

CONCEPTUAL DESIGN AND IMPLEMENTATION OF A DATAWAREHOUSE/MART SYSTEM

CASE STUDY: NORTH-WEST YORKSHIRE ELDERLY SOCIAL & HEALTHCARE

AUTHOR: Victoria Chika Atasie

INTRODUCTION

The aim of this case study of the North and West Yorkshire Elderly and Social Health Care System report is to implement a centralized database solution that would assist in providing a solution that is associated with the integration of data from the West Yorkshire and North Yorkshire health and social care datasets whilst implementing the Extract, Transform and Load (ETL) processes and maintenance. To develop a comprehensive and real time view of bed occupancy rate which is considered the key performance indicator and optimizing the bed resources to meet patient's needs, create a data mart/data warehouse and enable the business owner who is the stakeholder in making a better data driven decision in providing quality care, improve the business reputation and the effectiveness of care homes.

See the detailed case study, all evidence codes, screenshot of codes running successfully would be in the Appendix.

DISCLAIMER: The data used for this case study project has been anonymized to ensure no individual's identity can be determined. All sensitive and personal identifiable information has been removed in accordance with data privacy law and ethical guidelines. This project is for educational and informational purposes. Any resemblance to real persons or organizations is purely coincidental. The analysis presented is based on information available at the time of writing.

PROPOSED CENTRALIZED DATABASE SOLUTION, AIMS AND OBJECTIVES

As a BI Consultant, I would be implementing a centralized database solution that would help resolve the problem in integrating data from West Yorkshire and North Yorkshire health and social care datasets whilst combining the bed occupancy data from both care homes. The Aim would create a comprehensive and real time view of the bed occupancy rate and considering the bed resources optimization allocation to meet patient's needs and assist the business owner in making better data driven decision in the provision of quality care, enhance their business, reputation and increased

demand for care home services. **The Main Aim** is to understand dimensions in a star schema and fact table which would aid in indicating how data can be handled from multiple sources of data.

Objectives: The objective would support the optimization and utilization of beds leading to high bed occupancy rates and minimizing the possible bed vacancy.

Improve Quality of Care whilst maintaining bed occupancy in care homes

Effective costing in managing resource allocation with the bed occupancy rate whilst reducing expenses.

Enhancing patients' satisfaction whilst creating positive satisfaction and long-term occupancy.

STAKEHOLDER

The stakeholder for the project would be **North Yorkshire and West Yorkshire Care Homes Business Owner**. These are owners of the care homes and run the overall business strategy and are the people who require a data warehouse to be implemented and help them in better decision-making.

The relevant business question that would be answered for the business owner or investor to aid the implementation of the proposed centralized database solution would include:

- Does the bed occupancy rate vary from West Yorkshire and North Yorkshire Care homes per year
- What is the bed occupancy rate in West Yorkshire and North Yorkshire Care homes per year?
- What are the trends and patterns in the bed occupancy in the West Yorkshire and North Yorkshire Care homes?

STRATEGY, EXTERNAL AND INTERNAL BUSINESS DRIVERS

The Strategy would assist in the implementation of the centralized database solution by integrating the health and social care data in the optimization of the bed occupancy whilst enhancing the quality of care provided as a business and creating a real time system of the bed occupancy rates and give insight for an informed decision making.

The external business driver could involve meeting up the business intelligence solution to the standard compliance requirements and regulation in the health and social care data privacy for the data integration.

The internal business driver could involve maintaining a high level of bed occupancy rate for revenue generated growth as more of available bed can lead to financial losses to the business owners whilst aiming at using the data insight to a better decision making.

Short/long term strategy: The short term may involve improving decision making and optimizing bed occupancy whilst implementing centralized database solution and integrating data.

The Long-term strategy would enhance the possibility of maintaining high bed occupancy rates leading to the success of the business for health and care homes.

KEY PERFORMANCE INDICATOR

The key performance indicator is **Bed Occupancy Rate**. This would help in setting the right indicator in terms of performance and give insight into what is measurable and contribute to decision making.

REPORTS

The stated reports would help in tracking and meet the expected Key performance indicators.

The reports required to support business questions would involve measures such as

The Percentage of Bed occupancy in the North Yorkshire and West Yorkshire Care Homes per year?

What is the Total number of Bed Occupied for 2023 per North Yorkshire and West Yorkshire Care Homes?

The Total number of Available Bed per month per year in the North Yorkshire and West Yorkshire Care Homes?

?

The Total number of Bed Available per year in the North Yorkshire and West Yorkshire Care Homes?

?

The relevant business question that would be answered for the business owner to aid the implementation of the proposed centralized database solution would include:

-Does the bed occupancy rate vary from West Yorkshire and North Yorkshire Care homes per year?

- What is the bed occupancy rate in West Yorkshire and North Yorkshire Care homes per year?
- What are the trends and patterns in the bed occupancy in the West Yorkshire and North Yorkshire Care homes?

DATA WAREHOUSE ARCHITECTURE, TECHNOLOGY, METHODOLOGY, AND IMPLEMENTATION.

The architecture for this case study would be the Three-tier Architecture and Dependent Datamart would be created. The data sources would be derived from North Yorkshire and West Yorkshire datasets, the data derived from these sources would be extracted, transformed and loaded (ETL) which would involve data integration, data cleaning and checking the data quality and consistency into the DataMart. In Datamart the data integrated would be stored for which can be used for analysis leading to generating reports for the Business Owner.

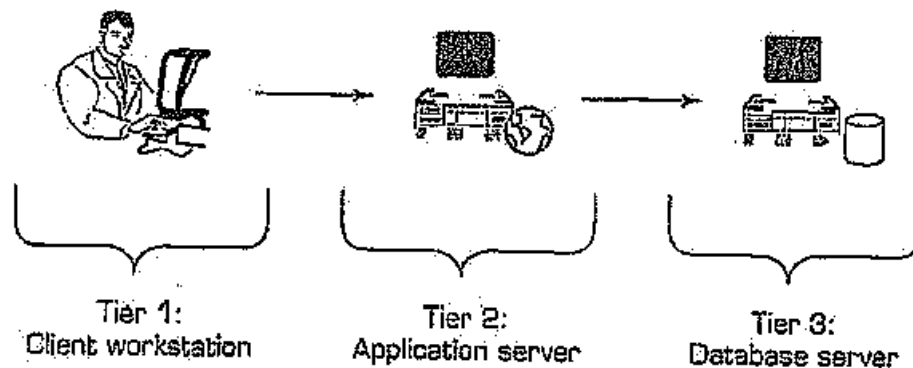


Figure 1: Three Tier Architecture Data Warehouse (Source: From Decision Support and Business Intelligence System - Efraim Turban 2011)

Operational systems in the three tier involves software for data acquisition and data in one tier which can be referred to as the server, the data warehouse forms another tier and the third tier includes the application server and the client(Efraim

Turban). The data are processed twice and placed in the multi-dimensional database from the warehouse which makes it easy for multidimensional presentation and analysis and can be repeated in the data mart.

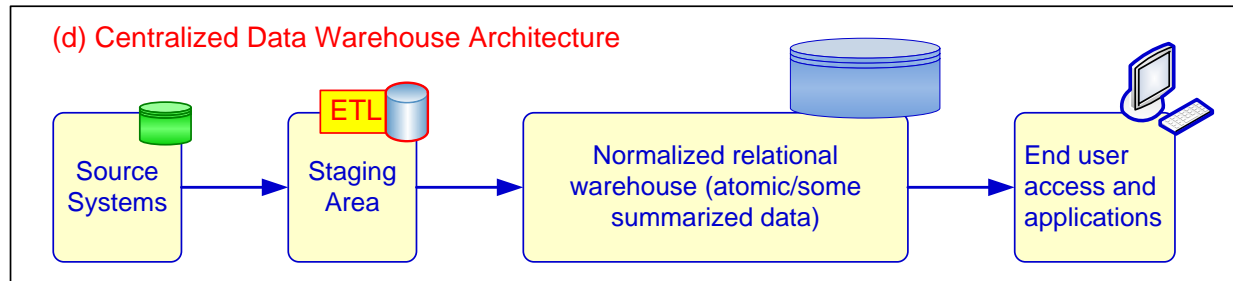


Figure 2: Centralized Data Warehouse Architecture (Source: The DW Design and Architecture Slides)

TECHNOLOGY

The technology that can be used are various Database Management System such as Oracle, Microsoft SQL Server which can be used for the storage of data, Business Intelligence tools such as Tableau for data visualization to the business owner.

METHODOLOGY

The methodology for the software development life cycle would include the Planning Phase where the requirement, objectives and scope would be initiated, Gather the data from the data sources which would be Analysis phase, consider the architecture to be used in the Design phase, perform the extraction, transformation and loading processes and ensuring data quality checks and accuracy, performance would be tested in Testing phase, conduct implementation for the Deployment phase and maintenance would be established.

IMPLEMENTATION

The implementation approach would include the Extraction from the data sources, Transformed and Loaded into the DataMart. Data accuracy would be considered, performing data cleaning and consistency to enable analysis and reporting.

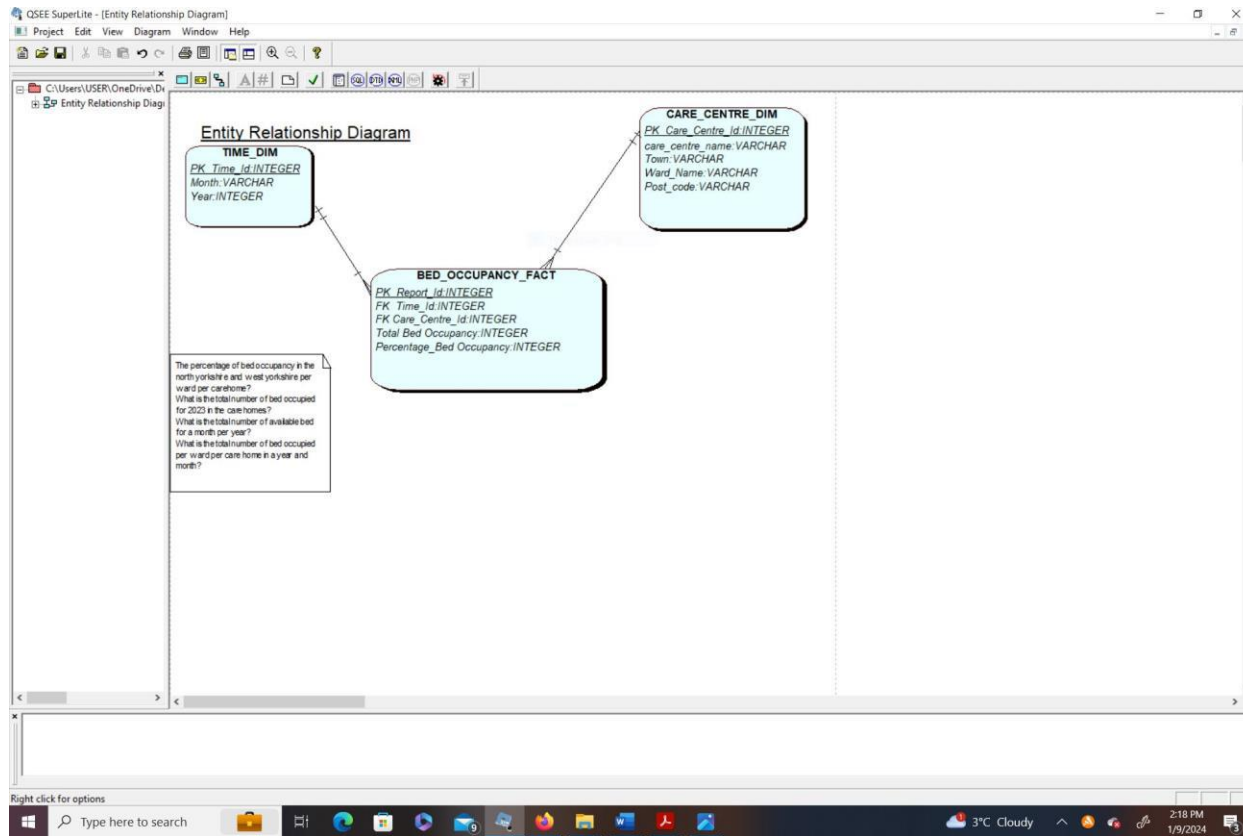
MAINTENANCE

The maintenance for centralized database solution of this case study would include constant data updating, queries monitoring for better performance, the data integration to ensure data accuracy ,monitoring the ensuring errors are resolved in the DataMart, providing adequate communication with business owner as the stakeholder and providing updates of reports ,data security would be implemented, ensure easy access for the business owner or other users and ensuring the Datamart or Datawarehouse capacity for future voluminous data.

STAR SCHEMA AND DATA DICTIONARY

Star schema involves dimensional design for relational database are categorized as columns of the dimension table whilst the fact table contains facts that are stored as columns (Christopher Adams ,2010)

The star schema for the decision support system for supporting the key performance indicator comprises of the Time Dimension, the bed occupancy fact, the care center dimension, and the measures. The aggregated measures would be used to provide reports and querying of its data.



SOURCE 1: WYR_CARE CENTRE (care_Id, **Care_centre_name**, address, **postcode**, **town**, email)

WYR_Bed (ward_no, bed_no, **bed_status**)

WYR_RESERVATION (Reservation_Id, **Admission_Date**)

WYR_Bed Assigned(reservation_Id,bed_no)

WYR_WARD (**WARD_NO**, **WARD_NAME**, **CARE_ID**)

SOURCE 2: NYR_CARE CENTRE (care_centre_Id, **Care_centre_name**, address, **postcode**, **town**, email)

NYR_BED (bed_id, **bed_status**, ward_id, bed_type)

NYR_ADMISSION (Admission_no ,**Admission_date**)

NYR_WARD (**WARD_ID**, **WARD_NAME**, **CARE_CENTRE_ID**)

The lowest level of granularity for each Dimension is as follows:

Time Dimension:(Time_Id,Month,Year)The Time_Id would be the lowest level of granularity

Care_Centre Dimension:(Care_Centre_Id,Care_Centre_Name,Postcode,Town)The Care_Centre_Id would be the lowest level of granularity.

