# Reference and Master Data Management

## Document Data

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## *Basic Information*

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|---|---|---|---|
| Project Name | Reference and Master Data Management | | |
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| Project Manager | Saif M. Alqahtani | | |

## *Purpose*

To describe Reference and Master data management Process, Requirements, Data Hub design and conceptual architecture.

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Classification: -

# 1- Introduction

## 1.1 Reference and Master Data Management (RDM):

In any organization, certain data is required across departments and applications. The whole organization and its departments benefit if this data is shared and all business units can access the same set of data lists like geographic location (city), country, regions, specialties, etc. these data used to run the business.

In SCFHS various project and initiatives, mergers and acquisition and other business activities result in multiple systems executing essential the same functions, which different from each other. These situations inevitably lead to inconsistence in data structure and data values between systems. This variability increase cost and risk. Both can be reduced through the management of Reference and Master Data.

Main goal of reference data to reduce redundancy, ensure high quality and effective use of analytics and reports in organizations. In addition, integration between different application make easier and each system would talk to each other.

Implementing RDM in SCFHS to make sure, the ability to leverage core transactional data is highly dependent on the availability and quality of Reference and Master Data and it would dramatic impact on overall quality of the data and business confidence in data.

## 1.2 Reference Data Identification and Prioritization:

In SCFHS identified 28 Reference data across around 40 different data sources.

The following are list of Reference data and its preference:

| # No | Data Entity | Data Source | Preferred Source | Internal/External |
|---|---|---|---|---|
| **1** | Case Status | Mumaris Plus | Mumaris Plus | Internal |
| **2** | Cities | 1. Academy<br>2. Appointments Booking<br>3. Assessment<br>4. Collaboration<br>5. Committees<br>6. Financial Compensation<br>7. Health Academy<br>8. Health Academy Nomination<br>9. HLS<br>10. HR<br>11. HRSD<br>12. Law Affairs<br>13. Leadership Academy<br>14. LMS<br>15. Matching<br>16. Matching Fellowship<br>17. MOE<br>18. MOH | Mumaris Plus | Internal |



Classification: -

| | | | | |
|---|---|---|---|---|
| | | 19. Mumaris Plus<br>20. Mustamir<br>21. One45<br>22. Portal<br>23. Training<br>24. Well Being | | |
| **3** | Classification Rank | 1. Mumaris Plus<br>2. Mustamir<br>3. Portal | Mumaris Plus | Internal |
| **4** | Committees | 1. Committees<br>2. Mumaris Plus | Committees | Internal |
| **5** | Councils | Committees | Committees | Internal |
| **6** | Countries | 1. Academy<br>2. Appointments Booking<br>3. Assessment<br>4. Collaboration<br>5. Financial Compensation<br>6. Hadir<br>7. Health Academy<br>8. Health Academy Nomination<br>9. HR<br>10. HRSD<br>11. LMS<br>12. Matching<br>13. Matching Fellowship<br>14. MCS<br>15. MOE<br>16. MOH<br>17. Mumaris Plus<br>18. Mustamir<br>19. NGHA<br>20. One45<br>21. Portal<br>22. Training<br>23. Well Being | Mumaris Plus | Internal |
| **7** | Exam Status | Mumaris Plus | Mumaris Plus | Internal |
| **8** | Exam Result Types | 1. Mumaris Plus<br>2. Training | Mumaris Plus | Internal |
| **9** | Exam Sections | Integration | | External |
| **10** | Exams | 1. Matching<br>2. Mumaris Plus<br>3. Portal | Mumaris Plus | Internal |
| **11** | Gender | 1. Appointments Booking<br>2. Health Academy<br>3. HR<br>4. HRSD | Mumaris Plus | Internal |



Classification: -

| | | | | |
|---|---|---|---|---|
| | | 5. Leadership Academy<br>6. Matching<br>7. Matching Fellowship<br>8. MOE<br>9. Mumaris Plus<br>10. Mustamir<br>11. NGHA<br>12. One45<br>13. Portal<br>14. Statistics<br>15. Training | | |
| **12** | Health Association | 1. Association Sheets<br>2. Portal | Health Association | Internal |
| **13** | Marital Status | 1. Health Academy<br>2. HR<br>3. Mumaris Plus | Mumaris Plus | Internal |
| **14** | Medical Fields | 1. Appointments Booking<br>2. Internship Capacity Sheet<br>3. Matching<br>4. MLSD<br>5. Mumaris Plus<br>6. Mustamir<br>7. Nurse Visa<br>8. Portal<br>9. Training | Mumaris Plus | Internal |
| **15** | Organization Sites | 1. Appointments Booking<br>2. Committees<br>3. GL<br>4. Hadir<br>5. HR<br>6. Portal | HR | Internal |
| **16** | Organization Units | 1. Collaboration<br>2. Committees<br>3. GL<br>4. Hadir<br>5. HR<br>6. Portal<br>7. Service Desk<br>8. TAWASOL | HR | Internal |
| **17** | Regions | 1. Appointments Booking<br>2. Elham<br>3. Health Academy<br>4. HLS<br>5. HRSD<br>6. Mustamir<br>7. Statistics | Training | Internal |



Classification: -

| | | | | |
|---|---|---|---|---|
| | | 8. Training | | |
| **18** | Religions | 1. HR<br>2. Mumaris Plus | Mumaris Plus | Internal |
| **19** | Saudi Colleges Branches | Portal | Portal | Internal |
| **20** | Specialties | 1. Elham<br>2. Health Academy Nomination<br>3. Matching<br>4. Matching Fellowship<br>5. MOE<br>6. Muetamid<br>7. Mustamir<br>8. One45<br>9. Portal<br>10. Press Ganey Survey<br>11. Training<br>12. Well Being | Training | Internal |
| **21** | Specialties Mumaris | Mumaris Plus | Mumaris Plus | Internal |
| **22** | State Code | Mumaris Plus | Mumaris Plus | Internal |
| **23** | Training Center | 1. Health Academy<br>2. Matching<br>3. Matching Fellowship<br>4. Muetamid<br>5. One45<br>6. Portal<br>7. Press Ganey Survey<br>8. Training<br>9. Well Being | Muetamid | Internal |
| **24** | Training Exam Type | 1. Portal<br>2. Training | Training | Internal |
| **25** | Training Sector | 1. Health Academy Nomination<br>2. Matching<br>3. Matching Fellowship<br>4. Muetamid<br>5. One45<br>6. Training | Muetamid | Internal |
| **26** | Universities | 1. Health Academy<br>2. Health Academy Nomination<br>3. HRSD<br>4. Matching<br>5. Matching Fellowship<br>6. MOE<br>7. Mumaris Plus | Mumaris Plus | Internal |



Classification: -

| | | | | |
|---|---|---|---|---|
| | | 8. Portal<br>9. Training | | |
| **27** | University Branches | Mumaris Plus Portal | Mumaris Plus | Internal |
| **28** | Work Place | 1. Academy<br>2. Committees<br>3. Health Academy Nomination<br>4. HLS<br>5. HRSD<br>6. Internship Capacity Sheet<br>7. LMS<br>8. Matching<br>9. Matching Fellowship<br>10. MCS<br>11. MLSD<br>12. MOE<br>13. MOH<br>14. Mumaris Plus<br>15. NGHA<br>16. Portal<br>17. Public Relations<br>18. Training<br>19. Well Being | MOH | External |

### 1.3 Master data Identification and Prioritization:

| # No | Data Entity | Data Source | Preferred Source | Internal/External |
|---|---|---|---|---|
| **1** | Unique Profile(Practitioners) | 1. Mumaris Plus<br>2. E Service<br>3. Training<br>4. Matching<br>5. One45<br>6. Oracle HR<br>7. Majales-Committee<br>8. Health Academy | Mumaris Plus | Internal |



Classification: -

# 2- Reference and Master Data Requirements

Application and data evolve organically resulting in multiple systems executing similar functions isolated from each other, leading to inconsistencies in data structure and values, and increased costs and risks. Both can be reduced through the management of reference and master data

In addition to that, the following are main goal:

1. Sharing of same unified data to all applications within an organization
2. Reference and Master data enable accurate values and reduce duplicate from same or multiple data sources
3. Reduce the complexity of Integration and data models

## 2.1 Reason for Reference and Master Data

Consider the Country table from different application has more than one standards and following different coding system and description.

The following are example from SCFHS country table from more than 30 application including internal and external data.

