Office of the Prime Minister
Central Information Management Unit
Standard document

CIMU S 0030:2003

Data Architecture Standard

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1. **Purpose**

Data Architecture Policies and Standards will be implemented to achieve consistency of data and its definition within information systems used by Government; to be in line with the Data Protection Act and to enable data sharing and systems interoperability across Government organisational units.

2. **Who should know this Standard**

Knowledge of this Standard should extend up and down the organisations concerned with the procurement, development and management of information systems used by the Government of Malta and are to be widespread within them.

   - Information Management Officer
   - Government Ministries
   - Head of Department
   - Information Systems Development

3. **Scope of applicability**

Data Architecture Policies and Standards must be applied when the contents of a data repository used for the delivery of Government services call for data interoperability and when it is mandatory to implement a common registration and authentication process. These standards also apply when a standard audit-trail information record is required.

4. **Definitions**

Refer to list of definitions as per document CIMU P 0030:2003 – Data Architecture Policy

5. **Standard Document**

5.1 **Classification Criteria**

Data Entities will be categorised by selecting one option from each of the following headings:

**Purpose** (Applicable to all the records within a Data Entity)

- **Reference Data** - Data used for classification or selection purposes usually used to populate list boxes.
- **Master File Record** - Data of a slow changing nature used to describe the main business entities.
- **Transaction** - A record containing details of an event or action related to master file data.
- **Link Entity** - Records used to link two records where a many-to-many relationship is required.
- Control/Temporary - Records of a volatile nature used during the processing of data.
- Audit Record - Permanent record containing details of a data modification action.

Updating Mode (Applicable to all records within a Data Entity)
- Read Only - Records that can be used without allowing any modification or additions to the original list.
- Overwrite/Replace - When the contents of a record can be replaced without retaining details of the previous values.
- Updating Archive - When an image of the whole record is retained for each modification or instance of the record.
- Write Once Read Many - After the record is written, no modifications will be allowed.
- Partial Updating - When only the selected attributes can be modified.

Shareability (Applicable to all records within a Data Entity)
- Administrative Shared Data
- Commonly Used Shared Data
- Administrative Local Data
- Business Process Specific Data

Security Level (Applicable to the Data Entity, Row or Attribute level)
- Public Domain Data - Non sensitive publicly available information
- Private/Personal Data - Records that relate to a Person or Organisation
- Confidential - Records containing secret information that should be used with the appropriate safeguards.
- Maximum Impact - Information related to fight against crime or related to the security of the state.

Data Protection (Applicable to all records within a Data Entity)
- Person Details Included
- Impersonal Records

Business Process (Applicable to the Data Entity, Row or Attribute level)
- Business Process / System Function responsible for the automated or computer based data modification.
5.2 Record Structure - Primary Key

An automatically generated serial number must be used to populate the primary key. The use of a (non-composite) numeric primary key is mandatory for all records except in temporary or other run-time tables.

5.3 Record Structure - Record Label

The record label is made up of the following data attributes.

- Session Details (Mandatory when an audit trail is required)
- Time Stamp – (Mandatory)
- Status Indicator – (Mandatory)
- Business Process
- Application System / Program
- Security Level - (Mandatory)
- Data Protection Indicators Record (Mandatory for Person related records)

5.4 Record Structure - Session Details

The record that stores details of the login information used is retained for audit purposes and should consist of the following details.

- User Identification Code
- Person in possession of the User Id
- Type of Login (Individual/Agent)
- Person/Organisation Represented
- Role selected
- Access Device Used
- Date/Time of Login
- Date/Time of Logout
5.5 Naming Convention - Object Prefix

Each data object will be identified by means of the following identification prefix. The object identifier will be the first part of the name with an underscore used as a separator for readability purposes.

- **db** Database
- **tb** Data Entity (Table)
- **idx** Index
- **vw** View/Synonym
- **tr** Trigger
- **sp** Stored Procedure
- **frm** Form (User Interface)
- **rpt** Report
- **qry** Query

5.6 Naming Convention - Database

A database will be identified by means of the object type (db) and a description. The prefix should be maximum four characters followed by a reasonably short string of characters that describes the purpose of the database.

```
db_databaseprefix [ _databasename ]
```

Note (1) databaseprefix must be unique within Government
Note (2) db_ may be replaced by wh_ to represent a Data Warehouse

Example: `db_cdb [ _CommonDatabase ]`

5.7 Naming Convention - Data Entity

The name of a data entity will be made up of the object type (tb) and a description followed by the database prefix within which the table is created. The table prefix (or alias) selected is not used as part of the name but must be assigned and declared as part of the metadata details.

```
tb_tablename_ [ tableprefix ] databaseprefix
```

Note (1) `databaseprefix` is mandatory only when the table contains shareable data
Note (2) `tableprefix` must be unique within the database
Note (3) tb_ may be replaced by wd_ to represent a Data Warehouse Dimension
Note (4) tb_ may be replaced by wf_ to represent a Data Warehouse Fact
Note (5) tb_ may be replaced by ws_ to represent a Data Warehouse Snowflake