DATA DICTIONARY DOCUMENTED

SS Definitions				Mapping/ Data Source			
Dimension	Attribute Name	Data Type	Key	Data Sources	Data Sources Type	Definition:	Notes
Time_Dim	time_id	NUMBER	Primary	none	NUMBER	time_id_SEQ This is the unique Identifier of time, e.g. 1, 2, 3,	This is a surrogate key, that will be populated through Sequence, generated at the staging area.
	Month	NUMBER	No	Admission_Date	DATE	This is the Month extracted from data source columns, populated in time dimension as January, March, April, November	Data would be pulled from two tables, making sure there are no duplicates
	Year	NUMBER	No	AdmissionDate	DATE	This is the Year extracted from data source columns, populated in time dimension as 2022, 2023	Data would be pulled from two tables, making sure there are no duplicates
Care_Centre_Dim	<u>Care_Centre_id</u>	NUMBER	Primary	Care_Centre_Id	NUMBER	This is the unique Identifier of the care_centre_Id e.g., 1, 2, 3	Will pull in data from two tables (WYR&NYR), and ensure

							there are no duplicates
	Care_centre_name	VARCHAR	None	Care_centre_name	VARCHAR	This is the name of the care centre to be used e.g Oscar Care home, Wellbeing	Will pull in data from two tables, and ensure there are no duplicates
	Address	VARCHAR	None	Address	VARCHAR	This would be the address of the care_centre e.g. Meifod Isaf Cottage	Will pull in data from two tables, and ensure there no duplicates

	Town	VARCHAR	None	Town	VARCHAR	This would be the town description of the care_centre	Will pull in data from two tables, and ensure there no duplicates
	Postcode	VARCHAR	None	Postcode	VARCHAR	This would be the postcode description of the care_centre	Will pull in data from two tables, and ensure there no duplicates
Bed_Occupancy_Fact	<u>Report_Id</u>	NUMBER	Primary	Report_SEQ	NUMBER	This is the unique identifier of Bed_Occupancy_fact table, e.g. 1, 2, 3...	This is a Surrogate key, that will be populated through Sequence
	Time_Id	NUMBER	Foreign Key	Time_dim.time_id	NUMBER	The values are linked to measure and Time_Dim, 1, 2, 3	This is the foreign key in the fact table.
	Care_Centre_Id	NUMBER	Foreign Key	Care_Centre_Dim, Care_Centre_Id	NUMBER	The values here are linked to measure and Care_Centre_Dim, 1, 2, 3	This is the foreign key in the fact table.
	Percentage of bed occupancy rate	NUMBER	None	This is a Measure so might require temporary tables to hold dates while working out	NUMBER	pseudocode: Occupied Bed divided by Total Bed Multiply by 100	Measure of the percentage of bed occupancy for the report, e.g. 60%
	Total number of bed occupancy	NUMBER	None	This is a Measure so might require temporary	NUMBER	Count(*) where Bed_satus	Measure of the number of Bed

				tables to hold data with calculation		=Occupied and Year =2023	occupied e.g. 45,
	Total number of available bed	NUMBER	None	This is a Measure so might require temporary tables to hold data with calculation	NUMBER	Pseudocode: Count(*) where bed_status = Available and Month=November_	Measure of available bed per Month, Year

EXTRACT, TRANSFORM AND LOAD DATA DICTIONARY

Extract, Transform and Load is the process of data moving from one system to another which can also include integration, presentations and movement of data (Christopher Adams 2010). Extract, Load and Transform (ETL) processes are important in the component of data integration which enables data to be extracted and transformed from various sources of data to a final location referred to as a data mart or data warehouse. Data from its sources would possibly have “inconsistence and redundancies” which is required to be solved to enable an organisation to have a collective view of their data (Calvanese, D.et al,2001).

Extract					Transform			Load			
Database Source (s)	Field Attribute	Data Type	Key	Table Name	Data Quality Check	Data quality Issues	Action Note	SS table	SS Column/Data Type	Key	Notes
Definition:	Care_Centre_name represents the names of various care homes in the NYR AND WYR Care_Centre.										
Notes:	Care_Centre_name columns exist in both data sources										
NYR_TABLE	Care_centre_name	Varcha r	No	NYR_Care_Ce ntre Table	Consist ency	None	None	Care_Centre_Dim	Care_Centr e Id /NUMBER	PK	Primary key extract from NYR And WYR Care_Centr introduced i the staging area.
WYR_TABLE		Varcha r	No	WYR_Care_Centre Table	Consist ency	None	None	Care_Centre_Dim	Care_centre _name /VARCHAR		Insert value from the staging area table values from tables NYR And

											WYR Care_Centr
Definition:	Post Code represent the location of the Carehomes in NYR and WYR Care Centre										
Notes:	Post Code exists in both data sources.							SS Table	SS Column/Da ta Type	Key	Notes
NYR_TAB LE	Postcode	Varcha r	No	NYR_Care_Ce ntre Table	Consist ency	None	None	Care_Centre_Dim	Care_Centr e_Id /NUMBER		Primary key extract from NYR And WYR Care_Centr introduced i the staging area.
WYR_TA BLE		Varcha r	No	WYR_Care_C entre_Table	Consist ency	None	None	Care_Centre_Dim	Postcode/Va rchar		Insert value from the staging area table NYR And WYR Care_Centr

Definition:	Town represent the location of the Care homes in NYR and WYR Care Centre.									
Notes:	Town column exists in both data sources.							SS Table	SS Column/Data Type	Key
NYR_TABLE	Town	Varchar	No	NYR_Care_Centre Table	Consistency	None	None	Care_Centre_Dim	Care_Centre_Id/NUMBER	
WYR_TABLE		Varchar	No	WYR_Care_Centre_Table	Consistency	None	None	Care_Centre_Dim	Town/Varchar	

Definition:	Bed status represents the bed occupied or bed available in the care homes of NYR and WYR Care Centre.										
Notes:	Bed status column exist in both data sources.							SS Table	SS Column/Data Type	Key	Notes
NYR_TABLE	Bed_Status	Varchar	No	NYR_Bed	Consistency	None	None	Bed_Occupancy_Fact	Report_Id/NUMBER	Surrogate Key	Surrogate key is populated using sequence which is introduced in the staging area.
WYR_TABLE		Varchar	No	WYR_Bed	Consistency	None	None	Bed_Occupancy_Fact	Percentage_Bed_Occupancy_rate/Number Total Number of Bed/Number Total Number of Available Bed per Month/Number Total Number of bed available per Year/Number		The bed status is used as the attribute in calculating the measure from the fact table.
Definition:	Bed status represents the bed occupied or bed available in the care homes of NYR and WYR Care Centre.										

Notes:	Bed status column exist in both data sources.							SS Table	SS Column/Data Type	Key	Notes
NYR_TABLE	Bed_Status	Varchar	No	NYR_Bed	Consistency	None	None	Bed_Occupancy_Fact	Report_Id/NUMBER	Surrogate Key	Surrogate key is populated using sequence which is introduced in the staging area.
WYR_TABLE		Varchar	No	WYR_Bed	Consistency	None	None	Bed_Occupancy_Fact	Percentage_Bed_Occupancy_rate/Number Total Number of Bed/Number Total Number of Available Bed per Month/Number Total Number of bed available per Year/Number		The bed status is used as the attribute in calculating the measure from the fact table.
Definition:	Admission_Date represents the admission date when patient is admitted leading to the bed occupied determined.										
Notes:	Admission_Date columns exist in both data sources.							SS Table	SS Column/Data Type	Key	Notes

NYR_TABLE	Admission_Date	Date	No	NYR_Admission Table	Consistency	NYR_Admission data format differs from WYR_Reservation data format.	Extract Year and Month from admission date column from NYR_Admission	Time_Dim	Time_Id/NUMBER	Surrogate Key	Surrogate key is populated using sequence which is introduced in the staging area.
									Month/Varchar Year/Number		

WYR_TABLE		Date	No	WYR_Reservation Table	Inconsistency	Missing Values of the Admission Date in the WYR_Table	Extract Year and Month from admission date column in the WYR_Reservation.	Time_Dim	Month/Varchar Year/Number		Insert value from the staging area table NYR_Admission And WYR_Reservation and cleaned and transformed.
-----------	--	------	----	-----------------------	---------------	---	---	----------	------------------------------	--	---

SAMPLE DATA FOR STAR SCHEMA TABLE

EXCEL FOR NORTH AND WEST WAREHO...																		
Search																		
File Layout Formulas Data Review View Automate Help Power Pivot																		
<div> <div>11 A A</div> <div> <div>Font</div> <div>Alignment</div> <div>Number</div> <div>Styles</div> <div>Cells</div> <div>Editing</div> </div> <div> <div>Conditional Formatting</div> <div>Format as Table</div> <div>Cell Styles</div> <div>Insert</div> <div>Delete</div> <div>Format</div> </div> <div> <div>AutoSum</div> <div>Fill</div> <div>Clear</div> <div>Sort & Filter</div> <div>Find & Select</div> </div> <div> <div>Comments</div> <div>Share</div> </div> </div>																		
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		

Figure 3: EXCEL SAMPLE DATA

DATA INTEGRATION(ETL)AND MAINTENANCE

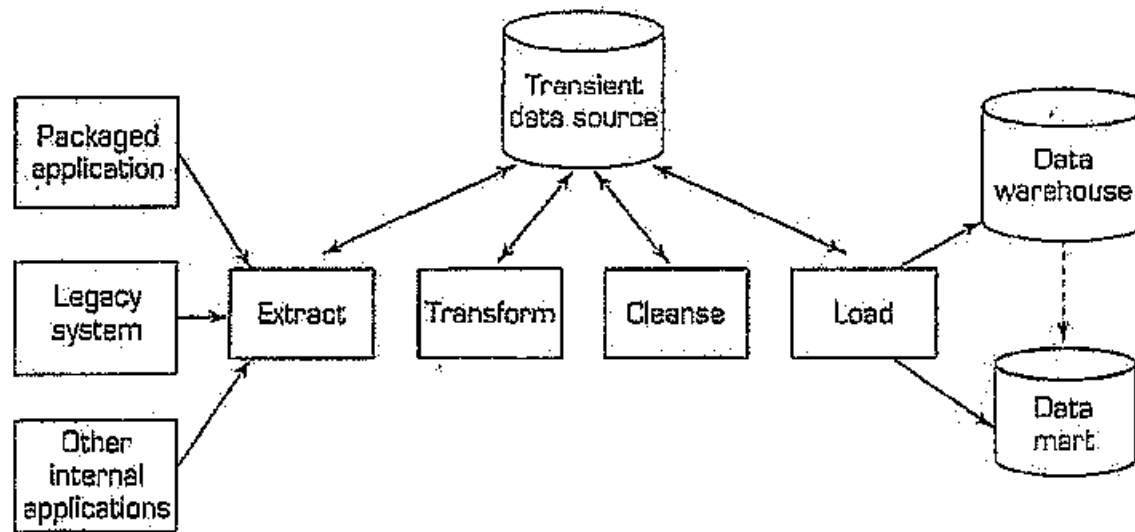
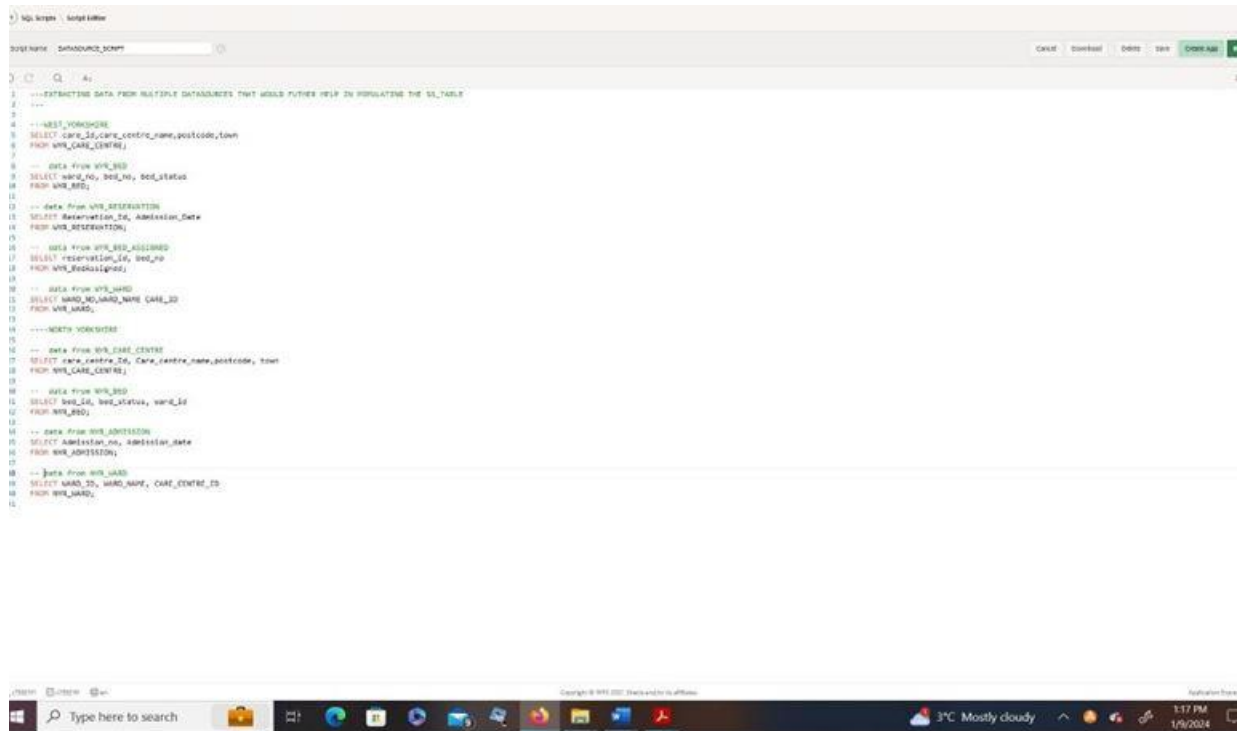


Figure 4: ETL PROCESS:(Source: From Decision Support and Business Intelligence System -Efraim Turban,2011)

Original data sets that are used for star schema includes the table and columns highlighted and would be used in the staging area. This phase of the ETL process involved the extraction of data from the West Yorkshire and North Yorkshire datasets as a multiple source of data which would help contribute to the analytical report process.

In this screenshot below I explore the data for the West Yorkshire and North Yorkshire data using SELECT, FROM STATEMENT to have a view of data for extraction process.



```
1  ---EXTRACTING DATA FROM MULTIPLE DATASOURCES THAT WOULD FURTHER HELP IN POPULATING THE ST_TABLE
2  ---
3
4  --WEST YORKSHIRE
5  SELECT care_id,care_centre_name,postcode,town
6  FROM WH_CARE_CENTRE;
7
8  --- DATA FROM WH_BED
9  SELECT ward_no, bed_no, bed_status
10 FROM WH_BED;
11
12 -- DATA FROM WH_RESERVATION
13 SELECT Reservation_Id, Admission_Date
14 FROM WH_RESERVATION;
15
16 -- DATA FROM WH_BED_ASSIGNED
17 SELECT reservation_id, bed_no
18 FROM WH_BedAssigned;
19
20 -- DATA FROM WH_WARD
21 SELECT ward_no,ward_name, care_id
22 FROM WH_WARD;
23
24 ---NORTH YORKSHIRE
25
26 -- DATA FROM NH_CARE_CENTRE
27 SELECT care_centre_id, Care_centre_name,postcode, town
28 FROM NH_CARE_CENTRE;
29
30 -- DATA FROM NH_BED
31 SELECT bed_id, bed_status, ward_id
32 FROM NH_BED;
33
34 -- DATA FROM NH_ADMISSION
35 SELECT Admission_no, Admission_date
36 FROM NH_ADMISSION;
37
38 -- DATA FROM NH_WARD
39 SELECT ward_no, ward_name, care_centre_id
40 FROM NH_WARD;
```


STAR SCHEMA IMPLEMENTATION

Star schema includes dimensional design for relational database are categorized as columns of the dimension table and the fact table contains facts that are stored as columns (Christopher Adams ,2010). A data warehouse design involves the conceptualization of dimensional modelling, and a dimensional modelling is the “retrieval-based system” which allows a huge amount of query accessibility. The fact table contains the features required for analytical process for decision, foreign keys are connected to the dimensional tables and attributes are used for querying a report (Turban, E., 2011).