The data structure describe as follows:

1. **Data Entity** - describe the reference entity name
2. **ID** - Primary Key of country Reference master data
3. **Name** - unique name country
4. **Data Source** -describe about the list of application name from where the data is populated
5. **Old Record Id** – source data primary key
6. **Old Record Name** – Source data description
7. **Old Extra Info1** – Additional information
8. **Map Id** – each source has unique Map Id and configuration about mapping between source and Reference Master data
9. **Mapping Title** – Describe source application name from where the data is arrived



Classification: -

The following sample describe the same country name"Saudi Arabia" has referred as different code in each system and even different formations.

| Data Entity | ID | Name | Data Source | Old Record Id | Old Record Name | Old Extra Info1 | Map Id | Mapping Title |
|---|---|---|---|---|---|---|---|---|
| Countries | 1 | Saudi Arabia | Mumaris Plus | 883470F7-5DF9-E811-B80F-005056AD2FD8 | السعودية | Saudi Arabia | 3 | Countries From Mumaris+ |
| | | | Academy | SA | SA | ..... | 92 | Countries From Academy |
| | | | Appointments Booking | Saudi Arabia | Saudi Arabia | ..... | 125 | Nationalities From Appointments Booking |
| | | | Training | 1 | السعودية | Saudi Arabia | 4 | Nationalities From Training |
| | | | Appointments Booking | المملكة العربية السعودية | المملكة العربية السعودية | ..... | 125 | Nationalities From Appointments Booking |
| | | | Assessment | Saudi Arabia | Saudi Arabia | ..... | 79 | Countries From Assessment Testing Centers Excel |
| | | | Collaboration | 37 | Saudi Arabia | ..... | 99 | Countries From Collaboration |
| | | | Collaboration | 59 | Saudi | ..... | 102 | Nationality From Collaboration |
| | | | Financial Compensation | SA | المملكة العربية السعودية | Saudi Arabia | 169 | Nationalities From Financial Compensation |



Classification: -

## 2.3 Rules for mapping Reference and Master Data:

The definition of creating rules to construct reference data would be as follows:

1. Identification of Reference data
2. Matching Method and Types
3. Considerations
4. Authority Strategy
5. Consolidation

### 2.3.1 Identification of Reference Data:

Data is typically **replicated in multiple silos** (databases, Excel spreadsheets, etc.) the same set of data spread across the enterprise with different coding and descriptions. This affects the quality**,** consistency, and availability of data. Data quality issues lead to failures in business processes and transactions. Hence, identify the entity, which requires Reference data treatment.

### 2.3.2 Matching Method and Types:

There are different types of matching that can be accomplished from automated rules to match data together, or have it gone through a review process.

There are variety of matching types possible, from exact matching and Similarity matching.

Exact Match: An exact match relies on being able to link two different sources of information based on the existence of a specific key that allows to match the information. This can be, for instance, a Country Name for country.

Similarity Match: Matching based on similar names of spellings to classify into same group When this happens, we need to be able to relax the matching algorithm to handle phonetically similar cases.

SCFHS follows both mentioned matching methods to create reference data

### 2.3.3 Reference Data Consideration:

There has to be multiple considerations to have when looking at the merging of data. Entities can have multiple names, languages can be impactful in the cases of names, places, or universities, data should be normalized, and data cleansing is usually necessary before matching the different attributes

When Name used to match one of the important factors has to take into consideration is that frequency of name. If the names are common should need special treatment by considering other columns to take proper merging either auto match or manually.

SCFHS follow these mentioned consideration while doing the merging of Reference data.

In addition to that match different text fields also requires some degree of data cleansing. From handling potential trimming of spaces, special characters, and punctuations to correcting misspellings, there are numerous steps to take to standardize the input and allow it to find an accurate match.



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The SCFHS has more than 30 profile rules to do cleansing any kind of data based on data type and nature of the data.

### 2.3.4 Authority Strategy:

If the same set of data available and when conflicting information available in more than one application and database the Authority strategy help to define which source and field in the strategy should be considered as the authoritative source of information.

SCFHS follows preference order for taking certain types of information from different sources. The logic behind this type of strategy is that some sources of information should be considered as "**trusted sources**," while others have information of different qualities

### 2.3.5 Consolidation:

The consolidation rule describe how the records are merged. There are generally two different types of consolidation strategies hard merge and soft merge. The hard merge consolidate multiple records into one single record, while a soft merge strategy creates an association between the different records that, when read, should be grouped.

SCFHS handle the hybrid based on nature of data, sometimes there might by one row for more than one same set of names.

## 2.4 Consume Applications:

Most of the data-sharing request are utilized Reference and Master Data. In addition to that 1000+dashboards and reports are consuming Reference and Master data.

SCFHS Exchange database support other department to utilize the Reference and master data for various functions.

In addition to that public dashboard also using dimension and filter from Reference Master Data

## 2.5 Data quality requirements for Reference and Master Data:

In the data quality, one of the data quality dimension Accuracy is used to handle reference and transaction data integration.

The degree to which data correctly describes the "real world" object or event being described. Can be derived from whether a given value is the same as in the 'master' dictionary

Reference: Missing data is not included in this measurement. For example, does the university reflect the actual university name stored in the qualification data set. This accuracy is measured for fact data using dimensions

Dashboard shows data quality over all health index and accuracy dimension :



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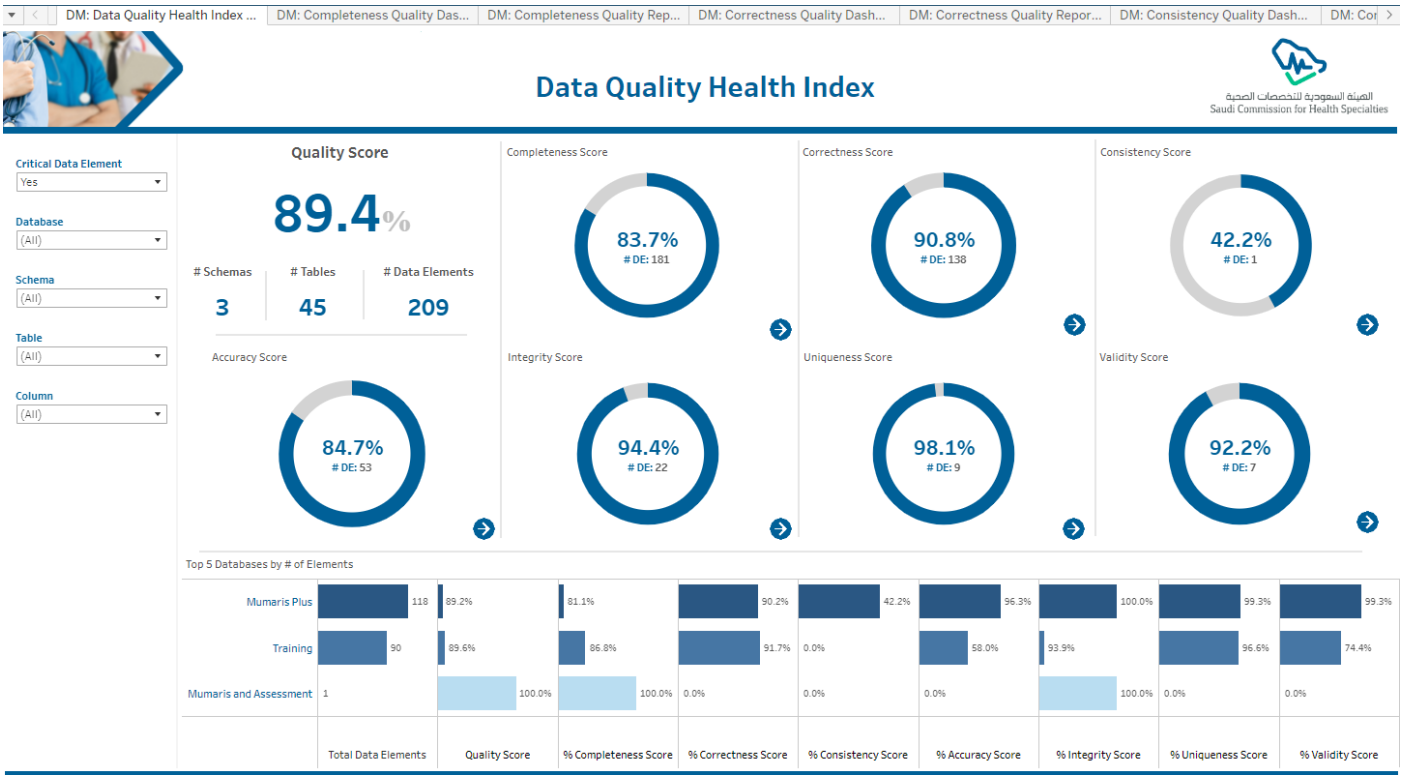
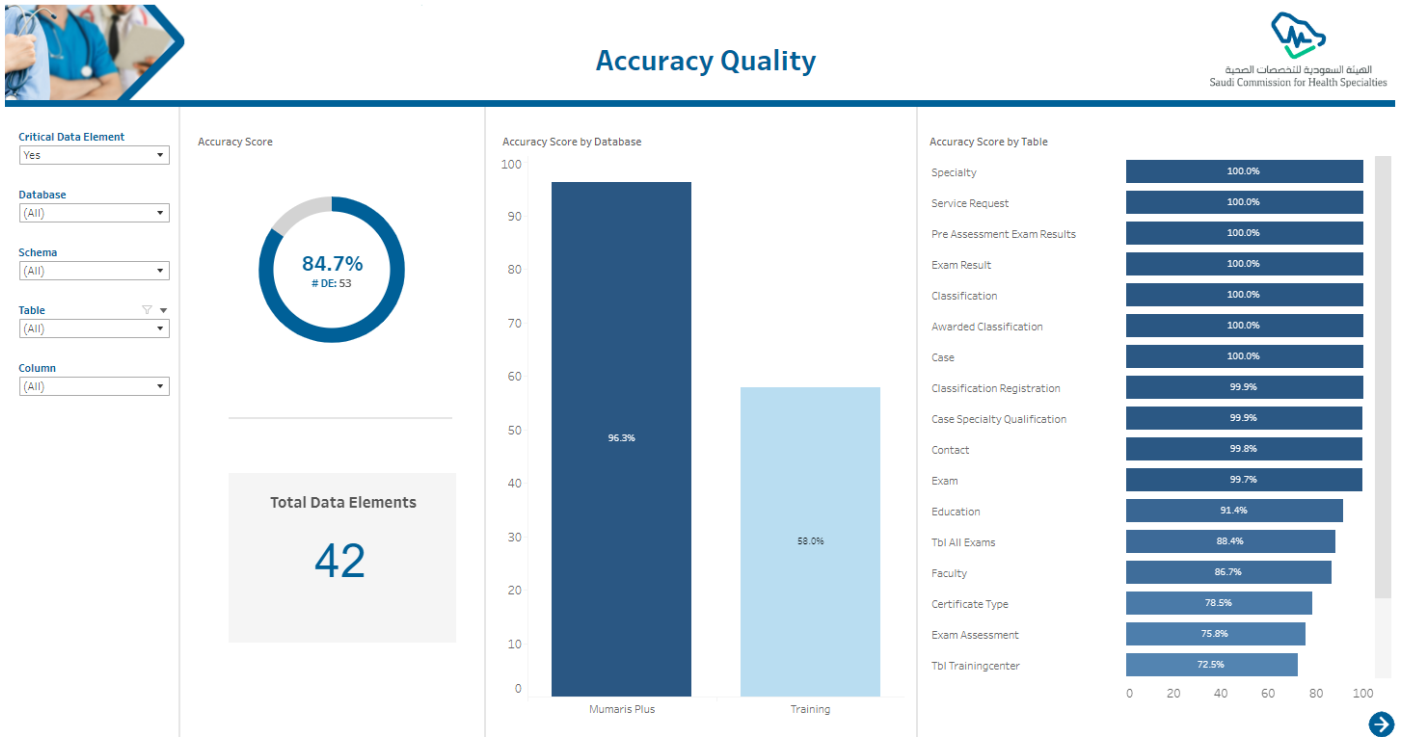



