:**
  + Document Count: 5523
  + Size: 0.99 MB
  + Average Document Size: 0.18 KB
* **Fields:**
* | Field Name | Data Type | Description Physical Data Design for LSCP

# 1. Introduction

This document outlines the physical data design for the Licensing Self-Certification Portal (LSCP) project, focusing on database structure, entity relationships, and data types. It serves as a blueprint for implementing and maintaining a robust and efficient data management system. The design considers both the frontend (GCIS) and backend (BD) aspects of the system.

# 2. Objectives

The LSCP aims to:

1. Provide user-friendly and meaningful messages to users.
2. Store electronic and paper submissions, including safety certificates from applicants, authorized persons (AP), and registered structural engineers (RSE).
3. Enable BD departmental portal login for internal users, supporting User ID/Password authentication.
4. Support modern web browsers.
5. Comply with government system architecture and IT security policies.

# 3. Physical Data Structure Specification

## 3.1. Physical Data Structure

The LSCP uses a relational database structure, primarily MongoDB for the backend and potentially a SQL database for some frontend data. The following entity-relationship diagram illustrates the relationships between key entities:

Entities:  
 - ApplicationCases (SQL)  
 - SchoolApp\_Infos (SQL)  
 - SchoolApp\_Submissions (SQL)  
 - ApplicationFiles (SQL)  
 - LSCPMasterTable (SQL)  
 - GenOtp (SQL)  
 - AdrBlk (SQL)  
 - SYS\_META\_DATA (SQL)  
 - Aprse (SQL)  
 - Application (MongoDB)  
 - Submission (MongoDB)  
 - Attachment (MongoDB)  
 - BsBlock (MongoDB)  
 - Task (MongoDB)  
 - Case (MongoDB)  
 - OAuthToken (MongoDB)  
 - User (MongoDB)  
 - Notification (MongoDB)  
 - SysFileRef (MongoDB)  
 - AdrBlkFileRef (MongoDB)  
 - Eminute (MongoDB)  
  
Relationships (Examples):  
 - SchoolApp\_Submissions 1:1 with ApplicationCases (SQL)  
 - SchoolApp\_Infos 1:1 with SchoolApp\_Submissions (SQL)  
 - ApplicationFiles 1:N with SchoolApp\_Submissions (SQL)  
 - Cases 1:1 with Applications (MongoDB)  
 - Tasks 1:1 with Cases (MongoDB)  
 - Attachments 1:1 with Applications and Cases (MongoDB)  
 - SysFileRefs 1:N with Attachments and AdrBlkFileRefs (MongoDB)  
 - AdrBlkFileRefs 1:1 with AdrBlk and 1:1 with SysFileRefs (MongoDB)

### 3.1.1. (GCIS) Frontend - Application Forms Submission

This section covers tables related to application form submissions from the frontend. These tables are primarily stored in a SQL database.

### 3.1.2. (GCIS) Frontend - OTP Login Control

This section covers the GenOtp table used for OTP-based login functionality. This table is stored in a SQL database.

### 3.1.3. (BD) Backend - Data Storage

The backend data is primarily stored in MongoDB. The key collections include:

* **Application:** Stores core application data (e.g., ApplicationNo, ApplicationType, addresses, applicant information).
* **Submission:** Stores submission-specific data, potentially linked to specific forms or updates.
* **Attachment:** Stores metadata about uploaded files, linking them to applications and cases.
* **BsBlock:** Stores block ID and BDGIS information for address validation.
* **Task:** Stores information about tasks related to cases, including assignee and status.
* **Case:** Stores information about specific cases, including related application, officers, and key dates.
* **OAuthToken:** Stores authentication tokens for users.
* **User:** Stores user account information and roles.
* **Notification:** Stores notifications to be displayed to users.
* **SysFileRef:** Stores system file reference data.
* **AdrBlkFileRef:** Stores address block file reference data.
* **Eminute:** Stores electronic minute data.

# 4. Data Entity Description

This section provides detailed information about each table/collection in the database, including column/field names, data types, key constraints, and descriptions.

## SQL Database Tables (Frontend)

| Table ID | LSCP Name | LSCP Entity Description | Key Nature | Key Data Item |
| --- | --- | --- | --- | --- |
| T-S-01 | ApplicationCase | Table to store all the application number | PK | Id |
|  |  |  |  | ApplicationNo |
| T-S-02 | SchoolApp\_Infos | Table to store the latest update of the submitted application data as 1 row | PK | Id |
|  |  |  |  | ApplicationNo |
| T-S-03 | SchoolApp\_Submissions | Table to store the submission of each application | PK | Id |
|  |  |  |  | ApplicationNo |
|  |  |  |  | SubmissionId |
| T-S-04 | ApplicationFiles | Table to store all the path of applicant upload files | PK | Id |
|  |  |  |  | ApplicationNo |
|  |  |  |  | SubmissionId |
| T-S-05 | LSCPMasterTable | Table to store meta-data or parameter data for frontend | PK | Id |
|  |  |  |  | Code |
|  |  |  |  | Type + Code |
| T-S-06 | GenOtp | Table to store generated OTP codes and their usage status | PK | Id |
|  |  |  |  | ApplicationNo + userId + Otp |
| T-S-07 | AdrBlk | Table to store addresses that import from BCIS | PK | ADR\_BLK\_ID |
| T-S-08 | SYS\_META\_DATA | Table to store meta data that import from BCIS | PK | SYS\_META\_DATA\_ID |
|  |  |  |  | REC\_TYPE |
|  |  |  |  | CODE |
| T-S-09 | Aprse | Table to store AP / RSE information that import from MWMS 2.0 | PK | Id |
|  |  |  |  | Name + RegistrationNumber |

## MongoDB Collections (Backend)

### Collection: Application

* **Description:** Stores core application data.
* **Statistics:**
  + Document Count: 381
  + Size: 0.36 MB
  + Average Document Size: 0.96 KB
* **Fields:**
* | Field Name | Data Type | Description .