The star schema above was designed, and I proceeded to forward engineer my star schema and implemented sequence for my surrogate key. The measures in the Bed_Occupancy_Fact table would be percentage of bed occupied which would be drilled down to per ward per care centre and total bed occupied per ward per care centre. The evidence code would be showed alongside the Load process below.

The Time_Dim contains the Time_Id Month and Year and the Care_centre_Dim contains the Care_centre_Id, care_centre_name, town, ward_name and post_code.

STAGING AREA

The staging area approach was implemented as V1_staging_area to serve as an intermediate stage of combining the data extracted from multiple sources before the load process in the star schema.

```
Script name: v1_STAGING_AREAS
Cancel Download Edit View Check All Run

1  ---Created a v1_STAGING_AREAS BY SELECTING THE COLUMNS THAT I NEED ,SET ALIAS AND USED SCHEM
2  ---ALTERED THE v1_STAGING_AREAS AND IDENTIFIED THE DATASOURCE ,THEN INSERTED THE NEW COLUMNS TO ENABLE ME MERGE THE DATA
3
4  -----STAGING AREA
5  ---CREATE TABLE myres_data AS
6  DROP TABLE v1_STAGING_AREAS CASCADE CONSTRAINTS;
7
8  CREATE TABLE v1_STAGING_AREAS AS
9  SELECT
10     myr_c.centre_name AS centre_name,
11     myr_c.centre_id AS centre_id,
12     myr_c.postcode AS postcode,
13     myr_c.town AS town,
14     myr_bas.bas_status AS bas_status,
15     myr_ward.ward_name AS ward_name,
16     myr_res.admission_date AS admission_date
17 FROM
18     myr_c CENTRE myr_c
19 JOIN
20     myr_bas myr_bas ON myr_c.centre_id = myr_bas.centre_id
21 JOIN
22     myr_ward myr_ward ON myr_bas.bas_id = myr_ward.bas_id
23 JOIN
24     myr_res myr_res ON myr_ward.ward_id = myr_res.ward_id
25 (SELECT Reservation_id FROM myr_bookingsignup WHERE bas_id = myr_bas.bas_id);
26
27 ALTER TABLE v1_STAGING_AREAS
28 ADD DATASOURCE VARCHAR(255);
29
30 UPDATE v1_STAGING_AREAS
31 SET DATASOURCE = 'myr';
32
33 -- COMBINING THE TABLES
34
35 INSERT INTO v1_STAGING_AREAS
36 SELECT
37     myr_c.centre_name AS centre_name,
38     myr_c.centre_id AS centre_id,
39     myr_c.postcode AS postcode,
40     myr_c.town AS town,
41     myr_bas.bas_status AS bas_status,
42     myr_ward.ward_name AS ward_name,
43     myr_res.admission_date AS admission_date,
44     'myr'
45 FROM
46     myr_c CENTRE myr_c
47 JOIN
48     myr_bas myr_bas ON myr_c.centre_id = myr_bas.centre_id
49 JOIN
50     myr_ward myr_ward ON myr_bas.bas_id = myr_ward.bas_id
51 JOIN
52     myr_res myr_res ON myr_ward.ward_id = myr_res.ward_id
53 (SELECT Reservation_id FROM myr_bookingsignup WHERE bas_id = myr_bas.bas_id);
54
55 -- SELECT * FROM v1_STAGING_AREAS
```

ID	CARE_CENTRE_NAME	CARE_CENTRE_ID	POSTCODE	TOWN	BED_STATUS	WARD_NAME	ADMISSION_DATE	DATASOURCE	NEW_ADMISSION_DATE
1	Uthmaniyah	1	134 889	Leeds	AVAILABLE	GENERAL WARD	08-APR-23 12:00:00.000000000 AM	W18	04/09/2023
1	Uthmaniyah	1	134 889	Leeds	OCCUPIED	GENERAL WARD	08-APR-23 12:00:00.000000000 AM	W18	04/09/2023
1	Uthmaniyah	1	134 889	Leeds	OCCUPIED	GENERAL WARD	08-APR-23 12:00:00.000000000 AM	W18	04/09/2023
1	Uthmaniyah	1	134 889	Leeds	OCCUPIED	GENERAL WARD	08-APR-23 12:00:00.000000000 AM	W18	04/09/2023
1	Uthmaniyah	1	134 889	Leeds	AVAILABLE	GENERAL WARD	08-APR-23 12:00:00.000000000 AM	W18	04/09/2023
1	Uthmaniyah	1	134 889	Leeds	OCCUPIED	GENERAL WARD	08-APR-23 12:00:00.000000000 AM	W18	04/09/2023
1	Uthmaniyah	1	134 889	Leeds	OCCUPIED	GENERAL WARD	08-APR-23 12:00:00.000000000 AM	W18	04/09/2023
1	Uthmaniyah	1	134 889	Leeds	OCCUPIED	GENERAL WARD	08-APR-23 12:00:00.000000000 AM	W18	04/09/2023
1	Uthmaniyah	1	134 889	Leeds	OCCUPIED	GENERAL WARD	08-APR-23 12:00:00.000000000 AM	W18	04/09/2023
1	Uthmaniyah	1	134 889	Leeds	OCCUPIED	GENERAL WARD	08-APR-23 12:00:00.000000000 AM	W18	04/09/2023

Further discussion, the V1_staging_area was created and selected columns care_centre_name, centre_centre_id, postcode, town, bed_status, ward_name, admission_date and used a JOIN based on the relationship between the tables, altered and updated with a datasource and perform an insert and select statement into the V1_staging area.

ALTER TABLE V1_STAGING_AREA ADD NEW_ADMISSION_DATE DATE; This was used to add a new_admission_date column considering the format of the initial admission_date column by separating the date and time using the code below.

UPDATE V1_STAGING_AREA

SET NEW_ADMISSION_DATE = TO_DATE(TO_CHAR(ADMISSION_DATE, 'DD-MON-YY'), 'DD-MON-YY');

TRANSFORMATION, QUALITY CHECKS AND TEMPORAL TABLE

The transformation involves data undergoing cleaning, data validation, normalization, ensuring accuracy and consistency of data to avoid data quality issues and maintain data integrity.

Further discussion, missing data was checked using SELECT *

```
FROM V1_STAGING_AREA WHERE CARE_CENTRE_NAME IS NULL OR POSTCODE IS NULL OR TOWN IS NULL  
OR BED_STATUS IS NULL OR WARD_NAME IS NULL OR ADMISSION_DATE IS NULL.
```

The Admission_date appeared that there were missing values and other showed no missing values.

DELETE FROM V1_STAGING_AREA **WHERE** ADMISSION_DATE **IS NULL**; was used to delete null values.

-- Code was used in checking for Duplicates values

```
--SELECT CARE_CENTRE_NAME, CARE_CENTRE_ID, POSTCODE,  
TOWN, BED_STATUS, WARD_NAME, ADMISSION_DATE, COUNT(*)  
--FROM V1_STAGING_AREA  
--GROUP BY CARE_CENTRE_NAME,  
CARE_CENTRE_ID, POSTCODE, TOWN, BED_STATUS, WARD_NAME, ADMISSION_DATE  
--HAVING COUNT(*) > 1;
```

Consistency of data was checked such as :

Checking for Consistency in BED_STATUS

```
--SELECT DISTINCT BED_STATUS  
--FROM V1_STAGING_AREA;
```

-- Check for Consistency in WARD_NAME

```
--SELECT DISTINCT WARD_NAME  
--FROM V1_STAGING_AREA;
```

---Quality checks were also done, updating bed status for integrity, standardizations and all lowercase occupied to uppercase occupied

```
UPDATE V1_STAGING_AREA  
SET BED_STATUS = 'OCCUPIED'  
WHERE UPPER(BED_STATUS) = 'OCCUPIED' OR BED_STATUS = 'Occupied';
```

----Updated rows with 'NOT OCCUPIED' to 'Available'

```
UPDATE V1_STAGING_AREA
```

```
SET BED_STATUS = 'AVAILABLE'  
WHERE UPPER(BED_STATUS) = 'NOT OCCUPIED';  
-----Updated lowercase 'Available' to 'AVAILABLE'  
UPDATE V1_STAGING_AREA  
SET BED_STATUS = 'AVAILABLE'  
WHERE UPPER(BED_STATUS) = 'AVAILABLE' OR BED_STATUS = 'Available';
```

```
UPDATE V1_STAGING_AREA  
SET WARD_NAME = 'GENERAL WARD'  
WHERE UPPER(WARD_NAME) = 'GENERAL CARE';
```

An ETL log was created to log in changes made in the data, created a trigger and

```
NEW_ETL_LOG
```

```
SQL Scripts | Script Editor
Script Name: v1_staging_area_ets_log

Cancel Download Delete Save Create Log Run

1
2
3 -- Position v1_staging_area
4 -- SQL
5 DROP table new_ets_log cascade constraints;
6
7 CREATE TABLE new_ets_log
8 (issue_id NUMBER(1) NOT NULL,
9 table_name VARCHAR(255),
10 data_error_code VARCHAR(255),
11 issue_desc VARCHAR(255),
12 issue_date DATE,
13 issue_status VARCHAR(255),
14 status_update_date DATE);
15
16 Drop sequence NEW_ETL_SEQ;
17 create sequence NEW_ETL_SEQ
18 start with 1
19 increment by 1
20 maxvalue 10000
21 minvalue 1;
22
23
24
25 -- DROP TRIGGER v1_staging_area_v1_log_quality_chk;
26
27
28 CREATE OR REPLACE trigger v1_log_quality_chk
29 before update on v1_staging_area
30 for each row
31 begin
32 INSERT INTO NEW_ETL_LOG
33 (issue_id, table_name, data_error_code, issue_desc, issue_date, issue_status, status_update_date)
34 VALUES
35 (NEW_ETL_SEQ.nextval, 'v1_staging_area', 'P', 'Quality check', SYSDATE, 'complete', SYSDATE);
36 end;
37
38 -- DATA QUALITY CHECKS/DATA INTEGRITY
39
40 --SELECT * FROM v1_staging_area;
```

Object Explorer

Schema: CTSDWH

NEW_STL_LOG

ID#	ISSUE_ID	TABLE_NAME	DATA_SOURCE_CODE	ISSUE_DESC	ISSUE_DATE	ISSUE_STATUS	STATUS_CHANGE_DATE
43		V1_STAGING_AREA	0	Quality checks	01/05/2024	completed	01/05/2024
44		V1_STAGING_AREA	0	Quality checks	01/05/2024	completed	01/05/2024
45		V1_STAGING_AREA	0	Quality checks	01/05/2024	completed	01/05/2024
46		V1_STAGING_AREA	0	Quality checks	01/05/2024	completed	01/05/2024
47		V1_STAGING_AREA	0	Quality checks	01/05/2024	completed	01/05/2024
48		V1_STAGING_AREA	0	Quality checks	01/05/2024	completed	01/05/2024
49		V1_STAGING_AREA	0	Quality checks	01/05/2024	completed	01/05/2024
50		V1_STAGING_AREA	0	Quality checks	01/05/2024	completed	01/05/2024
51		V1_STAGING_AREA	0	Quality checks	01/05/2024	completed	01/05/2024
52		V1_STAGING_AREA	0	Quality checks	01/05/2024	completed	01/05/2024
53		V1_STAGING_AREA	0	Quality checks	01/05/2024	completed	01/05/2024
54		V1_STAGING_AREA	0	Quality checks	01/05/2024	completed	01/05/2024

Download

rows: 1 - 13 of 81 Rows

Copyright © 2008-2023 Oracle and/or its affiliates. All rights reserved. Application Express 21.3

Transformation was done on the New_Admission_Date to extract Month and Year into separate columns and created a V2_Staging_Area .

Signature	QUALIFY_CHECK_V2_FLAGS
00000000000000000000000000000000	0
00000000000000000000000000000001	1
00000000000000000000000000000002	2
00000000000000000000000000000003	3
00000000000000000000000000000004	4
00000000000000000000000000000005	5
00000000000000000000000000000006	6
00000000000000000000000000000007	7
00000000000000000000000000000008	8
00000000000000000000000000000009	9
0000000000000000000000000000000A	10
0000000000000000000000000000000B	11
0000000000000000000000000000000C	12
0000000000000000000000000000000D	13
0000000000000000000000000000000E	14
0000000000000000000000000000000F	15
00000000000000000000000000000010	16
00000000000000000000000000000011	17
00000000000000000000000000000012	18
00000000000000000000000000000013	19
00000000000000000000000000000014	20
00000000000000000000000000000015	21
00000000000000000000000000000016	22
00000000000000000000000000000017	23
00000000000000000000000000000018	24
00000000000000000000000000000019	25
0000000000000000000000000000001A	26
0000000000000000000000000000001B	27
0000000000000000000000000000001C	28
0000000000000000000000000000001D	29
0000000000000000000000000000001E	30
0000000000000000000000000000001F	31
00000000000000000000000000000020	32
00000000000000000000000000000021	33
00000000000000000000000000000022	34
00000000000000000000000000000023	35
00000000000000000000000000000024	36
00000000000000000000000000000025	37
00000000000000000000000000000026	38
00000000000000000000000000000027	39
00000000000000000000000000000028	40
00000000000000000000000000000029	41
0000000000000000000000000000002A	42
0000000000000000000000000000002B	43
0000000000000000000000000000002C	44
0000000000000000000000000000002D	45
0000000000000000000000000000002E	46
0000000000000000000000000000002F	47
00000000000000000000000000000030	48
00000000000000000000000000000031	49
00000000000000000000000000000032	50
00000000000000000000000000000033	51
00000000000000000000000000000034	52
00000000000000000000000000000035	53
00000000000000000000000000000036	54
00000000000000000000000000000037	55
00000000000000000000000000000038	56
00000000000000000000000000000039	57
0000000000000000000000000000003A	58
0000000000000000000000000000003B	59
0000000000000000000000000000003C	60
0000000000000000000000000000003D	61
0000000000000000000000000000003E	62
0000000000000000000000000000003F	63
00000000000000000000000000000040	64
00000000000000000000000000000041	65
00000000000000000000000000000042	66
00000000000000000000000000000043	67
00000000000000000000000000000044	68
00000000000000000000000000000045	69
00000000000000000000000000000046	70
00000000000000000000000000000047	71
00000000000000000000000000000048	72
00000000000000000000000000000049	73
0000000000000000000000000000004A	74
0000000000000000000000000000004B	75
0000000000000000000000000000004	