Accuracy Dimension:



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Accuracy Dimension Detail Report:

## Accuracy Quality Details

الهيئة السعودية للتخصصات الصحية
Saudi Commission for Health Specialties

Critical Data Element: Yes
Database: (All)
Schema: (All)
Table: (All)
Column: (All)

Download Data

| Database | Schema | Table | Column | Total Non-Blank | Total Accurate | Total Non-Accurate | % of Accuracy |
|---|---|---|---|---|---|---|---|
| Mumaris Plus | Mumaris Plus Main | Awarded Classification | Classification Rank | 1,286,707 | 1,292,916 | 0 | 100.0% |
| Mumaris Plus | Mumaris Plus Main | Case | Classification Rank | 3,964,940 | 3,991,574 | 0 | 100.0% |
| Mumaris Plus | Mumaris Plus Main | Case | Country Of Residence | 4,422,257 | 4,454,474 | 345 | 100.0% |
| Mumaris Plus | Mumaris Plus Main | Case | Medical Professional Field | 4,265,306 | 4,295,543 | 0 | 100.0% |
| Mumaris Plus | Mumaris Plus Main | Case | Religion | 2,218,012 | 2,250,565 | 0 | 100.0% |
| Mumaris Plus | Mumaris Plus Main | Case | Speciality | 4,289,759 | 4,314,593 | 5,231 | 99.9% |
| Mumaris Plus | Mumaris Plus Main | Case | Specialty Medical Field | 4,287,826 | 4,312,662 | 5,230 | 99.9% |
| Mumaris Plus | Mumaris Plus Main | Case Specialty Qualification | Speciality | 2,649,728 | 2,658,461 | 3,017 | 99.9% |
| Mumaris Plus | Mumaris Plus Main | Certificate Type | University | 45,656 | 35,926 | 9,865 | 78.5% |
| Mumaris Plus | Mumaris Plus Main | Classification | Medical Professional Field | 64 | 65 | 0 | 100.0% |
| Mumaris Plus | Mumaris Plus Main | Classification Registration | Medicalprofessionalfield | 2,245,469 | 2,353,339 | 0 | 100.0% |
| Mumaris Plus | Mumaris Plus Main | Classification Registration | Registered Rank | 2,227,563 | 2,333,592 | 0 | 100.0% |
| Mumaris Plus | Mumaris Plus Main | Classification Registration | Speciality | 2,357,750 | 2,461,008 | 2,779 | 99.9% |
| Mumaris Plus | Mumaris Plus Main | Classification Registration | Specialty Medical Field | 2,356,414 | 2,459,605 | 2,777 | 99.9% |
| Mumaris Plus | Mumaris Plus Main | Contact | City | 808,121 | 798,645 | 9,477 | 98.8% |
| Mumaris Plus | Mumaris Plus Main | Contact | Country Of Residence (Lookup) | 1,234,614 | 1,239,562 | 315 | 100.0% |
| Mumaris Plus | Mumaris Plus Main | Contact | Country Of Study | 727,175 | 726,884 | 292 | 100.0% |
| Mumaris Plus | Mumaris Plus Main | Contact | Countryofbirth(Lookup) | 1,221,892 | 1,226,330 | 758 | 99.9% |
| Mumaris Plus | Mumaris Plus Main | Contact | Evaluator Specialty | 13 | 13 | 0 | 100.0% |
| Mumaris Plus | Mumaris Plus Main | Contact | Gender | 1,234,628 | 1,239,891 | 0 | 100.0% |
| Mumaris Plus | Mumaris Plus Main | Contact | Nationality(Lookup) | 1,234,527 | 1,238,455 | 1,335 | 99.9% |
| Mumaris Plus | Mumaris Plus Main | Contact | Professional Medical Field | 1,023,632 | 1,026,076 | 0 | 100.0% |
| Mumaris Plus | Mumaris Plus Main | Contact | Religion | 1,234,628 | 1,239,891 | 0 | 100.0% |
| Mumaris Plus | Mumaris Plus Main | Education | Country Of Study | 2,295,385 | 2,303,572 | 1,862 | 99.9% |
| Mumaris Plus | Mumaris Plus Main | Education | Speciality | 1,576,051 | 1,574,971 | 1,095 | 99.9% |
| Mumaris Plus | Mumaris Plus Main | Education | University | 2,268,105 | 1,693,303 | 584,742 | 74.3% |
| Mumaris Plus | Mumaris Plus Main | Exam | Classification Rank | 161 | 163 | 0 | 100.0% |
| Mumaris Plus | Mumaris Plus Main | Exam | Specialty | 161 | 162 | 1 | 99.4% |



Classification: -

# 3- Reference Data HUB Design

SCFHS Hub Design support Centralized management of Reference Data - the Hub acting as single source provider for entire Reference Data to create and modify exclusively in the Hub. All dashboard, data sharing, and exchange database users utilize the Reference Data.

In SCFHS Hub design is maintained in EDW layer with full functionality of Reference data which read all the data sources from Hub layer.

## 3.1 Reference Data Design

Reference data has been follows typical methodology to create accurate data from different data source.

1. Identify the reference data
2. Entry in MDM(Master data management) configuration table which requires mapping manually by defining the source schema and table name to map with reference table, which is start with "lkp_un".

For ex. Countries Reference table name is lkp_un_Country" and the source mapping table name is (old table) "mpd_scfhs_countryBase", old id is scfhs_CountryId (Primary key from source) and old name is scfhs_CountryNameInArabic (country name from source) which is going to link with lkp_un_country table