Example: `tb_persons [ _per ] [ _cdb ]`
5.8 Naming Convention - Data Element

The name of a data element (with the exception of Foreign Keys) will be made up of the table prefix and a reasonably short description that identifies the contents of the field.

\[ \text{tableprefix\_description} \]

Example: per\_surname

5.9 Naming Convention - Primary Key

The name of the data element chosen as the primary key will be made up of the table, and a description followed by "pk".

\[ \text{tableprefix\_[description\_] pk} \]

Example: per\_[person\_] pk

5.10 Naming Convention - Foreign Key

The name of a data element that is a foreign key will be made up of the source table prefix, the target table prefix, a descriptor followed by "fk".

\[ \text{tableprefix(source)}\_\text{tableprefix(target)}\_[description\_] fk \]

Example: per\_pt\_[person\_] fk

Note: When multiple links are required to the same target, description is mandatory.

When data is downloaded from the corporate tables into the local tables, the following convention should be used for the attribute name.

\[ \text{tablesprefix\_sourcefieldname\_fd} \]

Example: str\_loc\_name\_fd where loc\_name is the field that is copied to the local table. The source field name may omit the table prefix if the remaining string is enough to uniquely identify the data attribute from which the data originates.

5.11 Naming Convention - Index (Alternate Key)

\[ \text{tableprefix\_idx\_indexname} \]

Example: per\_idx\_fullname

Note: One or more data elements must be linked to the indexname.
5.12 Naming Convention - View / Synonym

vw_viewname_databaseprefix (source)  
sn_viewname_databaseprefix (source)

Example: vw_PersonDetails_cdb

      sn_PersonDetails_cdb

5.13 Naming Convention - Stored Procedure

sp_procedurename

Example: sp_CreatePerson

5.14 Naming Convention - Trigger

tr_triggername

Example: tr_deleteperson

5.15 Naming Convention - Record Label

The data elements constituting the record label will be named as follows with

`tableprefix` being replaced by the data entity prefix.

- `tableprefix_session` Session details
- `tableprefix_process` System Function/Business Process
- `tableprefix_appsystem` Application System / Program
- `tableprefix_created` Created/Amended Time Stamp
- `tableprefix_security` Security Indicator
- `tableprefix_status` Status Indicator
- `tableprefix_dp` Data Protection Record

The table prefix may be omitted if a standard function is used to update these
elements unless the prefix is passed as a parameter. When an “on-off” switch is used
to indicate whether the value of a data attribute within a record has been updated, an
additional attribute is added to the record label for each field that is monitored. The
name of this attribute should be:

`original_attribute_name_updt`
5.16 Date

Dates should be stored and communicated internally in the \textit{yyyy-mm-dd} (ISO 8601) format and should be checked for valid dates. When displayed or printed the date should be formatted as \textit{dd-mmm-yyyy} where \textit{mmm} is a three-character representation of the month.

5.17 Time-Stamp

When a time stamp is required, the ISO 8601 standard and format for storage is \textit{yyyy-mm-dd / hh:mm:ss}. The separator between the date and the time can be either a “/” or a “T”. The date and time should be checked for valid date and time values. When displayed or printed, the time-stamp format should be \textit{dd-mm-yyyy hh:mm:ss}

5.18 Identity Card Number

Format is 9999999X (7 digits followed by 1 alphabetic character). The identity card number should be padded with leading zeroes with the alphabetic one character suffix aligned to the right. The following validation rules must be applied

1 - 5 characters: numeric < 32000
6 - 7 characters: between 0 - 99
8 character; (must be one of the following values)

A – Alien  
P - Provisional  
M - Malta (1900 - 1999)  
G - Gozo (1900 - 1999)  
B - Malta (1800 - 1899)  
Z - Gozo (1800 - 1899)  
L - Malta (2000 onwards)  
H - Gozo (2000 onwards)

If the 8th character is A or P, then the validation on the first 7 digits is not applicable as far as the characters 1 - 7 are numeric. The stored ID Card number should be filled with leading zeros to 8 characters in length.

6. Applicable Standards

In support of the listed functionality in the previous section, the following Standards have been identified and are applicable:

01. ISO 3166  
Countries
02. ISO 4217  
Currencies
03. ISO 8601  
Dates and Times
04. ISO 639  
Languages and Dialects
05. NACE  
Business Activity Codes
06. ISCO  
Occupation Codes
7. **Supporting Documents**

In Support to this Standard, the following Policy and Directive refer:

01. CIMU P 0030:2003 Data Architecture Policy
02. CIMU D 0030:2003 Data Architecture Directive

8. **References**

01. Malta Standards Authority – Information Processing Vocabulary

9. **Modification history**

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<th>Changes</th>
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<tr>
<td>2.0</td>
<td>01.10.2003</td>
<td>Scheduled review with minor formatting changes</td>
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10. **Maintenance and review cycle**

Maintenance and review of this Standard is set for six months after the initial release as indicated in the effective date. Subsequent review to this Standard shall be based on a twelve month cycle.

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**Signature and stamp**

Joseph R Grima  
**Permanent Secretary, Office of the Prime Minister**