Cancel	Download	Order	Save	Credit App	Go
--------	----------	-------	------	------------	----

```

-- Data Transformation
76 CREATE TABLE VL_STAGING_AREA AS
77 SELECT
78     CARD_CENTER_NAME,
79     CARD_CENTER_ID,
80     POSCODE,
81     TOWN,
82     EXTRACT(YEAR FROM NEW_ADMISSION_DATE) AS YEAR,
83     TO_CHAR(NEW_ADMISSION_DATE, 'MM') AS MONTH,
84     REG_STATUS,
85     WARD_NAME,
86     DATASOURCE
87 FROM VL_STAGING_AREA)
88
89 INSERT INTO VL_STAGING_AREA SELECT
90     CARD_CENTER_NAME,
91     CARD_CENTER_ID,
92     POSCODE,
93     TOWN,
94     EXTRACT(YEAR FROM NEW_ADMISSION_DATE) AS YEAR,
95     TO_CHAR(NEW_ADMISSION_DATE, 'MM') AS MONTH,
96     REG_STATUS,
97     WARD_NAME,
98     DATASOURCE
99 FROM VL_STAGING_AREA
100 WHERE EXTRACT(YEAR FROM NEW_ADMISSION_DATE) = 2021 AND TO_CHAR(NEW_ADMISSION_DATE, 'MM') = '01';
101
102 INSERT INTO VL_STAGING_AREA SELECT
103     CARD_CENTER_NAME,
104     CARD_CENTER_ID,
105     POSCODE,
106     TOWN,
107     EXTRACT(YEAR FROM NEW_ADMISSION_DATE) AS YEAR,
108     TO_CHAR(NEW_ADMISSION_DATE, 'MM') AS MONTH,
109     REG_STATUS,
110     WARD_NAME,
111     DATASOURCE
112 FROM VL_STAGING_AREA
113 WHERE EXTRACT(YEAR FROM NEW_ADMISSION_DATE) = 2021 AND TO_CHAR(NEW_ADMISSION_DATE, 'MM') = '02';
114
115 INSERT INTO VL_STAGING_AREA SELECT
116     CARD_CENTER_NAME,
117     CARD_CENTER_ID,
118     POSCODE,
119     TOWN,
120     EXTRACT(YEAR FROM NEW_ADMISSION_DATE) AS YEAR,
121     TO_CHAR(NEW_ADMISSION_DATE, 'MM') AS MONTH,
122     REG_STATUS,
123     WARD_NAME,
124     DATASOURCE
125 FROM VL_STAGING_AREA
126 WHERE EXTRACT(YEAR FROM NEW_ADMISSION_DATE) = 2021 AND TO_CHAR(NEW_ADMISSION_DATE, 'MM') = '03';
127
128 INSERT INTO VL_STAGING_AREA SELECT
129     CARD_CENTER_NAME,
130     CARD_CENTER_ID,
131     POSCODE,
132     TOWN,
133     EXTRACT(YEAR FROM NEW_ADMISSION_DATE) AS YEAR,
134     TO_CHAR(NEW_ADMISSION_DATE, 'MM') AS MONTH,
135     REG_STATUS,
136     WARD_NAME,
137     DATASOURCE
138 FROM VL_STAGING_AREA
139 WHERE EXTRACT(YEAR FROM NEW_ADMISSION_DATE) = 2021 AND TO_CHAR(NEW_ADMISSION_DATE, 'MM') = '04';
140
141 INSERT INTO VL_STAGING_AREA SELECT
142     CARD_CENTER_NAME,
143     CARD_CENTER_ID,
144     POSCODE,
145     TOWN,
146     EXTRACT(YEAR FROM NEW_ADMISSION_DATE) AS YEAR,
147     TO_CHAR(NEW_ADMISSION_DATE, 'MM') AS MONTH,
148     REG_STATUS,
149     WARD_NAME,
150     DATASOURCE
151 FROM VL_STAGING_AREA
152 WHERE EXTRACT(YEAR FROM NEW_ADMISSION_DATE) = 2021 AND TO_CHAR(NEW_ADMISSION_DATE, 'MM') = '05';
153
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200
201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261
262
263
264
265
266
267
268
269
270
271
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
288
289
290
291
292
293
294
295
296
297
298
299
300
301
302
303
304
305
306
307
308
309
310
311
312
313
314
315
316
317
318
319
320
321
322
323
324
325
326
327
328
329
330
331
332
333
334
335
336
337
338
339
340
341
342
343
344
345
346
347
348
349
350
351
352
353
354
355
356
357
358
359
360
361
362
363
364
365
366
367
368
369
370
371
372
373
374
375
376
377
378
379
380
381
382
383
384
385
386
387
388
389
390
391
392
393
394
395
396
397
398
399
400
401
402
403
404
405
406
407
408
409
410
411
412
413
414
415
416
417
418
419
420
421
422
423
424
425
426
427
428
429
430
431
432
433
434
435
436
437
438
439
440
441
442
443
444
445
446
447
448
449
450
451
452
453
454
455
456
457
458
459
460
461
462
463
464
465
466
467
468
469
470
471
472
473
474
475
476
477
478
479
480
481
482
483
484
485
486
487
488
489
490
491
492
493
494
495
496
497
498
499
500
501
502
503
504
505
506
507
508
509
510
511
512
513
514
515
516
517
518
519
520
521
522
523
524
525
526
527
528
529
530
531
532
533
534
535
536
537
538
539
540
541
542
543
544
545
546
547
548
549
550
551
552
553
554
555
556
557
558
559
560
561
562
563
564
565
566
567
568
569
570
571
572
573
574
575
576
577
578
579
580
581
582
583
584
585
586
587
588
589
590
591
592
593
594
595
596
597
598
599
600
601
602
603
604
605
606
607
608
609
610
611
612
613
614
615
616
617
618
619
620
621
622
623
624
625
626
627
628
629
630
631
632
633
634
635
636
637
638
639
640
641
642
643
644
645
646
647
648
649
650
651
652
653
654
655
656
657
658
659
660
661
662
663
664
665
666
667
668
669
670
671
672
673
674
675
676
677
678
679
680
681
682
683
684
685
686
687
688
689
690
691
692
693
694
695
696
697
698
699
700
701
702
703
704
705
706
707
708
709
710
711
712
713
714
715
716
717
718
719
720
721
722
723
724
725
726
727
728
729
730
731
732
733
734
735
736
737
738
739
740
741
742
743
744
745
746
747
748
749
750
751
752
753
754
755
756
757
758
759
760
761
762
763
764
765
766
767
768
769
770
771
772
773
774
775
776
777
778
779
780
781
782
783
784
785
786
787
788
789
790
791
792
793
794
795
796
797
798
799
800
801
802
803
804
805
806
807
808
809
810
811
812
813
814
815
816
817
818
819
820
821
822
823
824
825
826
827
828
829
830
831
832
833
834
835
836
837
838
839
840
841
842
843
844
845
846
847
848
849
850
851
852
853
854
855
856
857
858
859
860
861
862
863
864
865
866
867
868
869
870
871
872
873
874
875
876
877
878
879
880
881
882
883
884
885
886
887
888
889
890
891
892
893
894
895
896
897
898
899
900
901
902
903
904
905
906
907
908
909
910
911
912
913
914
915
916
917
918
919
920
921
922
923
924
925
926
927
928
929
930
931
932
933
934
935
936
937
938
939
9
```

1. **Introduction**
 2. **Background**
 3. **Methodology**
 4. **Results**
 5. **Discussion**
 6. **Conclusion**
 7. **References**
 8. **Appendix**
 9. **Figure 1**
 10. **Figure 2**
 11. **Figure 3**
 12. **Figure 4**
 13. **Figure 5**
 14. **Figure 6**
 15. **Figure 7**
 16. **Figure 8**
 17. **Figure 9**
 18. **Figure 10**
 19. **Figure 11**
 20. **Figure 12**
 21. **Figure 13**
 22. **Figure 14**
 23. **Figure 15**
 24. **Figure 16**
 25. **Figure 17**
 26. **Figure 18**
 27. **Figure 19**
 28. **Figure 20**
 29. **Figure 21**
 30. **Figure 22**
 31. **Figure 23**
 32. **Figure 24**
 33. **Figure 25**
 34. **Figure 26**
 35. **Figure 27**
 36. **Figure 28**
 37. **Figure 29**
 38. **Figure 30**
 39. **Figure 31**
 40. **Figure 32**
 41. **Figure 33**
 42. **Figure 34**
 43. **Figure 35**
 44. **Figure 36**
 45. **Figure 37**
 46. **Figure 38**
 47. **Figure 39**
 48. **Figure 40**
 49. **Figure 41**
 50. **Figure 42**
 51. **Figure 43**
 52. **Figure 44**
 53. **Figure 45**
 54. **Figure 46**
 55. **Figure 47**
 56. **Figure 48**
 57. **Figure 49**
 58. **Figure 50**
 59. **Figure 51**
 60. **Figure 52**
 61. **Figure 53**
 62. **Figure 54**
 63. **Figure 55**
 64. **Figure 56**
 65. **Figure 57**
 66. **Figure 58**
 67. **Figure 59**
 68. **Figure 60**
 69. **Figure 61**
 70. **Figure 62**
 71. **Figure 63**
 72. **Figure 64**
 73. **Figure 65**
 74. **Figure 66**
 75. **Figure 67**
 76. **Figure 68**
 77. **Figure 69**
 78. **Figure 70**
 79. **Figure 71**
 80. **Figure 72**
 81. **Figure 73**
 82. **Figure 74**
 83. **Figure 75**
 84. **Figure 76**
 85. **Figure 77**
 86. **Figure 78**
 87. **Figure 79**
 88. **Figure 80**
 89. **Figure 81**
 90. **Figure 82**
 91. **Figure 83**
 92. **Figure 84**
 93. **Figure 85**
 94. **Figure 86**
 95. **Figure 87**
 96. **Figure 88**
 97. **Figure 89**
 98. **Figure 90**
 99. **Figure 91**
 100. **Figure 92**
 101. **Figure 93**
 102. **Figure 94**
 103. **Figure 95**
 104. **Figure 96**
 105. **Figure 97**
 106. **Figure 98**
 107. **Figure 99**
 108. **Figure 100**
 109. **Figure 101**
 110. **Figure 102**
 111. **Figure 103**
 112. **Figure 104**
 113. **Figure 105**
 114. **Figure 106**
 115. **Figure 107**
 116. **Figure 108**
 117. **Figure 109**
 118. **Figure 110**
 119. **Figure 111**
 120. **Figure 112**
 121. **Figure 113**
 122. **Figure 114**
 123. **Figure 115**
 124. **Figure 116**
 125. **Figure 117**
 126. **Figure 118**
 127. **Figure 119**
 128. **Figure 120**
 129. **Figure 121**
 130. **Figure 122**
 131. **Figure 123**
 132. **Figure 124**
 133. **Figure 125**
 134. **Figure 126**
 135. **Figure 127**
 136. **Figure 128**
 137. **Figure 129**
 138. **Figure 130**
 139. **Figure 131**
 140. **Figure 132**
 141. **Figure 133**
 142. **Figure 134**
 143. **Figure 135**
 144. **Figure 136**
 145. **Figure 137**
 146. **Figure 138**
 147. **Figure 139**
 148. **Figure 140**
 149. **Figure 141**
 150. **Figure 142**
 151. **Figure 143**
 152. **Figure 144**
 153. **Figure 145**
 154. **Figure 146**
 155. **Figure 147**
 156. **Figure 148**
 157. **Figure 149**
 158. **Figure 150**
 159. **Figure 151**
 160. **Figure 152**
 161. **Figure 153**
 162. **Figure 154**
 163. **Figure 155**
 164. **Figure 156**
 165. **Figure 157**
 166. **Figure 158**
 167. **Figure 159**
 168. **Figure 160**
 169. **Figure 161**
 170. **Figure 162**
 171. **Figure 163**
 172. **Figure 164**
 173. **Figure 165**
 174. **Figure 166**
 175. **Figure 167**
 176. **Figure 168**
 177. **Figure 169**
 178. **Figure 170**
 179. **Figure 171**
 180. **Figure 172**
 181. **Figure 173**
 182. **Figure 174**
 183. **Figure 175**
 184. **Figure 176**
 185. **Figure 177**
 186. **Figure 178**
 187. **Figure 179**
 188. **Figure 180**
 189. **Figure 181**
 190. **Figure 182**
 191. **Figure 183**
 192. **Figure 184**
 193. **Figure 185**
 194. **Figure 186**
 195. **Figure 187**
 196. **Figure 188**
 197. **Figure 189**
 198. **Figure 190**
 199. **Figure 191**
 200. **Figure 192**
 201. **Figure 193**
 202. **Figure 194**
 203. **Figure 195**
 204. **Figure 196**
 205. **Figure 197**
 206. **Figure 198**
 207. **Figure 199**
 208. **Figure 200**
 209. **Figure 201**
 210. **Figure 202**
 211. **Figure 203**
 212. **Figure 204**
 213. **Figure 205**
 214. **Figure 206**
 215. **Figure 207**
 216. **Figure 208**
 217. **Figure 209**

[Lecture 1](#)
[Lecture 2](#)
[Lecture 3](#)

Copyright © 2009, 2011, Oracle and/or its affiliates.