| Map_Id | System_Desc | Entity_Des | New_Table | New_Id | New_Name | Mapping_Column | Old_Table | Old_Id | Old_Name | Mapping_Title | Dim_Table | Dim_Id |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | Mumaris Plus | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_mpd_Mumaris_CountryId | mpd_scfhs_countryBase | scfhs_CountryId | scfhs_CountryNameInArabic | Countries From Mumaris+ | Dim_Country | Country_Id |
| 4 | Training | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_trd_Trainees_CountryId | trd_tbl_NationalityName | intNationalityID | strNationalityName | Nationalities From Training | Dim_Country | Country_Id |
| 5 | Mumaris Plus | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_mpd_Mumaris_NationalityId | mpd_scfhs_nationalitiesBase | scfhs_nationalitiesId | scfhs_NationalityNameInArabic | Nationalities From Mumaris+ | Dim_Country | Country_Id |
| 16 | Portal | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_src_Prof_Assesment_NationalityID | src_professionalLicenseTestNationalitie | ID | Title | Countries From Portal Exams | Dim_Country | Country_Id |
| 28 | Portal | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_src_Scfhs_NationalityID | src_Nationality | Nationality_ID | NationalityName_AR | Nationalities From Portal | Dim_Country | Country_Id |
| 29 | Matching | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_mtl_Lookups_NationalityID | mtl_Nationality | NationalityID | NameAR | Nationalities From Matching | Dim_Country | Country_Id |
| 30 | Matching | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_mtl_Lookups_CountryID | mtl_Country | CountryID | NameAR | Countries From Matching | Dim_Country | Country_Id |
| 56 | HR | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_ohr_CountryId | V_ohr_countries | Country_Code | Country_AR | Countries From HR | Dim_Country | Country_Id |
| 59 | HR | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_ohr_NationalityId | V_ohr_nationality | Nationality_Code | Nationality_AR | Nationalities From HR | Dim_Country | Country_Id |
| 75 | MOE | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_exd_moe_Country | V_exd_extr_MOE_Countries | Country_Name | Country_Name | Countries From MOE | Dim_Country | Country_Id |
| 76 | One45 | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_eon_CountryId | eon_countries | countryId | countryName | Countries From One45 | Dim_Country | Country_Id |
| 78 | One45 | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_eon_NationalityId | V_eon_Nationality | Nationality_Id | Nationality_Name | Nationalities From One45 | Dim_Country | Country_Id |
| 79 | Assessment | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_exd_rec_amt_Country | V_exd_rec_amt_Country | Country_Id | Country_Name | Countries From Assessment Testing Centers Exce | Dim_Country | Country_Id |
| 86 | HR | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_ohr_Establishment_Country | V_ohr_Establishment_Country | Country_Id | Country_Name | Establishments Countries From HR | Dim_Country | Country_Id |
| 92 | Academy | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_Academy_Country | V_eac_Country | Country_ID | Country_Name | Countries From Academy | Dim_Country | Country_Id |
| 96 | LMS | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_Lms_Country | V_elm_Country | Country_ID | Country_Name | Countries From LMS | Dim_Country | Country_Id |
| 99 | Collaboration | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_ecl_Country | ecl_Country | Country_ID | Country_Name | Countries From Collaboration | Dim_Country | Country_Id |
| 102 | Collaboration | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_ecl_Nationality | ecl_Nationality | ID | Nationality | Nationality From Collaboration | Dim_Country | Country_Id |
| 106 | MCS | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_exd_mcs_Nationality | V_exd_extr_mcs_Nationality | Nationality_Id | Nationality_Name | Nationalities From MCS | Dim_Country | Country_Id |
| 115 | Hadir | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_hdr_Country | hdr_Country | CountryId | ArName | Countries From Hadir System | Dim_Country | Country_Id |
| 120 | MOE | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_exd_moe_Nationality | V_exd_extr_MOE_Nationalities | Nationality_Id | Nationality_Name | Nationalities From MOE | Dim_Country | Country_Id |
| 125 | Appointments Book | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_ato_Nationality | V_ato_Nationality | Nationality_Id | Nationality_Name | Nationalities From Appointments Booking | Dim_Country | Country_Id |
| 131 | Mustamir | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_mud_CountryId | V_emu_Countries | Country_Id | Country_Ar | Countries from Mustamir | Dim_Country | Country_Id |
| 141 | Health Academy | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_had_Country | had_Country | Country_ID | CountryName_AR | Countries From Health Academy | Dim_Country | Country_Id |
| 151 | HRSD | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_exd_HRSD_Nationality | V_exd_hrsd_Nationality | Nationality_Code | Nationality_Name | Nationalities From HRSD | Dim_Country | Country_Id |
| 161 | Health Academy Nc | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_han_Country | V_han_country | ID | Name_EN | Countries From Health Academy Nomenation | Dim_Country | Country_Id |
| 169 | Financial Compnsat | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_ofw_Nationality | ofw_CMN_NATIONALITY | Code | NAME_AR | Nationalities From Financial Compnsation | Dim_Country | Country_Id |
| 177 | Well Being | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_Wellbeing_Country | V_WellBeing_Country | Country_Id | Country_Name | Countries From Wellbeing | Dim_Country | Country_Id |
| 181 | Matching Fellowshi | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_mfl_Lookups_CountryID | mfl_Country | CountryID | NameAR | Countries From Matching Fellowship | Dim_Country | Country_Id |
| 183 | Matching Fellowshi | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_mfl_Lookups_NationalityID | mfl_Nationality | NationalityID | NameAR | Nationalities From Matching Fellowship | Dim_Country | Country_Id |
| 186 | Portal | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_src_Scfhs_Country_ID | src_Country | Country_ID | CountryName_AR | Countries From Portal | Dim_Country | Country_Id |
| 196 | NGHA | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_NGHA_Nationality | V_exd_rec_NGHA_Data_Nationality | Nationality_ID | Nationality_Name | Nationalities From NGHA | Dim_Country | Country_Id |
| 199 | MOH | Countries | lkp_un_Country | Country_Id | Country_Arabic_Name | Map_MOH_Nationality | V_moh_Nationalities | Nationality | Nationality | Nationalities From MOH | Dim_Country | Country_Id |

3. Create mapping column in respective reference table which is used as mapping column(Map_mpd_Mumaris_CountryId) between source and target in lkp_un_country table
4. Auto match algorithm is used to fill the mapping data automatically if the names are similar between reference table and source table
5. Finally the mapping configuration procedure (dq_store_map_data) will collect all the matching records and keep it in valid map record table
6. Manually has to maintain the mapping for those records not matched automatically



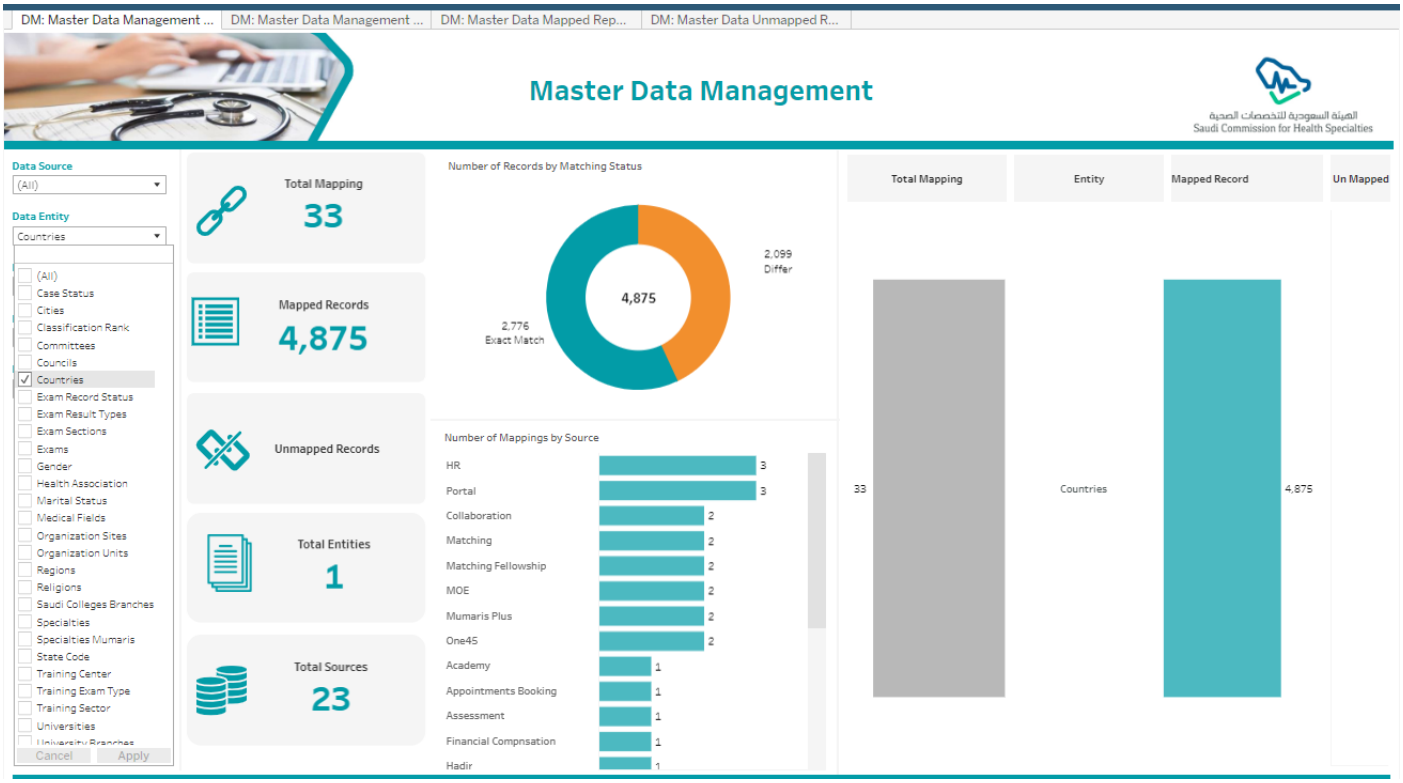
Classification: -

### 3.2 Reference Data Structure:

Any reference data should normally describe about pairs a code value with description. The code value is Primary Key and description states definition

| Country Id | Name_En | Name_Ar |
|---|---|---|
| 0 | Unknown | غير معرف |
| 1 | Saudi Arabia | السعودية |
| 2 | Egypt | مصر |
| 3 | Germany | ألمانيا |

Dashboard shows country entity data mapping details, so far 33 different data sources are mapped with Country reference data and around 4800 records are mapped.




Dashboard shows how many records are mapped to country Reference data from each data source:



Classification: -

DM: Master Data Management ... | DM: Master Data Management ... | DM: Master Data Mapped Rep... | DM: Master Data Unmapped R...

## Master Data Mapped

| Data Entity | Data Source | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Academy | Appointments Booking | Assessment | Collaboration | Financial Compnsation | Hadir | Health Academy | Health Academy Nomenation | HR | |
| Countries | [92] 3 | [125] 163 | [73] 94 | [99] 55 [102] 80 | [169] 247 | [115] 248 | [141] 246 | [161] 85 | [56] 214 [59] 39 [86] 69 | [151] 160 |

Mapping between different source to Country Reference data for Saudi Arabia :

DM: Master Data Management ... | DM: Master Data Management ... | DM: Master Data Mapped Rep... | DM: Master Data Unmapped R...

## Master Data Management Summary

New Record Id | New Record Name | New Extra Info1 (All) | New Extra Info2 ..... | Old Record Id | Old Record Name | Old Extra Info1 (All) | Old Extra Info2 (All) | Download Data

| Data Entity | New Record Id | New Record Name | New Extra Info1 | New Extra Info2 | Data Source | Old Record Id | Old Record Name | Old Extra Info1 |
|---|---|---|---|---|---|---|---|---|
| | 1 | السعودية | Saudi Arabia | ..... | Academy | SA | SA | ..... |
| | | | | | Appointments Booking | Saudi Arabia | Saudi Arabia | ..... |
| | | | | | | المملكة العربية السعودية | المملكة العربية السعودية | ..... |
| | | | | | Assessment | Saudi Arabia | Saudi Arabia | ..... |
| | | | | | Collaboration | 37 | Saudi Arabia | ..... |
| | | | | | | 59 | Saudi | ..... |
| | | | | | Financial Compnsation | SA | المملكة العربية السعودية | Saudi Arabia |
| | | | | | Hadir | SA | المملكة العربية السعودية | Saudi Arabia |
| | | | | | Health Academy | 244 | السعودية | Saudi Arabia |
| | | | | | | 285 | السعودية | Saudi |
| | | | | | Health Academy Nomenation | 3 | Saudi Arabia | Saudi Arabia |
| | | | | | | المملكة العربية السعودية | المملكة العربية السعودية | المملكة العربية السعودية |
| | | | | | | حائل | حائل | حائل |

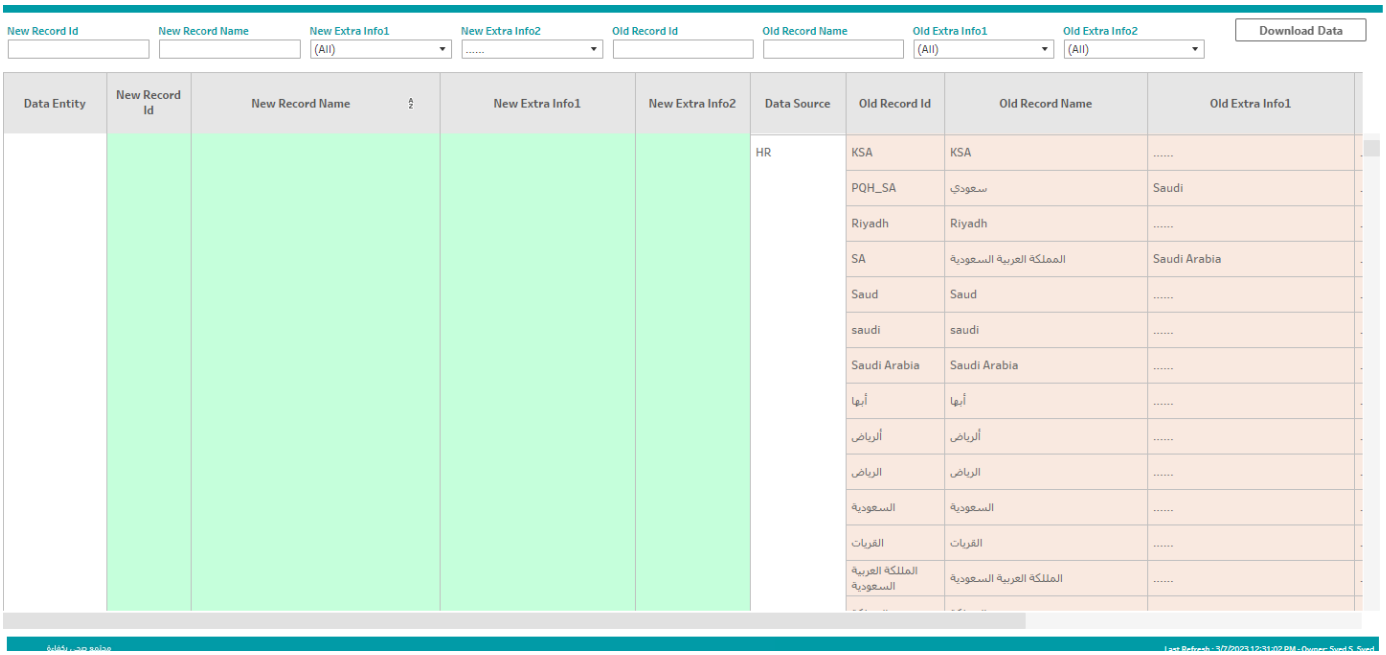
مجتمع صحي بكفاءة

Last Refresh : 3/7/2023 12:31:02 PM - Owner: Syed S. Syed

Contd.,



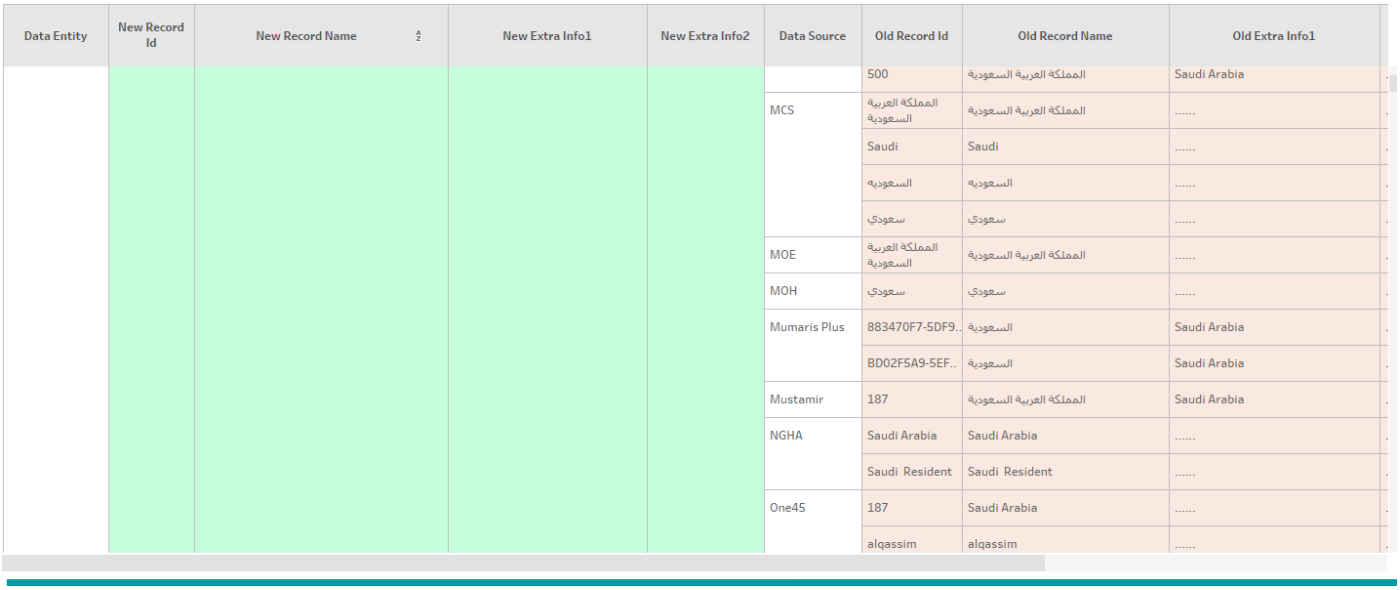
Classification: -



New Record Id | New Record Name | New Extra Info1 (All) | New Extra Info2 ..... | Old Record Id | Old Record Name | Old Extra Info1 (All) | Old Extra Info2 (All) | Download Data

| Data Entity | New Record Id | New Record Name | New Extra Info1 | New Extra Info2 | Data Source | Old Record Id | Old Record Name | Old Extra Info1 |
|---|---|---|---|---|---|---|---|---|
| | | | | | HR | KSA | KSA | ..... |
| | | | | | | PQH_SA | سعودي | Saudi |
| | | | | | | Riyadh | Riyadh | ..... |
| | | | | | | SA | المملكة العربية السعودية | Saudi Arabia |
| | | | | | | Saud | Saud | ..... |
| | | | | | | saudi | saudi | ..... |
| | | | | | | Saudi Arabia | Saudi Arabia | ..... |
| | | | | | | أبها | أبها | ..... |
| | | | | | | ألرياض | ألرياض | ..... |
| | | | | | | الرياض | الرياض | ..... |
| | | | | | | السعودية | السعودية | ..... |
| | | | | | | القريات | القريات | ..... |
| | | | | | | المملكة العربية السعودية | المملكة العربية السعودية | ..... |

Contd.,



| Data Entity | New Record Id | New Record Name | New Extra Info1 | New Extra Info2 | Data Source | Old Record Id | Old Record Name | Old Extra Info1 |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 500 | المملكة العربية السعودية | Saudi Arabia |
| | | | | | MCS | المملكة العربية السعودية | المملكة العربية السعودية | ..... |
| | | | | | | Saudi | Saudi | ..... |
| | | | | | | السعوديه | السعوديه | ..... |
| | | | | | | سعودي | سعودي | ..... |
| | | | | | MOE | المملكة العربية السعودية | المملكة العربية السعودية | ..... |
| | | | | | MOH | سعودي | سعودي | ..... |
| | | | | | Mumaris Plus | 883470F7-5DF9.. | السعودية | Saudi Arabia |
| | | | | | | BD02F5A9-5EF.. | السعودية | Saudi Arabia |
| | | | | | Mustamir | 187 | المملكة العربية السعودية | Saudi Arabia |
| | | | | | NGHA | Saudi Arabia | Saudi Arabia | ..... |
| | | | | | | Saudi Resident | Saudi Resident | ..... |
| | | | | | One45 | 187 | Saudi Arabia | ..... |
| | | | | | | alqassim | alqassim | ..... |

List of un mapped records from University Reference which need to map: Using this dashboard all unmapped records are mapped to Reference table as daily operational work.