Multiple Choice



Table: **V1_STAGING_AREA**

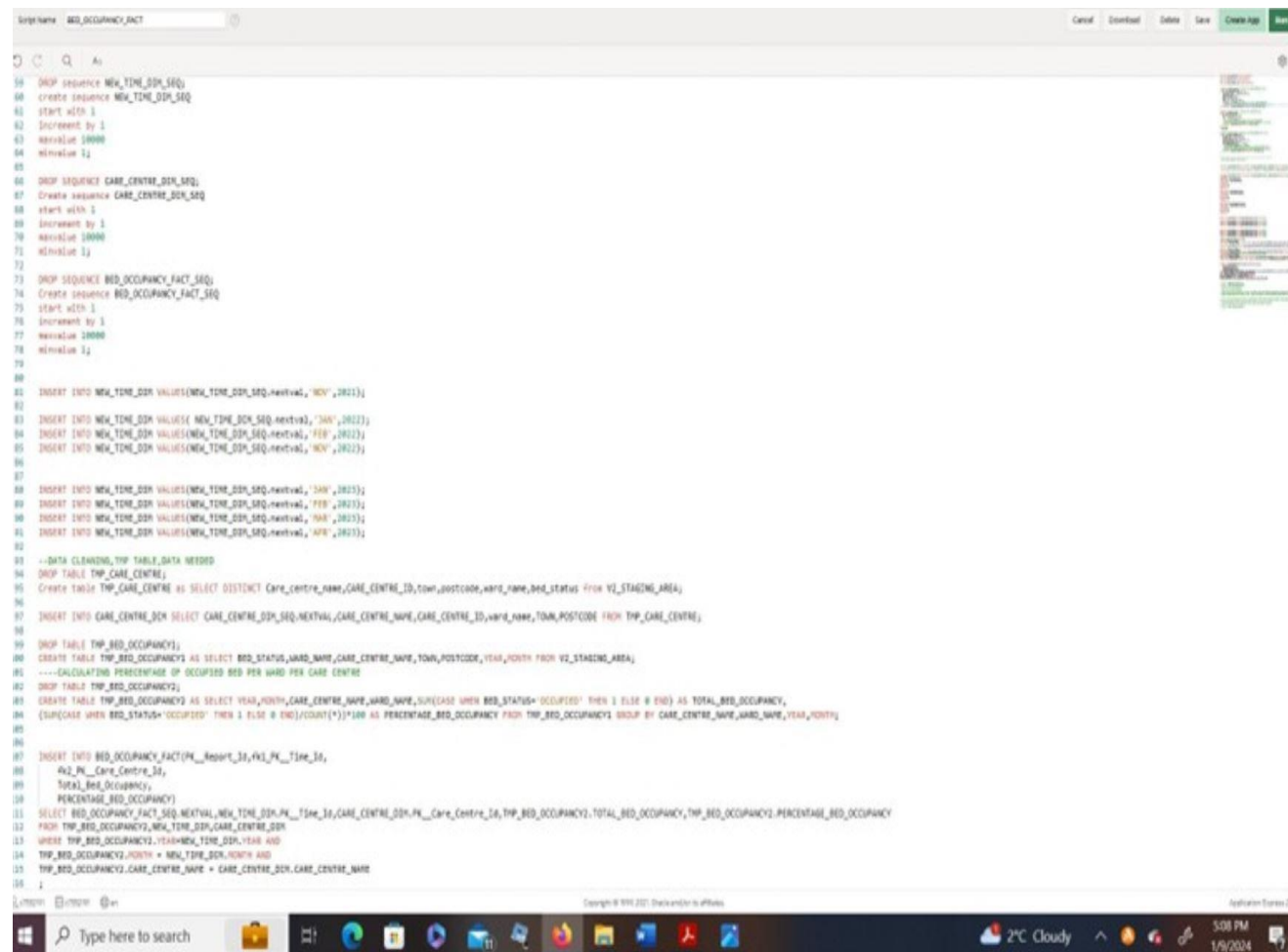
Columns: [Columns](#) [Insert](#) [Connectivity](#) [Queries](#) [Statistics](#) [SQL Database](#) [Triggers](#) [Dependencies](#) [SQL](#) [DDL](#) [Sample Queries](#)

Query: [Query](#) [Insert Data](#) [Insert Data](#) [Load Data](#)

ID	CARD_COUNTER_NAME	CARD_COUNTER_ID	POINTCLOCK	ZONE	YEAR	MONTH	WEEK_STATUS	WEEK_NAME	DATE/TIME
1	100-Cardzone	1	100-000	1000	2023	000	AVAILABLE	GENERAL WEEK	0000
2	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
3	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
4	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
5	100-Cardzone	1	100-000	1000	2023	000	AVAILABLE	GENERAL WEEK	0000
6	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
7	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
8	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
9	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
10	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
11	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
12	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
13	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
14	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
15	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
16	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
17	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
18	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
19	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
20	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
21	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
22	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
23	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
24	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
25	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
26	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
27	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
28	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
29	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
30	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
31	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
32	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
33	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
34	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
35	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
36	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
37	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
38	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
39	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
40	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
41	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
42	100-Cardzone	1	100-000	1000	2023	000	OCCUPIED	GENERAL WEEK	0000
43	1								

LOADING AND TEMPORAL TABLE

The loading phase of this ETL process would involve populating the dimension table (Time dimension), the fact table (Bed_Occupancy_fact), the surrogate keys are defined, the measures in the fact table would be calculated, sequences created, temporal table would be created, and insertion into the bed_occupancy_fact.



```
ScriptName: BED_OCCUPANCY_FACT

59 DROP SEQUENCE NEW_TIME_SEQ;
60 CREATE SEQUENCE NEW_TIME_SEQ
61 START WITH 1
62 INCREMENT BY 1
63 MINVALUE 10000
64 MAXVALUE 1;
65
66 DROP SEQUENCE CARE_CENTRE_SEQ;
67 CREATE SEQUENCE CARE_CENTRE_SEQ
68 START WITH 1
69 INCREMENT BY 1
70 MINVALUE 10000
71 MAXVALUE 1;
72
73 DROP SEQUENCE BED_OCCUPANCY_FACT_SEQ;
74 CREATE SEQUENCE BED_OCCUPANCY_FACT_SEQ
75 START WITH 1
76 INCREMENT BY 1
77 MINVALUE 10000
78 MAXVALUE 1;
79
80
81 INSERT INTO NEW_TIME_DIM VALUES(NEW_TIME_SEQ.NEXTVAL, 'NOV', 2023);
82
83 INSERT INTO NEW_TIME_DIM VALUES(NEW_TIME_SEQ.NEXTVAL, 'JAN', 2023);
84 INSERT INTO NEW_TIME_DIM VALUES(NEW_TIME_SEQ.NEXTVAL, 'FEB', 2023);
85 INSERT INTO NEW_TIME_DIM VALUES(NEW_TIME_SEQ.NEXTVAL, 'NOV', 2023);
86
87
88 INSERT INTO NEW_TIME_DIM VALUES(NEW_TIME_SEQ.NEXTVAL, 'JAN', 2023);
89 INSERT INTO NEW_TIME_DIM VALUES(NEW_TIME_SEQ.NEXTVAL, 'FEB', 2023);
90 INSERT INTO NEW_TIME_DIM VALUES(NEW_TIME_SEQ.NEXTVAL, 'MAR', 2023);
91 INSERT INTO NEW_TIME_DIM VALUES(NEW_TIME_SEQ.NEXTVAL, 'APR', 2023);
92
93 --DATA CLEANING, TMP TABLE, DATA NEEDED
94 DROP TABLE TMP_CARE_CENTRE;
95 CREATE TABLE TMP_CARE_CENTRE AS SELECT DISTINCT Care_centre_name, CARE_CENTRE_ID, town, postcode, ward_name, bed_status FROM V2_STAGING_AREA;
96
97 INSERT INTO CARE_CENTRE_DIM SELECT CARE_CENTRE_SEQ.NEXTVAL, CARE_CENTRE_NAME, CARE_CENTRE_ID, ward_name, town, postcode FROM TMP_CARE_CENTRE;
98
99
100 DROP TABLE TMP_BED_OCCUPANCY;
101 CREATE TABLE TMP_BED_OCCUPANCY AS SELECT BED_STATUS, WARD_NAME, CARE_CENTRE_WARD, town, postcode, year, month FROM V2_STAGING_AREA;
102
103 -----CALCULATION PERCENTAGE OF OCCUPIED BED PER WARD PER CARE CENTRE
104 DROP TABLE TMP_BED_OCCUPANCY2;
105 CREATE TABLE TMP_BED_OCCUPANCY2 AS SELECT YEAR, MONTH, CARE_CENTRE_WARD, WARD_NAME, SUM(CASE WHEN BED_STATUS = 'OCCUPIED' THEN 1 ELSE 0 END) AS TOTAL_BED_OCCUPANCY,
106 (SUM(CASE WHEN BED_STATUS = 'OCCUPIED' THEN 1 ELSE 0 END)/COUNT(*))*100 AS PERCENTAGE_BED_OCCUPANCY FROM TMP_BED_OCCUPANCY GROUP BY CARE_CENTRE_WARD, WARD_NAME, YEAR, MONTH;
107
108
109 INSERT INTO BED_OCCUPANCY_FACT(FM__Report_ID, FK2_PK__Time_ID,
110 FK2_PK__Care_Centre_ID,
111 Total_Bed_Occupancy,
112 PERCENTAGE_BED_OCCUPANCY)
113 SELECT BED_OCCUPANCY_FACT_SEQ.NEXTVAL, NEW_TIME_DIM_PK__Time_ID, CARE_CENTRE_DIM_PK__Care_Centre_ID, TMP_BED_OCCUPANCY2.TOTAL_BED_OCCUPANCY, TMP_BED_OCCUPANCY2.PERCENTAGE_BED_OCCUPANCY
114 FROM TMP_BED_OCCUPANCY2, NEW_TIME_DIM, CARE_CENTRE_DIM
115 WHERE TMP_BED_OCCUPANCY2.YEAR = NEW_TIME_DIM.YEAR AND
116 TMP_BED_OCCUPANCY2.MONTH = NEW_TIME_DIM.MONTH AND
117 TMP_BED_OCCUPANCY2.CARE_CENTRE_WARD = CARE_CENTRE_DIM.CARE_CENTRE_WARD
118
119
```

```
SQL> CREATE TABLE CARC_CENTRE_DET
1  (
2  -- Create a Database table to represent the "CARC_CENTRE_DET" entity.
3  CARC_CENTRE_DET_ID NUMBER(10) NOT NULL,
4  CARC_CENTRE_NAME VARCHAR2(255) NOT NULL,
5  CARC_CENTRE_ID NUMBER(10) NOT NULL,
6  CARC_NAME VARCHAR2(255),
7  CARC_CODE VARCHAR2(10) NOT NULL,
8  CARC_CODE VARCHAR2(10) NOT NULL,
9  -- Specify the PRIMARY KEY constraint for table "CARC_CENTRE_DET".
10 -- This indicates which attribute(s) uniquely identify each row of data.
11 CONSTRAINT PK_CARC_CENTRE_DET PRIMARY KEY (CARC_CENTRE_ID)
12 );
13
14 -- Create a Database table to represent the "TIME_DET" entity.
15 CREATE TABLE NEW_TIME_DET
16 (
17 TIME_DET_ID NUMBER(10) NOT NULL,
18 TIME_CODE VARCHAR2(10) NOT NULL,
19 TIME_CODE VARCHAR2(10) NOT NULL,
20 -- Specify the PRIMARY KEY constraint for table "TIME_DET".
21 -- This indicates which attribute(s) uniquely identify each row of data.
22 CONSTRAINT PK_NEW_TIME_DET PRIMARY KEY (TIME_DET_ID)
23 );
24
25 -- Create a Database table to represent the "BED_OCCUPANCY_FACT" entity.
26 CREATE TABLE BED_OCCUPANCY_FACT
27 (
28 BED_OCCUPANCY_FACT_ID NUMBER(10) NOT NULL,
29 BED_OCCUPANCY_FACT_CODE VARCHAR2(10) NOT NULL,
30 BED_OCCUPANCY_FACT_CODE VARCHAR2(10) NOT NULL,
31 -- Specify the PRIMARY KEY constraint for table "BED_OCCUPANCY_FACT".
32 -- This indicates which attribute(s) uniquely identify each row of data.
33 CONSTRAINT PK_BED_OCCUPANCY_FACT PRIMARY KEY (BED_OCCUPANCY_FACT_ID)
34 );
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
101
102
103
104
105
106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
129
130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200
201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261
262
263
264
265
266
267
268
269
270
271
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
288
289
290
291
292
293
294
295
296
297
298
299
300
301
302
303
304
305
306
307
308
309
310
311
312
313
314
315
316
317
318
319
320
321
322
323
324
325
326
327
328
329
330
331
332
333
334
335
336
337
338
339
340
341
342
343
344
345
346
347
348
349
350
351
352
353
354
355
356
357
358
359
360
361
362
363
364
365
366
367
368
369
370
371
372
373
374
375
376
377
378
379
380
381
382
383
384
385
386
387
388
389
390
391
392
393
394
395
396
397
398
399
400
401
402
403
404
405
406
407
408
409
410
411
412
413
414
415
416
417
418
419
420
421
422
423
424
425
426
427
428
429
430
431
432
433
434
435
436
437
438
439
440
441
442
443
444
445
446
447
448
449
450
451
452
453
454
455
456
457
458
459
460
461
462
463
464
465
466
467
468
469
470
471
472
473
474
475
476
477
478
479
480
481
482
483
484
485
486
487
488
489
490
491
492
493
494
495
496
497
498
499
500
501
502
503
504
505
506
507
508
509
510
511
512
513
514
515
516
517
518
519
520
521
522
523
524
525
526
527
528
529
530
531
532
533
534
535
536
537
538
539
540
541
542
543
544
545
546
547
548
549
550
551
552
553
554
555
556
557
558
559
560
561
562
563
564
565
566
567
568
569
570
571
572
573
574
575
576
577
578
579
580
581
582
583
584
585
586
587
588
589
590
591
592
593
594
595
596
597
598
599
600
601
602
603
604
605
606
607
608
609
610
611
612
613
614
615
616
617
618
619
620
621
622
623
624
625
626
627
628
629
630
631
632
633
634
635
636
637
638
639
640
641
642
643
644
645
646
647
648
649
650
651
652
653
654
655
656
657
658
659
660
661
662
663
664
665
666
667
668
669
670
671
672
673
674
675
676
677
678
679
680
681
682
683
684
685
686
687
688
689
690
691
692
693
694
695
696
697
698
699
700
701
702
703
704
705
706
707
708
709
710
711
712
713
714
715
716
717
718
719
720
721
722
723
724
725
726
727
728
729
730
731
732
733
734
735
736
737
738
739
740
741
742
743
744
745
746
747
748
749
750
751
752
753
754
755
756
757
758
759
760
761
762
763
764
765
766
767
768
769
770
771
772
773
774
775
776
777
778
779
780
781
782
783
784
785
786
787
788
789
790
791
792
793
794
795
796
797
798
799
800
801
802
803
804
805
806
807
808
809
810
811
812
813
814
815
816
817
818
819
820
821
822
823
824
825
826
827
828
829
830
831
832
833
834
835
836
837
838
839
840
841
842
843
844
845
846
847
848
849
850
851
852
853
854
855
856
857
858
859
860
861
862
863
864
865
866
867
868
869
870
871
872
873
874
875
876
877
878
879
880
881
882
883
884
885
886
887
888
889
890
891
892
893
894
895
896
897
898
899
900
901
902
903
904
905
906
907
908
909
910
911
912
913
914
915
916
917
918
919
920
921
922
923
924
925
926
927
928
929
930
931
932
933
934
935
936
937
938
939
940
941
942
943
944
945
946
947
948
949
950
951
952
953
954
955
956
957
958
959
960
961
962
963
964
965
966
967
968
969
970
971
972
973
974
975
976
977
978
979
980
981
982
983
984
985
986
987
988
989
990
991
992
993
994
995
996
997
998
999
1000
1001
1002
1003
1004
1005
1006
1007
1008
1009
1010
1011
1012
1013
1014
1015
1016
1017
1018
1019
1020
1021
1022
1023
1024
1025
1026
1027
1028
1029
1030
1031
1032
1033
1034
1035
1036
1037
1038
1039
1040
1041
1042
1043
1044
1045
1046
1047
1048
1049
1050
1051
1052
1053
1054
1055
1056
1057
1058
1059
1060
1061
1062
1063
1064
1065
1066
1067
1068
1069
1070
1071
1072
1073
1074
1075
1076
1077
1078
1079
1080
1081
1082
1083
1084
1085
1086
1087
1088
1089
1090
1091
1092
1093
1094
1095
1096
1097
1098
1099
1100
1101
1102
1103
1104
1105
1106
1107
1108
1109
1110
1111
1112
1113
1114
1115
1116
1117
1118
1119
1120
1121
1122
1123
1124
1125
1126
1127
1128
1129
1130
1131
1132
1133
1134
1135
1136
1137
1138
1139
1140
1141
1142
1143
1144
1145
1146
1147
1148
1149
1150
1151
1152
1153
1154
1155
1156
1157
1158
1159
1160
1161
1162
1163
1164
1165
1166
1167
1168
1169
1170
1171
1172
1173
1174
1175
1176
1177
1178
1179
1180
1181
1182
1183
1184
1185
1186
1187
1188
1189
1190
1191
1192
1193
1194
1195
1196
1197
1198
1199
1200
1201
1202
1203
1204
1205
1206
1207
1208
1209
1210
1211
1212
1213
1214
1215
1216
1217
1218
1219
1220
1221
1222
1223
1224
1225
1226
1227
1228
1229
1230
1231
1232
1233
1234
1235
1236
1237
1238
1239
1240
1241
1242
1243
1244
1245
1246
1247
1248
1249
1250
1251
1252
1253
1254
1255
1256
1257
1258
1259
1260
1261
1262
1263
1264
1265
1266
1267
1268
1269
1270
1271
1272
1273
1274
1275
1276
1277
1278
1279
1280
1281
1282
1283
1284
1285
1286
1287
1288
1289
1290
1291
1292
1293
1294
1295
1296
1297
1298
1299
1300
1301
1302
1303
1304
1305
1306
1307
1308
1309
1310
1311
1312
1313
1314
1315
1316
1317
1318
1319
1320
1321
1322
1323
1324
1325
1326
1327
1328
1329
1330
1331
1332
1333
1334
1335
1336
1337
1338
1339
1340
1341
1342
1343
1344
1345
1346
1347
1348
1349
1350
1351
1352
1353
1354
1355
1356
1357
1358
1359
1360
1361
1362
1363
1364
1365
1366
1367
1368
1369
1370
1371
1372
1373
1374
1375
1376
1377
1378
1379
1380
1381
1382
1383
1384
1385
1386
1387
1388
1389
1390
1391
1392
1393
1394
1395
1396
1397
1398
1399
1400
1401
1402
1403
1404
1405
1406
1407
1408
1409
1410
1411
1412
1413
1414
1415
1416
1417
1418
1419
1420
1421
1422
1423
1424
1425
1426
1427
1428
1429
1430
1431
1432
1433
1434
1435
1436
1437
1438
1439
1440
1441
1442
1443
1444
1445
1446
1447
1448
1449
1450
1451
1452
1453
1454
1455
1456
1457
1458
1459
1460
1461
1462
1463
1464
1465
1466
1467
1468
1469
1470
1471
1472
1473
1474
1475
1476
1477
1478
1479
1480
1481
1482
1483
1484
1485
1486
1487
1488
1489
1490
1491
1492
1493
1494
1495
1496
1497
1498
1499
1500
1501
1502
1503
1504
1505
1506
1507
1508
1509
1510
1511
1512
1513
1514
1515
1516
1517
1518
1519
1520
1521
1522
1523
1524
1525
1526
1527
1528
1529
1530
1531
1532
1533
1534
1535
1536
1537
1538
1539
1540
1541
1542
1543
1544
1545
1546
1547
1548
1549
1550
1551
1552
1553
1554
1555
1556
1557
1558
1559
1560
1561
1562
1563
1564
1565
1566
1567
1568
1569
1570
1571
1572
1573
1574
1575
1576
1577
1578
1579
1580
1581
1582
1583
1584
1585
1586
1587
1588
1589
1590
1591
1592
1593
1594
1595
1596
1597
1598
1599
1600
1601
1602
1603
1604
1605
1606
1607
1608
1609
1610
1611
1612
1613
1614
1615
1616
1617
1618
1619
1620
1621
1622
1623
1624
1625
1626
1627
1628
1629
1630
1631
1632
1633
1634
1635
1636
1637
1638
1639
1640
1641
1642
1643
1644
1645
1646
1647
1648
1649
1650
1651
1652
1653
1654
1655
1656
1657
1658
1659
1660
1661
1662
1663
1664
1665
1666
1667
1668
1669
1670
1671
1672
1673
1674
1675
1676
1677
1678
1679
1680
1681
1682
1683
1684
1685
1686
1687
1688
1689
1690
1691
1692
1693
1694
1695
1696
1697
1698
1699
1700
1701
1702
1703
1704
1705
1706
1707
1708
1709
1710
1711
1712
1713
1714
1715
1716
1717
1718
1719
1720
1721
1722
1723
1724
1725
1726
1727
1728
1729
1730
1731
1732
1733
1734
1735
1736
1737
1738
1739
1740
1741
1742
1743
1744
1745
1746
1747
1748
1749
1750
1751
1752
1753
1754
1755
1756
1757
1758
1759
1760
1761
1762
1763
1764
1765
1766
1767
1768
1769
1770
1771
1772
1773
1774
1775
1776
1777
1778
1779
1780
1781
1782
1783
1784
1785
1786
1787
1788
1789
1790
1791
1792
1793
1794
1795
1796
1797
1798
1799
1800
1801
1802
1803
1804
1805
1806
1807
1808
1809
1810
1811
1812
1813
1814
1815
1816
1817
1818
1819
1820
1821
1822
1823
1824
1825
1826
1827
1828
1829
1830
1831
1832
1833
1834
1835
1836
1837
1838
1839
1840
1841
1842
1843
1844
1845
1846
1847
1848
1849
1850
1851
1852
1853
1854
1855
1856
1857
1858
1859
1860
1861
1862
1863
1864
1865
1866
1867
1868
1869
1870
1871
1872
1873
1874
1875
1876
1877
1878
1879
1880
1881
1882
1883
1884
1885
1886
1887
1888
1889
1890
1891
1892
1893
1894
1895
1896
1897
1898
1899
1900
1901
1902
1903
1904
1905
1906
1907
1908
1909
1910
1911
1912
1913
1914
1915
1916
1917
1918
1919
1920
1921
1922
1923
1924
1925
1926
1927
1928
1929
1930
1931
1932
1933
1934
1935
1936
1937
1938
1939
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952
1953
1954
1955
1956
1957
1958
1959
1960
1961
1962
1963
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038
2039
2040
2041
2042
2043
2044
2045
2046
2047
2048
2049
2050
2051
2052
2053
2054
2055
2056
2057
2058
2059
2060
2061
2062
2063
2064
2065
2066
2067
2068
2069
2070
2071
2072
2073
2074
2075
2076
2077
2078
2079
2080
2081
2082
2083
2084
2085
2086
2087
2088
2089
2090
2091
2092
2093
2094
2095
2096
2097
2098
2099
2100
2101
2102
2103
2104
2105
2106
2107
2108
2109
2110
2111
2112
2113
2114
2115
2116
2117
2118
2119
2120
2121
2122
2123
2124
2125
2126
2127
2128
2129
2130
2131
2132
2133
2134
2135
2136
2137
2138
2139
2140
2141
2142
2143
2144
2145
2146
2147
2148
2149
2150
2151
2152
2153
2154
2155
2156
2157
2158
2159
2160
2161
2162
2163
2164
2165
2166
2167
2168
2169
2170
2171
2172
2173
2174
2175
2176
2177
2178
2179
2180
2181
2182
2183
2184
2185
2186
2187
2188
2189
2190
2191
2192
2193
2194
2195
2196
2197
2198
2199
2200
2201
2202
2203
2204
2205
2206
2207
2208
2209
2210
2211
2212
2213
2214
2215
2216
2217
2218
2219
2220
2221
2222
2223
2224
2225
2226
2227
2228
2229
2230
2231
2232
2233
2234
2235
2236
2237
2238
2239
2240
2241
2242
2243
2244
2245
2246
2247
2248
2249
2250
2251
2252
2253
2254
2255
2256
2257
2258
2259
2260
2261
2262
2263
2264
2265
2266
2267
2268
2269
2270
2271
2272
2273
2274
2275
2276
2277
2278
2279
2280
2281
2282
2283
2284
2285
2286
2287
2288
2289
2290
2291
2292
2293
2294
2295
2296
2297
2298
2299
2300
2301
2302
2303
2304
2305
2306
2307
2308
2309
2310
2311
2312
2313
2314
2315
2316
2317
2318
2319
2320
2321
2322
2323
2324
2325
2326
2327
2328
2329
2330
2331
2332
2333
2334
2335
2336
2337
2338
2339
2340
2341
2342
2343
2344
2345
2346
2347
2348
2349
2350
2351
2352
2353
2354
2355
2356
2357
2358
2359
2360
2361
2362
2363
2364
2365
2366
2367
2368
2369
2370
2371
2372
2373
2374
2375
2376
2377
2378
2379
2380
2381
2382
2383
2384
2385
2386
2387
2388
2389
2390
2391
2392
2393
2394
2395
2396
2397
2398
2399
2400
2401
2402
2403
2404
2405
2406
2407
2408
2409
2410
2411
2412
2413
2414
2415
2416
2417
2418
2419
2420
2421
2422
2423
2424
2425
2426
2427
2428
2429
2430
2431
2432
2433
2434
2435
2436
2437
2438
2439
2440
2441
2442
2443
2444
2445
2446
2447
2448
2449
2450
2451
2452
2453
2454
2455
2456
2457
2458
2459
2460
2461
2462
2463
2464
2465
2466
2467
2468
2469
2470
2471
2472
2473
2474
2475
2476
2477
2478
2479
2480
2481
2482
2483
2484
2485
2486
2487
2488
2489
2490
2491
2492
2493
2494
2495
2496
2497
2498
2499
2500
2501
2502
2503
2504
2505
2506
2507
2508
2509
2510
2511
2512
2513
2514
2515
2516
2517
2518
2519
2520
2521
2522
2523
2524
2525
2526
2527
2528
2529
2530
2531
2532
2533
2534
2535
2536
2537
2538
2539
2540
2541
2542
2543
2544
2545
2546
2547
2548
2549
2550
2551
2552
2553
2554
2555
2556
2557
2558
2559
2560
2561
2562
2563
2564
2565
2566
2567
2568
2569
2570
2571
2572
2573
2574
2575
2576
2577
2578
2579
2580
2581
2582
2583
2584
2585
2586
2587
2588
2589
2590
2591
2592
2593
2594
2595
2596
2597
2598
2599
2600
2601
2602
2603
2604
2605
2606
2607
2608
2609
2610
2611
2612
2613
2614
2615
26
```