Classification: -

DM: Master Data Management ... | DM: Master Data Management ... | DM: Master Data Mapped Rep... | DM: Master Data Unmapped R...

## Master Data Unmapped

الهيئة السعودية للتخصصات الصحية
Saudi Commission for Health Specialties

Old Record Id | Old Record Name | Old Extra Info1 (All) | Old Extra Info2 (All) | Download Data

| Data Entity | Data Source | Old Record Id | Old Record Name | Old Extra Info1 | Old Extra Info2 | Map I |
|---|---|---|---|---|---|---|
| Universities | Health Academy Nomenation | Suffolk University | Suffolk University | الولايات المتحدة الأمريكية | United States | 164 |
| | | 2022 | 2022 | المملكة العربية السعودية | Saudi Arabia | 164 |
| | | (جامعة الملك عبد العزيز) | (جامعة الملك عبد العزيز) | المملكة العربية السعودية | Saudi Arabia | 164 |
| | | Al Faisal University | Al Faisal University | المملكة العربية السعودية | Saudi Arabia | 164 |
| | | Al-Ghad International College of Applied Medical Sciences | Al-Ghad International College of Applied Medical Sciences | المملكة العربية السعودية | Saudi Arabia | 164 |
| | | Alfarabi college | Alfarabi college | المملكة العربية السعودية | Saudi Arabia | 164 |
| | | Alghad international college | Alghad international college | المملكة العربية السعودية | Saudi Arabia | 164 |
| | | Alghad international college for medical applied scince | Alghad international college for medical applied scince | المملكة العربية السعودية | Saudi Arabia | 164 |
| | | alghad international colleges | alghad international colleges | المملكة العربية السعودية | Saudi Arabia | 164 |
| | | alghad iternatoinal college | alghad iternatoinal college | المملكة العربية السعودية | Saudi Arabia | 164 |
| | | Alqassim university | Alqassim university | المملكة العربية السعودية | Saudi Arabia | 164 |
| | | Anglia Ruskin | Anglia Ruskin | المملكة المتحدة | United kingdom | 164 |
| | | Auckland university of technology | Auckland university of technology | New Zealand | New Zealand | 164 |
| | | Bay Path University | Bay Path University | الولايات المتحدة الأمريكية | United States | 164 |
| | | Bisha University | Bisha University | المملكة العربية السعودية | Saudi Arabia | 164 |

### 3.3 Master Data Hub Design:

SCFHS has beneficiary master data derived from different data sources. Beneficiary could be practitioners, trainee, license exam student,etc.,

The design phase consists of three steps ;

1. Integrate master records using **Identity Number** (National Id) from different sources the SCFHS has dm profile table to keep all the similar beneficiary records

2. Based on data source preference the golden records are generated and stored in unique profile mart

3. In addition to that collect and keep the transaction about the beneficiary from all the preferred data sources.

The master data preference is about to ordering based on trusty source, in this case Mumaris plus is the first preference and other data source preference and order as follows:

a. Mumaris-Profile
b. Portal-Profile
c. Training-Profile
d. Matching-Profile
e. One45-Profile



Classification: -

f. OracleHR-Employee
g. Majales-Member
h. Health-Academy-Trainee

### 3.4 Dm Profile Structure:

The structure of dm profile master data consists of all the similar data set from different data source as follows. More than one record for the same beneficiary from different sources.

| #No. | Column Name | Description |
|---|---|---|
| 1 | Hash_Column | Hash column for the table |
| 2 | Data_From | Mumaris+/E-Services/Training/ Matching/One45/HR/Majales/Health Academy |
| 3 | System_Id | PK of source table |
| 4 | Identity_Number | National Id |
| 5 | Profile_Id | Profile Id |
| 6 | Profile_Link | Describe source data from |
| 7 | Full_Name_En | Full name of beneficiary in Latin |
| 8 | Full_Name_Ar | Full name of beneficiary in Arabic |
| 9 | Mobile_Number | Mobile Number |
| 10 | Email | Email |
| 11 | Birth_Date | Date of Birth |
| 12 | Gender_Code | Gender Code |
| 13 | Gender_Name_En | Gender Name in Latin |
| 14 | Gender_Name_Ar | Gender Name in Arabic |
| 15 | Nationality_Code | Nationality Code |
| 16 | Nationality_En | Nationality Name in Latin |
| 17 | Nationality_Ar | Nationality Name in Arabic |
| 18 | Nationality_Type_En | Nationality Type in Latin |
| 19 | Nationality_Type_Ar | Nationality Type in Arabic |
| 20 | Speciality_Id | Speciality Code |
| 21 | Speciality_Name_En | Speciality Name in Latin |
| 22 | Speciality_Name_Ar | Speciality Name in Arabic |
| 23 | Medical_Field_Id | Medical Field Code |
| 24 | Medical_Field_Ar | Medical Field Name in Latin |
| 25 | Medical_Field_En | Medical Field Name in Arabic |
| 26 | University_Id | University Code |
| 27 | University_Name_En | University Name in Latin |
| 28 | University_Name_Ar | University Name in Arabic |
| 29 | College_Id | College Code |
| 30 | College_Name_En | College Name in Latin |
| 31 | College_Name_Ar | College Name in Arabic |
| 32 | Other_University_Name | Other University Name |
| 33 | University_Branch_Id | University Branch Code |
| 34 | University_Branch_Name_Ar | University Branch Name in Latin |
| 35 | University_Branch_Name_En | University Branch Name in Arabic |
| 36 | Graduation_Year | Graduation Year |

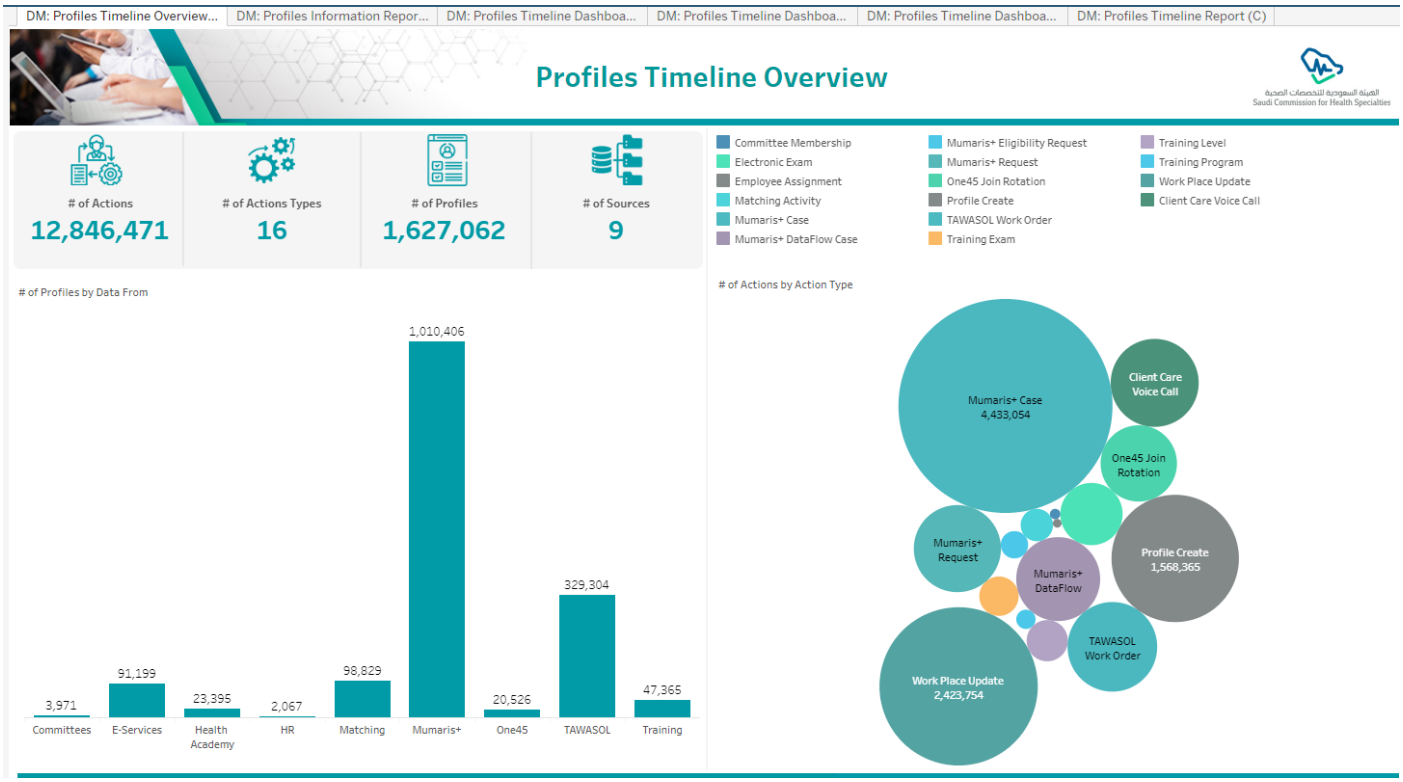


Classification: -

| | | |
|---|---|---|
| 37 | Dwh_Id | Exam source ID |
| 38 | Loading_Date | Data of Last Refresh |
| 39 | Profile_Priority | Priority based on trust order |
| 40 | Profile_Column_Name | Data source table and column name |
| 41 | Profile_Status | Practitioner current registration status |
| 42 | Profile_Create_Date | Profile Creation Date |

The following dashboard describe about name of the source system where the beneficiary data are extracted to keep all beneficiary data.

In this case we have around 9 applications where the data is extracted.






Classification: -

### 3.5 Unique Profile Structure:

Only one golden records from dm profile to treat as master records.

The structure of golden master data are as follows:

| #No. | Column Name | Description |
|---|---|---|
| 1 | Hash_Column | Hash column for the table |
| 2 | Data_From | Mumaris+/E-Services/Training/ Matching/One45 |
| 3 | System_Id | PK |
| 4 | Identity_Number | National Id |
| 5 | Profile_Id | Profile Id |
| 6 | Profile_Link | Data Source |
| 7 | Full_Name_En | Full name of practitioners in Latin |
| 8 | Full_Name_Ar | Full name of practitioners in Arabic |
| 9 | Mobile_Number | Mobile Number |
| 10 | Email | Email |
| 11 | Birth_Date | Date of Birth |
| 12 | Gender_Code | Gender Code |
| 13 | Gender_Name_En | Gender Name in Latin |
| 14 | Gender_Name_Ar | Gender Name in Arabic |
| 15 | Nationality_Code | Nationality Code |
| 16 | Nationality_En | Nationality Name in Latin |
| 17 | Nationality_Ar | Nationality Name in Arabic |
| 18 | Nationality_Type_En | Nationality Type in Latin |
| 19 | Nationality_Type_Ar | Nationality Type in Arabic |
| 20 | Speciality_Id | Speciality Code |
| 21 | Speciality_Name_En | Speciality Name in Latin |
| 22 | Speciality_Name_Ar | Speciality Name in Arabic |
| 23 | Medicalfield_Code | Medical Field Code |
| 24 | Medicalfield_Ar | Medical Field Name in Latin |
| 25 | Medicalfield_En | Medical Field Name in Arabic |
| 26 | Universityid | University Code |
| 27 | University_Name_En | University Name in Latin |
| 28 | University_Name_Ar | University Name in Arabic |
| 29 | College_Id | College Code |
| 30 | College_Name_En | College Name in Latin |
| 31 | College_Name_Ar | College Name in Arabic |
| 32 | Other_University_Name | Other University Name |
| 33 | University_Branch_Id | University Branch Code |
| 34 | University_Branch_Name_Ar | University Branch Name in Latin |
| 35 | University_Branch_Name_En | University Branch Name in Arabic |



Classification: -

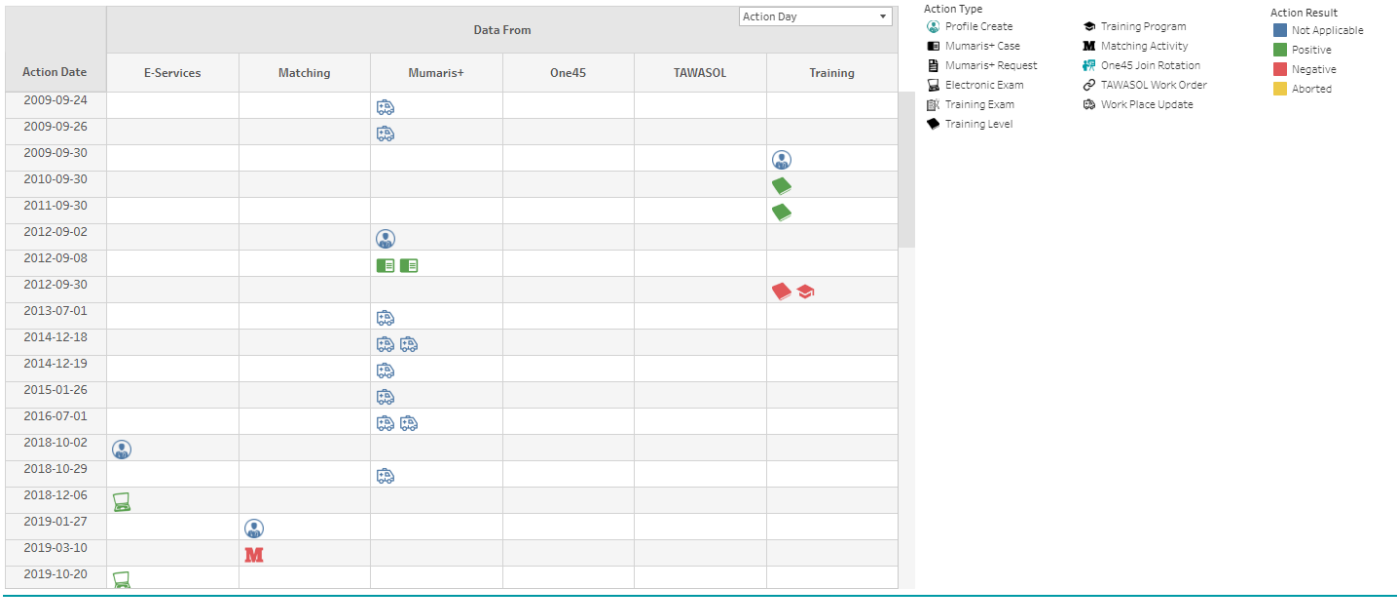
| | | |
|---|---|---|
| 36 | Graduation_Year | Graduation Year |
| 37 | Loading_Date | Data of Last Refresh |
| 38 | Profile_Column_Name | Data source table and column name |
| 39 | Profile_Status | Practitioner current registration status |
| 40 | Profile_Create_Date | Profile Creation Date |

## 3.6 Profile Timeline Structure:

Keep all beneficiary transaction data collect from different sources; this would describe the journey of beneficiary how he travel so far over the period in SCFHS.

**Profile Timeline chat:**

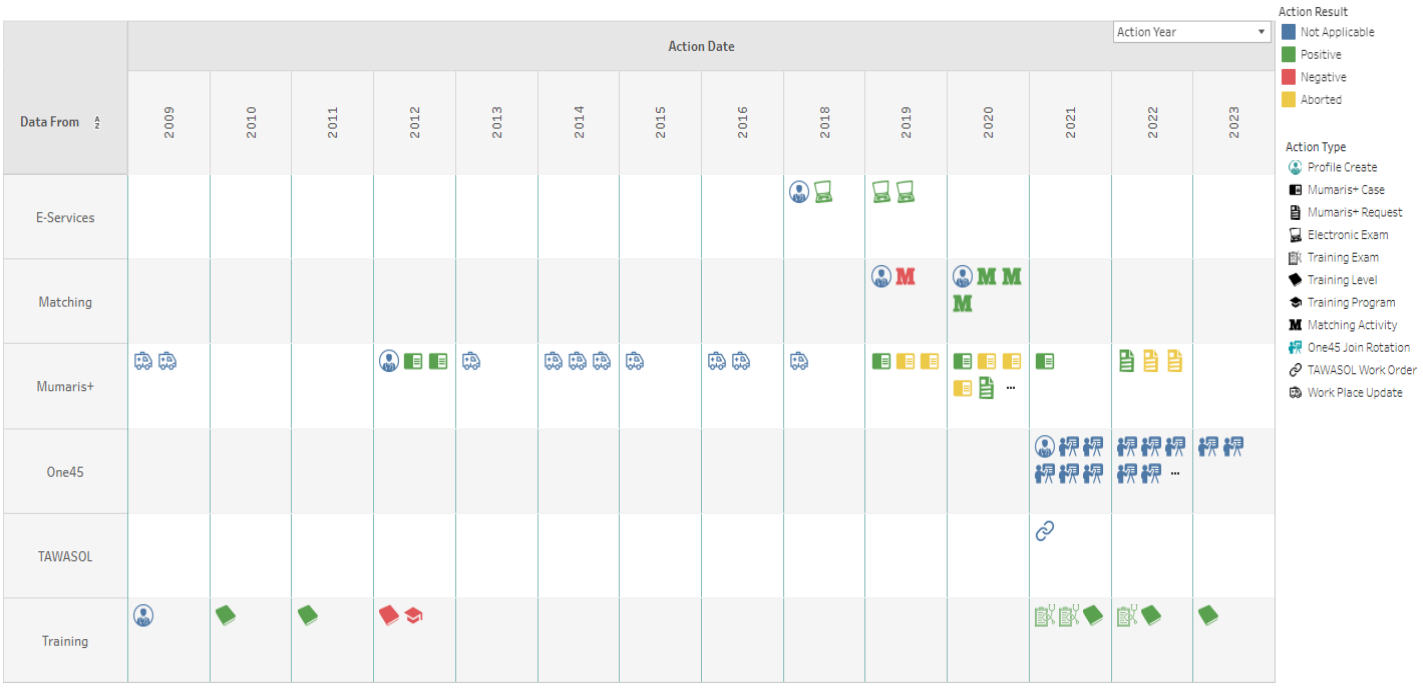
This dashboard describe the journey of beneficiary