CASE_CENTRE_004							
QUERY	COUNT ROW	VIEW ROW	LAST DTS				
EDIT		PK_CASE_CENTRE_ID	CASE_CENTRE_NAME	CASE_CENTRE_ID	WARD_NAME	TOWN	POST_CODE
	1		JUNI Carehome	5	GENERAL WARD	Hemington	HD1 4SD
	2		ALTON Carehome	2	GENERAL WARD	Shephall	91 92
	3		ALTON Carehome	2	GENERAL WARD	Shephall	91 92
	4		OSCAR Carehome	2	GENERAL WARD	Leeds	LS1 9Z
	5		OSCAR Carehome	2	GENERAL WARD	Leeds	LS1 9Z
	6		LAB Carehome	1	GENERAL WARD	Leeds	LS4 9BN
	7		BEVIA Carehome	1	GENERAL WARD	Bradford	BD4 0NA
	8		JUNI Carehome	2	GENERAL WARD	Hemington	HD1 4SD
	9		WILLBROOK Carehome	2	ICU	WAKEFIELD	WF1 4SD
	10		BEVIA Carehome	1	GENERAL WARD	Bradford	BD4 0NA
	11		LAB Carehome	1	GENERAL WARD	Leeds	LS4 9BN

[illegible]

TMP_BED_OCCUPANCY								
Table	Data	Indexes	Model	Constraints	Views	Statistics	Job Defaults	Triggers
Query	Query Block	Insert Row	Load Data					
ERT	BED STATUS	WARD NAME	CARE CENTER NAME	TERM	POSTCODE	YEAR	MONTH	
	AVAILABLE	GENERAL WARD	UN Carehome	Leeds	LS4 0BN	2023	APR	
	OCCUPIED	GENERAL WARD	UN Carehome	Leeds	LS4 0BN	2023	APR	
	OCCUPIED	GENERAL WARD	UN Carehome	Leeds	LS4 0BN	2023	APR	
	OCCUPIED	GENERAL WARD	UN Carehome	Leeds	LS4 0BN	2023	APR	
	AVAILABLE	GENERAL WARD	UN Carehome	Leeds	LS4 0BN	2023	APR	
	OCCUPIED	GENERAL WARD	UN Carehome	Leeds	LS4 0BN	2023	APR	
	OCCUPIED	GENERAL WARD	JUNO Carehome	Warrington	M43 4DG	2023	APR	
	OCCUPIED	GENERAL WARD	JUNO Carehome	Warrington	M43 4DG	2023	APR	
	AVAILABLE	GENERAL WARD	JUNO Carehome	Warrington	M43 4DG	2023	FEB	
	OCCUPIED	GENERAL WARD	OSCAR Carehome	Leeds	LS1 6B	2023	JAN	
	OCCUPIED	GENERAL WARD	OSCAR Carehome	Leeds	LS1 6B	2023	FEB	
	OCCUPIED	GENERAL WARD	JUNO Carehome	Warrington	M43 4DG	2023	NOV	
	OCCUPIED	GENERAL WARD	JUNO Carehome	Warrington	M43 4DG	2023	NOV	
	AVAILABLE	GENERAL WARD	OSCAR Carehome	Leeds	LS1 6B	2023	NOV	

RES_OCCUPANCY_FACT							
NAME	DATA	STATUS	INDEX	COLUMNS	SCHEM	STATISTICS	DEFINITION
Query	Query Plan	Execution	Load Data				
EST	IN_REPORT_ID	PRG_PK_TIME_ID	PRG_PK_CASE_ENTIRE_ID	TOTAL_RES_OCCUPANCY	PERCENTAGE_RES_OCCUPANCY		
01	1	4	1	2	100		
02	2	7	1	2	100		
03	3	8	1	2	100		
04	4	8	1	2	80		
05	5	8	4	4	100		
06	6	2	2	0	0		
07	7	8	2	4	100		
08	8	2	0	0	0		
09	9	1	0	0	0		
10	10	4	4	2	100		
11	11	4	4	2	100		
12	12	2	4	2	100		
13	13	5	2	2	100		
14	14	1	3	0	0		
15	15	4	2	2	100		

Slowing Changing Dimension (SCD)

KIMBALL TYPE1 which involves altering or changing the value that is wrong to a value that is corrected (Kimball,2013)

A	B	C	D	E	F	G	H
CARE_CENTRE_ID	CARE_CENTRE_NAME	TOWN	EMAIL	PHONE	POSTCODE		
1	BEWAN CAREHOME	BRADFORD	BEWANCAREHOME@GMAIL.COM	(088)224-34125	S1 1EE		
CARE_CENTRE_ID	CARE_CENTRE_NAME	TOWN	EMAIL	PHONE	POSTCODE		
260	BEWAN CAREHOME	BRADFORD	BEWANCAREHOME@GMAIL.COM	(088)244-34125	BD1 ZBN		

Figure 5: Sample Data Type 1

KIMBALL TYPE 2(SECOND APPROACH) which involves creating a new row added to the previous information.