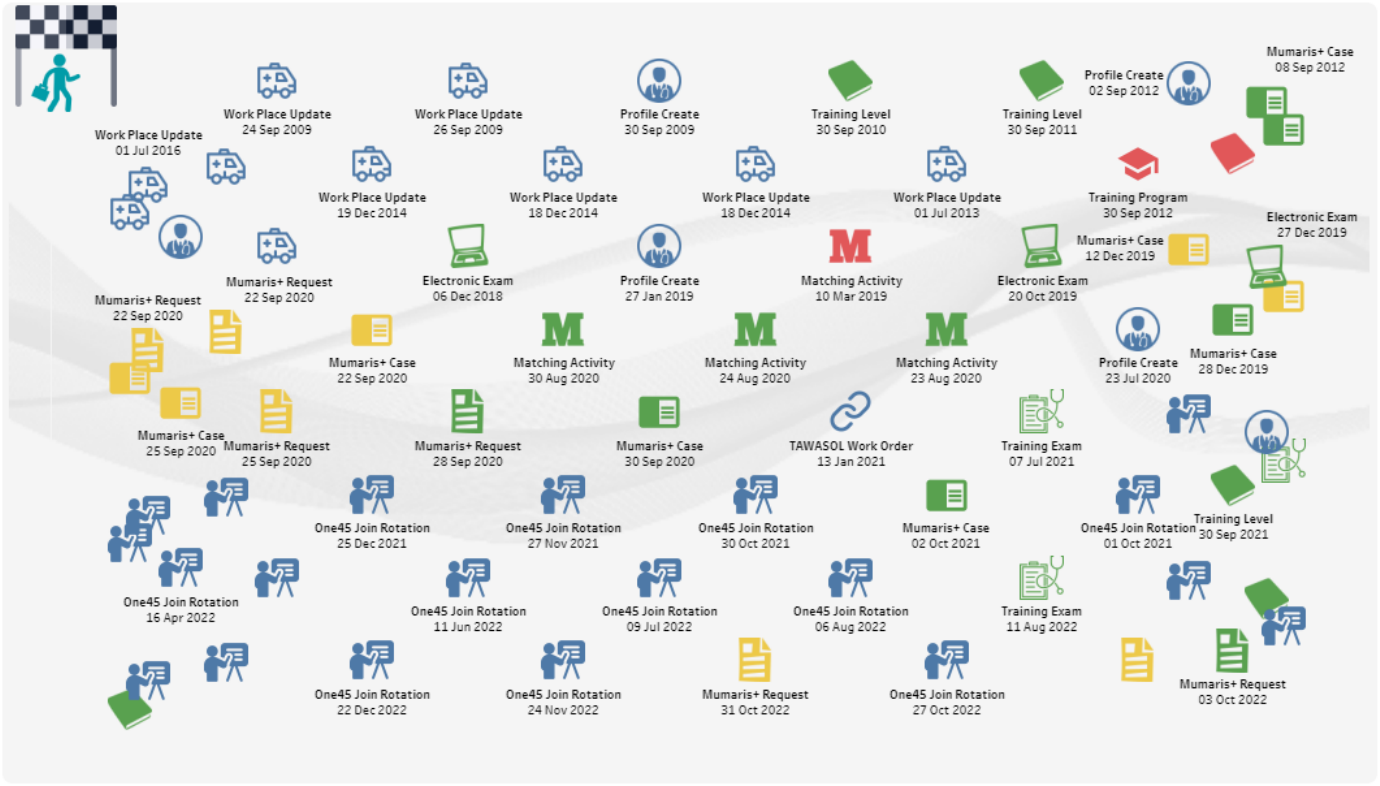

**Contd.,**



Classification: -




**Contd.,**






Classification: -

# 4- RMD Conceptual Architecture

A conceptual reference model defines the terms and concepts used by the enterprise and the communities and business stakeholders in which the enterprise operates. Other strategic, operational, and architectural assets reference it as a way to federate and pivot between different processes, communities, schemas, and systems without coupling them together.

The conceptual reference model approach takes enterprise vocabularies and enterprise data models to a new level that enables federation and integration capabilities to be partially automated and validated

SCFHS follows centralized reference data model for an entire organization level data gathered from internal and external.

## 4.1 Components of Reference Data Model:

Components of RDM are Data source, Hub and Consume Applications.

**Data Source**:- SCFHS has more than 100 data sources from various applications which contains Reference and Master data. Some of the Data sources are listed as follows:

- Mumaris Plus
- Training
- Matching for Residency
- Matching for Fellowship
- HA Matching
- One45
- Tawasol
- HR
- Health Academy
- Portal
- Majales
- Supporting Service

**Data Hub**:- Data hub keeps all the data sources available at SCFHS organization in HUB layer and even from external data received from MOE, MCS and HRSD.

The EDW has all the reference and master data entity which is consolidated from different sources and cleansed and reliable source for dashboard and other applications.

Some of the Reference entity are :

- Country
- City
- Speciality



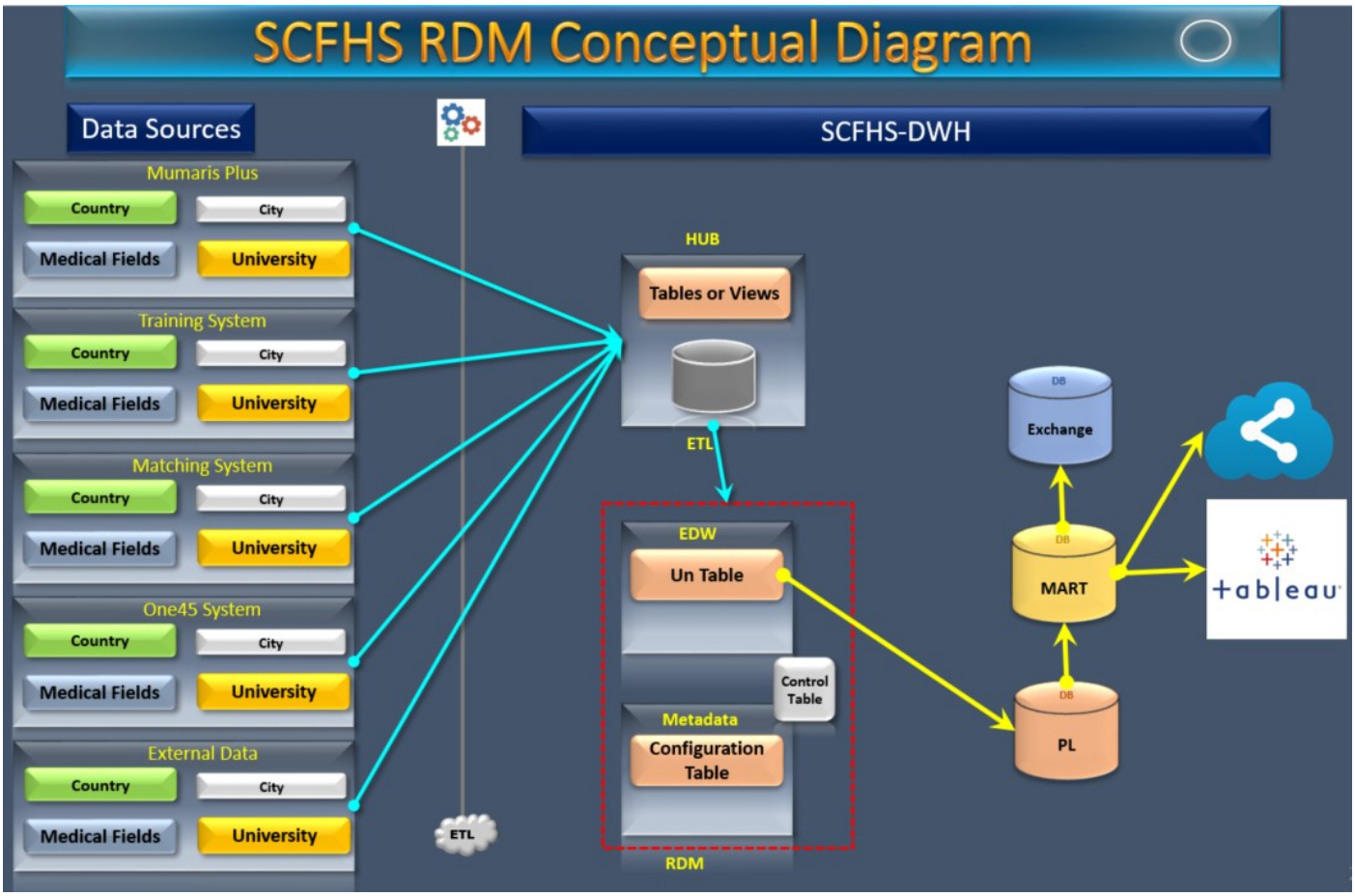
Classification: -

- University
- Exam
- Training Center
- Medical Fields
- Organization Units
- Region

## 4.2 Reference and Master Data Conceptual Model:

Conceptual model shows how the different data source are flow from HUB to EDW to PL and Mart.

Finally the dashboard, Exchange and data sharing are get benefitted from RDM.






Classification: -