CARE_CENTRE_ID	CARE_CENTRE_NAME	TOWN	EMAIL	PHONE	POSTCODE
1	BEWAN CAREHOME	BRADFORD	BEWANCAREHOME@GMAIL.COM	(088)224-34125	S1 1EE
1	BEWAN CAREHOME	BRADFORD	BEWANCAREHOME@GMAIL.COM	(088)244-34125	BD1 ZBN

Figure 6: Sample Data Type 2

The type 3 and a final approach would be type 3. It involves an approach to add a new column to the previous column with the postcode.

CARE_CENTRE_ID	CARE_CENTRE_NAME	TOWN	EMAIL	PHONE	POSTCODE	PRIOR POSTCODE
1	BEWAN CAREHOME	BRADFORD	BEWANCAREHOME@GMAIL.COM	(088)224-34125	BD1 ZBN	S1 1EE

Figure 7: Sample Data Type 3

APPENDIXES:

-----STAGING AREA

----CREATE TABLE merged_data AS

DROP TABLE V1_STAGING_AREA CASCADE CONSTRAINTS;

CREATE TABLE V1_STAGING_AREA AS

SELECT

wyr_c.care_centre_name AS care_centre_name,
wyr_c.care_id AS care_centre_id,
wyr_c.postcode AS postcode,
wyr_c.town AS town,
wyr_bed.bed_status AS bed_status,
wyr_ward.ward_name AS ward_name,
wyr_res.Admission_Date AS admission_date

FROM

WYR_CARE_CENTRE wyr_c

JOIN

WYR_WARD wyr_ward ON wyr_c.care_id = wyr_ward.care_id

JOIN

WYR_BED wyr_bed ON wyr_ward.ward_no = wyr_bed.ward_no

JOIN

WYR_RESERVATION wyr_res ON wyr_res.Reservation_Id IN (SELECT Reservation_Id FROM WYR_BedAssigned WHERE bed_no = wyr_bed.bed_no);

ALTER TABLE V1_STAGING_AREA
ADD DATASOURCE VARCHAR2(25);

UPDATE V1_STAGING_AREA
SET DATASOURCE = 'WYR';

-- COMBINNING THE TABLES.

INSERT INTO V1_STAGING_AREA

SELECT

nyr_c.Care_centre_name AS care_centre_name,
nyr_c.care_centre_id AS care_centre_id,
nyr_c.postcode AS postcode,
nyr_c.town AS town,

```

    nyr_bed.bed_status AS bed_status,
    nyr_ward.ward_name AS ward_name,
    nyr_adm.Admission_date AS admission_date,
    'NYR'
FROM
    NYR_CARE_CENTRE nyr_c
JOIN
    NYR_WARD nyr_ward ON nyr_ward.care_centre_id = nyr_c.care_centre_id
JOIN
    NYR_BED nyr_bed ON nyr_bed.ward_id = nyr_ward.ward_id
JOIN
    NYR_ADMISSION nyr_adm ON nyr_adm.bed_id = nyr_bed.bed_id;

```

```
-- SELECT * FROM V1_STAGING_AREA
```

```
- ETL_log
```

```
DROP table new_etl_log cascade constraints;
```

```

CREATE TABLE new_etl_log
(issue_id NUMBER(5) NOT NULL,
table_name VARCHAR2(20),
data_error_code NUMBER(5),
issue_desc VARCHAR2(50),
issue_date DATE,
issue_status VARCHAR2(20),
status_update_date DATE);

```

```

drop sequence NEW_EL_SEQ;
create sequence NEW_EL_SEQ
start with 1
increment by 1

```

```
maxvalue 10000  
minvalue 1;
```

```
-- DROP TRIGGER V1_STAGING_AREA.V1_trg_quality_chk;
```

```
CREATE or REPLACE trigger V1_trg_quality_chk  
before update on V1_STAGING_AREA  
for each row  
begin  
INSERT INTO NEW_ETL_log  
(issue_id, table_name, data_error_code, issue_desc, issue_date, issue_status, status_update_date)  
VALUES  
(NEW_EL_SEQ.nextval, 'V1_STAGING_AREA', '0', 'Quality checks', SYSDATE, 'completed', SYSDATE);  
end;
```

```
DELETE FROM V1_STAGING_AREA  
WHERE ADMISSION_DATE IS NULL;
```

```
---QUALITY CHECKS
```

```
---UPDATING THE BED STATUS FOR DATA INTEGRITY,  
STANDARDLIZING DATA CHANGING ALL LOWERCASE OCCUPIED TO UPPERCASE Occupied
```

```
UPDATE V1_STAGING_AREA  
SET BED_STATUS = 'OCCUPIED'  
WHERE UPPER(BED_STATUS) = 'OCCUPIED' OR BED_STATUS = 'Occupied';
```

```
----Updated rows with 'NOT OCCUPIED' to 'Available'
```

```
UPDATE V1_STAGING_AREA  
SET BED_STATUS = 'AVAILABLE'
```

```
WHERE UPPER(BED_STATUS) = 'NOT OCCUPIED';
-----Updated lowercase 'Available' to 'AVAILABLE'
UPDATE V1_STAGING_AREA
SET BED_STATUS = 'AVAILABLE'
WHERE UPPER(BED_STATUS) = 'AVAILABLE' OR BED_STATUS = 'Available';
```

```
UPDATE V1_STAGING_AREA
SET WARD_NAME = 'GENERAL WARD'
WHERE UPPER(WARD_NAME) = 'GENERAL CARE';
```

ADMISSION DATE WAS CLEANED BY SEPERATING DATE AND TIME USING TO_DATE TO CONVERT TO DATE FORMATE

---ADDED A NEW COLUMN FOR THE DATE EXCLUDING TIME

```
ALTER TABLE V1_STAGING_AREA DROP COLUMN NEW_ADMISSION_DATE;
```

```
ALTER TABLE V1_STAGING_AREA ADD NEW_ADMISSION_DATE DATE;
```

---UPDATE MY NEW COLUMN DATE FORMAT

```
UPDATE V1_STAGING_AREA
SET NEW_ADMISSION_DATE = TO_DATE(TO_CHAR(ADMISSION_DATE, 'DD-MON-YY'), 'DD-MON-YY');
```

---FOR DROPPING THE REAL ADMISSION DATE COLUMN

```
-- ALTER TABLE V1_STAGING_AREA DROP COLUMN ADMISSION_DATE;
```

---DROP V2_STAGING_AREA

```
DROP TABLE V2_STAGING_AREA;
```

---CREATE TABLE V2_STAGING AREA;

---DELETE FROM V2_STAGING_AREA;

-- #DONE

----Date Transformation

CREATE TABLE V2_STAGING_AREA AS
SELECT

CARE_CENTRE_NAME,
CARE_CENTRE_ID,
POSTCODE,
TOWN,
EXTRACT(YEAR FROM NEW_ADMISSION_DATE) AS YEAR,
TO_CHAR(NEW_ADMISSION_DATE, 'MON') AS MONTH,
BED_STATUS,
WARD_NAME,
DATASOURCE

FROM V1_STAGING_AREA;

INSERT INTO V2_STAGING_AREA(SELECT

CARE_CENTRE_NAME,
CARE_CENTRE_ID,
POSTCODE,
TOWN,
EXTRACT(YEAR FROM NEW_ADMISSION_DATE) AS YEAR,
TO_CHAR(NEW_ADMISSION_DATE, 'MON') AS MONTH,
BED_STATUS,
WARD_NAME,
DATASOURCE

FROM V1_STAGING_AREA

WHERE EXTRACT(YEAR FROM NEW_ADMISSION_DATE) = 2023 AND TO_CHAR(NEW_ADMISSION_DATE, 'MON')
= 'NOV');

INSERT INTO V2_STAGING_AREA(SELECT

CARE_CENTRE_NAME,

```
CARE_CENTRE_ID,  
POSTCODE,  
TOWN,  
EXTRACT(YEAR FROM NEW_ADMISSION_DATE) AS YEAR,  
TO_CHAR(NEW_ADMISSION_DATE, 'MON') AS MONTH,  
BED_STATUS,  
WARD_NAME,  
DATASOURCE  
FROM V1_STAGING_AREA  
WHERE EXTRACT(YEAR FROM NEW_ADMISSION_DATE) = 2022 AND TO_CHAR(NEW_ADMISSION_DATE, 'MON')  
= 'NOV');
```

```
INSERT INTO V2_STAGING_AREA(SELECT  
CARE_CENTRE_NAME,  
CARE_CENTRE_ID,  
POSTCODE,  
TOWN,  
EXTRACT(YEAR FROM NEW_ADMISSION_DATE) AS YEAR,  
TO_CHAR(NEW_ADMISSION_DATE, 'MON') AS MONTH,  
BED_STATUS,  
WARD_NAME,  
DATASOURCE  
FROM V1_STAGING_AREA  
WHERE EXTRACT(YEAR FROM NEW_ADMISSION_DATE) = 2021 AND TO_CHAR(NEW_ADMISSION_DATE, 'MON')  
= 'NOV');
```

```
INSERT INTO V2_STAGING_AREA(SELECT  
CARE_CENTRE_NAME,  
CARE_CENTRE_ID,  
POSTCODE,  
TOWN,  
EXTRACT(YEAR FROM NEW_ADMISSION_DATE) AS YEAR,
```



```
    TO_CHAR(NEW_ADMISSION_DATE, 'MON') AS MONTH,  
    BED_STATUS,  
    WARD_NAME,  
    DATASOURCE  
FROM V1_STAGING_AREA  
WHERE EXTRACT(YEAR FROM NEW_ADMISSION_DATE) = 2022 AND TO_CHAR(NEW_ADMISSION_DATE, 'MON')  
= 'JAN');
```

```
INSERT INTO V2_STAGING_AREA(SELECT  
    CARE_CENTRE_NAME,  
    CARE_CENTRE_ID,  
    POSTCODE,  
    TOWN,  
    EXTRACT(YEAR FROM NEW_ADMISSION_DATE) AS YEAR,  
    TO_CHAR(NEW_ADMISSION_DATE, 'MON') AS MONTH,  
    BED_STATUS,  
    WARD_NAME,  
    DATASOURCE  
FROM V1_STAGING_AREA  
WHERE EXTRACT(YEAR FROM NEW_ADMISSION_DATE) = 2023 AND TO_CHAR(NEW_ADMISSION_DATE, 'MON')  
= 'JAN');
```

```
INSERT INTO V2_STAGING_AREA(SELECT  
    CARE_CENTRE_NAME,  
    CARE_CENTRE_ID,  
    POSTCODE,  
    TOWN,  
    EXTRACT(YEAR FROM NEW_ADMISSION_DATE) AS YEAR,  
    TO_CHAR(NEW_ADMISSION_DATE, 'MON') AS MONTH,  
    BED_STATUS,  
    WARD_NAME,  
    DATASOURCE
```

```
FROM V1_STAGING_AREA
WHERE EXTRACT(YEAR FROM NEW_ADMISSION_DATE) = 2023 AND TO_CHAR(NEW_ADMISSION_DATE, 'MON')
= 'FEB');
```

```
INSERT INTO V2_STAGING_AREA(SELECT
    CARE_CENTRE_NAME,
    CARE_CENTRE_ID,
    POSTCODE,
    TOWN,
    EXTRACT(YEAR FROM NEW_ADMISSION_DATE) AS YEAR,
    TO_CHAR(NEW_ADMISSION_DATE, 'MON') AS MONTH,
    BED_STATUS,
    WARD_NAME,
    DATASOURCE
FROM V1_STAGING_AREA
WHERE EXTRACT(YEAR FROM NEW_ADMISSION_DATE) = 2022 AND TO_CHAR(NEW_ADMISSION_DATE, 'MON')
= 'FEB');
```

```
INSERT INTO V2_STAGING_AREA(SELECT
    CARE_CENTRE_NAME,
    CARE_CENTRE_ID,
    POSTCODE,
    TOWN,
    EXTRACT(YEAR FROM NEW_ADMISSION_DATE) AS YEAR,
    TO_CHAR(NEW_ADMISSION_DATE, 'MON') AS MONTH,
    BED_STATUS,
    WARD_NAME,
    DATASOURCE
FROM V1_STAGING_AREA
WHERE EXTRACT(YEAR FROM NEW_ADMISSION_DATE) = 2023 AND TO_CHAR(NEW_ADMISSION_DATE, 'MON')
= 'APR');
---DONE
```

```
INSERT INTO V2_STAGING_AREA(SELECT
    CARE_CENTRE_NAME,
    CARE_CENTRE_ID,
    POSTCODE,
    TOWN,
    EXTRACT(YEAR FROM NEW_ADMISSION_DATE) AS YEAR,
    TO_CHAR(NEW_ADMISSION_DATE, 'MON') AS MONTH,
    BED_STATUS,
    WARD_NAME,
    DATASOURCE
FROM V1_STAGING_AREA
WHERE EXTRACT(YEAR FROM NEW_ADMISSION_DATE) = 2023 AND TO_CHAR(NEW_ADMISSION_DATE, 'MON')
= 'MAR');
```

```
DROP TABLE CARE_CENTRE_DIM CASCADE CONSTRAINTS;
```

```
DROP TABLE NEW_TIME_DIM CASCADE CONSTRAINTS;
```

```
DROP TABLE BED_OCCUPANCY_FACT CASCADE CONSTRAINTS;
```

```
-- Create a Database table to represent the "CARE_CENTRE_DIM" entity.
```

```
CREATE TABLE CARE_CENTRE_DIM(
    PK__Care_Centre_Id INTEGER NOT NULL,
    care_centre_name VARCHAR(20) NOT NULL,
    Care_Centre_Id INTEGER,
    ward_name VARCHAR(35),
    Town VARCHAR(35) NOT NULL,
    Post_code VARCHAR(10) NOT NULL,
```

```
-- Specify the PRIMARY KEY constraint for table "CARE_CENTRE_DIM".
-- This indicates which attribute(s) uniquely identify each row of data.
CONSTRAINT pk_CARE_CENTRE_DIM PRIMARY KEY (PK__Care_Centre_Id)
);
```

```
-- Create a Database table to represent the "TIME_DIM" entity.
```

```
CREATE TABLE NEW_TIME_DIM(
  PK__Time_Id INTEGER NOT NULL,
  Month VARCHAR(25) NOT NULL,
  Year INTEGER NOT NULL,
  -- Specify the PRIMARY KEY constraint for table "TIME_DIM".
  -- This indicates which attribute(s) uniquely identify each row of data.
  CONSTRAINT pk_NEW_TIME_DIM PRIMARY KEY (PK__Time_Id)
);
---THE_MONTH
---THE_YEAR
```

```
-- Create a Database table to represent the "BED_OCCUPANCY_FACT" entity.
```

```
CREATE TABLE BED_OCCUPANCY_FACT(
  PK__Report_Id INTEGER NOT NULL,
  fk1_PK__Time_Id INTEGER NOT NULL,
  fk2_PK__Care_Centre_Id INTEGER NOT NULL,
  Total_Bed_Occupancy INTEGER,
  Percentage_Bed_Occupancy INTEGER,
  -- Average_Bed_Occupancy_Rate INTEGER,
  -- Specify the PRIMARY KEY constraint for table "BED_OCCUPANCY_FACT".
  -- This indicates which attribute(s) uniquely identify each row of data.
  CONSTRAINT pk_BED_OCCUPANCY_FACT PRIMARY KEY (PK__Report_Id)
);
```

```
-- Alter Tables adding fk constraints --
```

```
ALTER TABLE BED_OCCUPANCY_FACT ADD CONSTRAINT fk1_BED_OCCUPANCY_FACT_to_TIME_DIM FOREIGN  
KEY(fk1_PK__Time_Id) REFERENCES NEW_TIME_DIM(PK__Time_Id);
```

-

- Alter table to add new constraints required to implement the "BED_OCCUPANCY_FACT_CARE_CENTRE_DIM" relationship

```
ALTER TABLE BED_OCCUPANCY_FACT ADD CONSTRAINT fk2_BED_OCCUPANCY_FACT_to_CARE_CENTRE_DIM  
FOREIGN KEY(fk2_PK__Care_Centre_Id) REFERENCES CARE_CENTRE_DIM(PK__Care_Centre_Id);
```

---LOADING

```
DROP sequence NEW_TIME_DIM_SEQ;  
create sequence NEW_TIME_DIM_SEQ  
start with 1  
increment by 1  
maxvalue 10000  
minvalue 1;
```

```
DROP SEQUENCE CARE_CENTRE_DIM_SEQ;  
Create sequence CARE_CENTRE_DIM_SEQ  
start with 1  
increment by 1  
maxvalue 10000  
minvalue 1;
```

```
DROP SEQUENCE BED_OCCUPANCY_FACT_SEQ;  
Create sequence BED_OCCUPANCY_FACT_SEQ  
start with 1  
increment by 1  
maxvalue 10000
```

minvalue 1;

INSERT INTO NEW_TIME_DIM VALUES(NEW_TIME_DIM_SEQ.nextval,'NOV',2021);

INSERT INTO NEW_TIME_DIM VALUES(NEW_TIME_DIM_SEQ.nextval,'JAN',2022);

INSERT INTO NEW_TIME_DIM VALUES(NEW_TIME_DIM_SEQ.nextval,'FEB',2022);

INSERT INTO NEW_TIME_DIM VALUES(NEW_TIME_DIM_SEQ.nextval,'NOV',2022);

INSERT INTO NEW_TIME_DIM VALUES(NEW_TIME_DIM_SEQ.nextval,'JAN',2023);

INSERT INTO NEW_TIME_DIM VALUES(NEW_TIME_DIM_SEQ.nextval,'FEB',2023);

INSERT INTO NEW_TIME_DIM VALUES(NEW_TIME_DIM_SEQ.nextval,'MAR',2023);

INSERT INTO NEW_TIME_DIM VALUES(NEW_TIME_DIM_SEQ.nextval,'APR',2023);

--DATA CLEANING,TMP TABLE,DATA USED

DROP TABLE TMP_CARE_CENTRE;

Create table TMP_CARE_CENTRE as SELECT DISTINCT Care_centre_name,CARE_CENTRE_ID,town,postcode,ward_name,bed_status from V2_STAGING_AREA;

INSERT INTO CARE_CENTRE_DIM SELECT CARE_CENTRE_DIM_SEQ.NEXTVAL,CARE_CENTRE_NAME,CARE_CENTRE_ID,ward_name,TOWN,POSTCODE FROM TMP_CARE_CENTRE;

DROP TABLE TMP_BED_OCCUPANCY1;

CREATE TABLE TMP_BED_OCCUPANCY1 AS SELECT BED_STATUS,WARD_NAME,CARE_CENTRE_NAME,TOWN,POSTCODE, YEAR,MONTH FROM V2_STAGING_AREA;

---CALCULATING PERCENTAGE OF OCCUPIED BED PER WARD PER CARE CENTRE,TOTAL BED OCCUPIED

DROP TABLE TMP_BED_OCCUPANCY2;

CREATE TABLE TMP_BED_OCCUPANCY2 AS SELECT YEAR,MONTH,CARE_CENTRE_NAME,WARD_NAME,SUM(CASE WHEN BED_STATUS='OCCUPIED' THEN 1 ELSE 0 END) AS TOTAL_BED_OCCUPANCY,
(SUM(CASE WHEN BED_STATUS='OCCUPIED' THEN 1 ELSE 0 END)/COUNT(*))*100 AS PERCENTAGE_BED_OCCUPANCY FROM TMP_BED_OCCUPANCY1 GROUP BY CARE_CENTRE_NAME,WARD_NAME, YEAR,MONTH;

```

INSERT INTO BED_OCCUPANCY_FACT(PK__Report_Id,fk1_PK__Time_Id,
    fk2_PK__Care_Centre_Id,
    Total_Bed_Occupancy,
    PERCENTAGE_BED_OCCUPANCY)
SELECT BED_OCCUPANCY_FACT_SEQ.NEXTVAL,NEW_TIME_DIM.PK__Time_Id,CARE_CENTRE_DIM.PK__Care_Centre_Id,TMP_BED_OCCUPANCY2.TOTAL_BED_OCCUPANCY,TMP_BED_OCCUPANCY2.PERCENTAGE_BED_OCCUPANCY
FROM TMP_BED_OCCUPANCY2,NEW_TIME_DIM,CARE_CENTRE_DIM
WHERE TMP_BED_OCCUPANCY2.YEAR=NEW_TIME_DIM.YEAR AND
TMP_BED_OCCUPANCY2.MONTH = NEW_TIME_DIM.MONTH AND
TMP_BED_OCCUPANCY2.CARE_CENTRE_NAME = CARE_CENTRE_DIM.CARE_CENTRE_NAME
;

```

SHORT CASE DUTY DESCRIPTION

North-West, Yorkshire Elderly Social & Health Care

North and West Yorkshire CCG (Clinical Commission Group) are requesting a health and social care system that integrates data from care homes and social care. The Leeds City Council (LCC) operates 6 Care Homes (3 NYR and 3 WYR) that provide additional support for elderly patients during their recovery period. The role of care homes is to act as an extended wing of a hospital. While LCC collaborate with over 200 elderly care providers, these six are part of the test case to produce a system to improve elderly patients experience and provide high quality care recovery period support.

There are two objectives with the system. One – to review Care Homes effectiveness, in terms of the recovery period and bed occupancy, second – support for doctors and social care services, where doctors *need to see the social care services provided to a patient, and social workers and service providers need to have access to the health care record.*

Giving the limits of the social care data (in this case study), there is more value for Social Carers to see patient data, then for doctors and nurses to see Social care systems data.

Note that while all elderly is seen as patients of the Care Homes, they may not necessarily be in the Social Care database.

As a BI consultant, you are expected to implement a solution that integrates WYR and NYR health data, as well as social care case data. The structure of the elderly health care system and social care system can be found below.

The structure of the health care system for the elderly

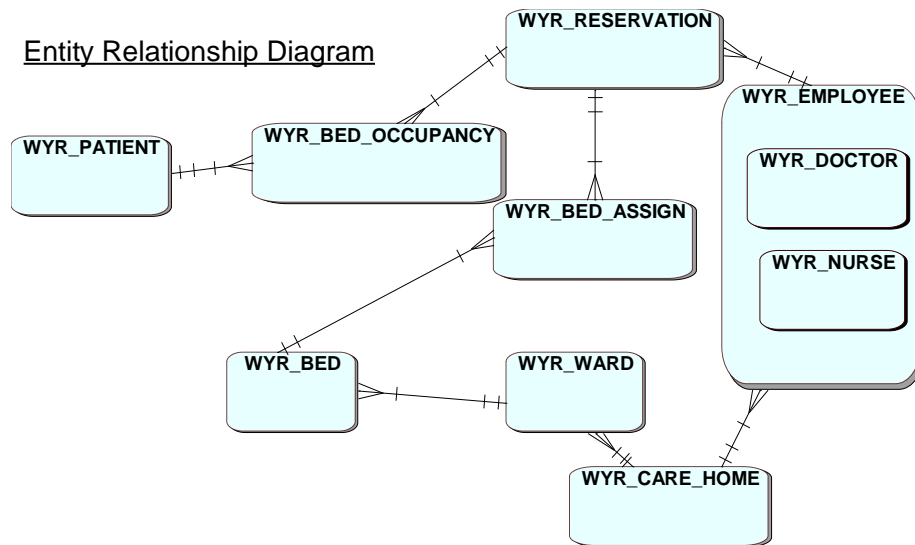
Below are details for the care homes that specialise in the care of elderly patients. At present, there are six "care centres" in North and West Yorkshire, that provide care to elderly patients during their recovery period.

Here's a sample of the information that could be stored:

- Patient name, date of birth, address and contact details.
- Patient ID, which makes sure your records are linked to your other records.
- Details of health conditions and illnesses
- Medicines and other treatments
- Stays on the ward/bed, long or short term
- Records of contact you've had with doctors and other health and care workers.

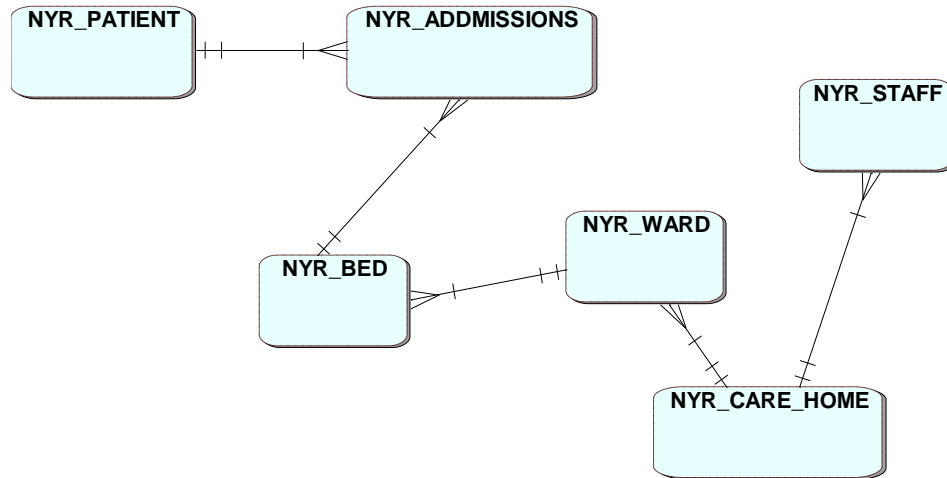
West Yorkshire (WYR) - Relational db design (ERD)

Entity Relationship Diagram



North Yorkshire (NYR) – Relational db design (ERD)

Entity Relationship Diagram



The Social Care System's partial structure can be found below:

Let's assume that the majority of the databases here are relational. Note that not all elderly people are in social care, hence, why there are many fewer records in the SCS system. It is assumed that Leeds City Council Elderly Social Health organizes its data in the following manner.

Client Table:

Name	Address	ClientID
Joy Ray	4 Church road, Bradford	1
Paula M. Condit	15 Quay Street, NAVESTOCK SIDE, CM14 1JQ	1

Referral Table

Date	Reason	Outcome	Source	CaseID
Date when the referral was made	Why need ASC services?	Decision	Who made the referral?	Internal Case ID
10/5/2023	Referral for Health Care	Referral to Elderly Care	Doctor	CID001
16/5/2023	Referral for Health Care	Referral to Elderly Care	Doctor	CID002

1/5/2023	Referral for Health Care	Referral to Elderly Care	Doctor	CID003
----------	--------------------------	--------------------------	--------	--------

Reason examples:

- Need for Assessment - Referral for Mental Health - Referral for Health Care – Signposting.

Outcome examples: Referral to Elderly Care, Referral to Mental Care, Referral to Health Sector.

Source examples: GP, Hospital, Police, Neighbour, Social worker, Family, etc.

Assessment Table

ClientID	CaseID	Date	Outcome	Source
Internal Client ID	Internal Case ID	When Assessment was made	Type of Service	Who made assessment ?
WYR_1	CID001	01/05/2023	Referral to Elderly Care	GP
NYR_1	CID002	01/05/2023	Referral to Elderly Care	GP

REFERENCE/BIBLIOGRAPHY

Turban, E., 2011. From *Decision support and business intelligence systems*. Pearson Education India.

Adams, C.2010: Star schema the complete reference, McGraw Hill Professional (2010) pp.34

Calvanese, D., De Giacomo, G., Lenzerini, M., Nardi, D. and Rosati, R., 2001. Data integration in data warehousing. *International Journal of Cooperative Information Systems*, 10(03), pp.237-271.

Freeman, R.E., Harrison, J.S. and Zyglidopoulos, S., 2018. *Stakeholder theory: Concepts and strategies*. Cambridge University Press.

Floridi, L. and Taddeo, M., 2016. What is data ethics?. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 374(2083), p.20160360

Gruschka, N., Mavroeidis, V., Vishi, K. and Jensen, M., 2018, December. Privacy issues and data protection in big data: a case study analysis under GDPR. In *2018 IEEE International Conference on Big Data (Big Data)* (pp. 5027-5033). IEEE.

Kimball, R., Ross, M., Thorthwaite, W., Becker, B. and Mundy, J., 2008. *The data warehouse lifecycle toolkit*. John Wiley & Sons.

Kimball, R., Ross, M., Becker, B. and Mundy, J. (2013). *The Data Warehouse Toolkit: The Definitive Guide to Dimensional Modeling*. Wiley

Lazer, D., Pentland, A., Adamic, L., Aral, S., Barabási, A., Brewer, D., Christakis, N., Contractor, N., Fowler, J., Gutmann, M., Jebara, T., King, G., Macy, M., Roy, D., & Van Alstyne, M. (2009). 'Computational Social Science'. *Science* vol. 323, pp. 721-3

Lashmar, P. (2017). No More Sources? :The impact of Snowden's revelations on journalists and their confidential sources. *Journalism Practice*, 11(6), 665–688. <https://doi.org/10.1080/17512786.2016.1179587>

Mason, R. O. (1986). Four ethical issues of the information age. *MIS Quarterly*, 10(1), 5–12.

Malinowski, E. and Zimányi, E., 2004. OLAP hierarchies: A conceptual perspective. In *Advanced Information Systems Engineering: 16th International Conference, CAiSE 2004, Riga, Latvia, June 7-11, 2004. Proceedings 16* (pp. 477-491). Springer Berlin Heidelberg.

N.K. Karthikeyan, Saravana Balaji. B and Revathy, S. (2013) From Data Warehouse to Streaming Warehouses: A survey on the Challenges for Real-Time Data Warehousing and Available Solution. International Journal of Computer Applications (0975-8887) Volume 81-No2, November 2013.