

U1M8.LW.Data Warehouse Architecture

Business Project

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https://github.com/VeraShkrabatouskaya/DataMola_Data-Camping-2022

2. Data Warehouse Architecture

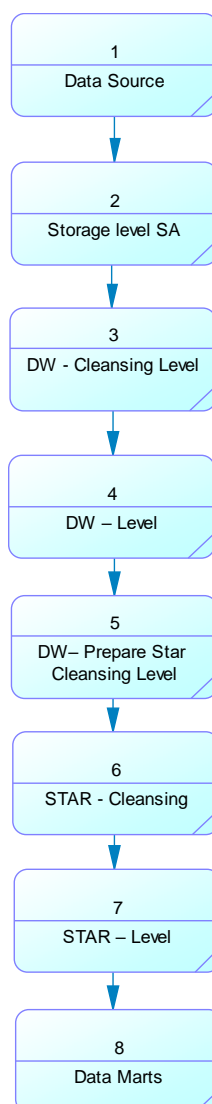
2.1. Task 01: CREATE Schema of simple Data Warehouse Architecture

Name Conversation table

Level Type	Object Name	Tablespace	Desctiption
Storage level SA_*	SA_CUSTOMERS	ts_sa_customers_data_01	Loading from structured files. Contains Customer information.
	SA_EMPLOYEES	ts_sa_employees_data_01	Loading from structured files. Contains Employee information.
	SA_PROMOTIONS	ts_sa_promotions_data_01	Loading from structured files. Contains Promotion information.
DW - Cleansing Level	DW_CL	ts_dw_cl	Loading from a scene-level system. Contains information about preparation for subsequent use (cleaning).
DW – Level	DW_DATA	ts_dw_data_01	Loading data from cleansing tables. Contains clean information tending to the 3rd normal form ready to prepare a star schema.
DW– Prepare Star Cleansing Level	SAL_DW_CL	ts_dw_str_cls	Loading data from DW system. Contains views merging objects from DW level.

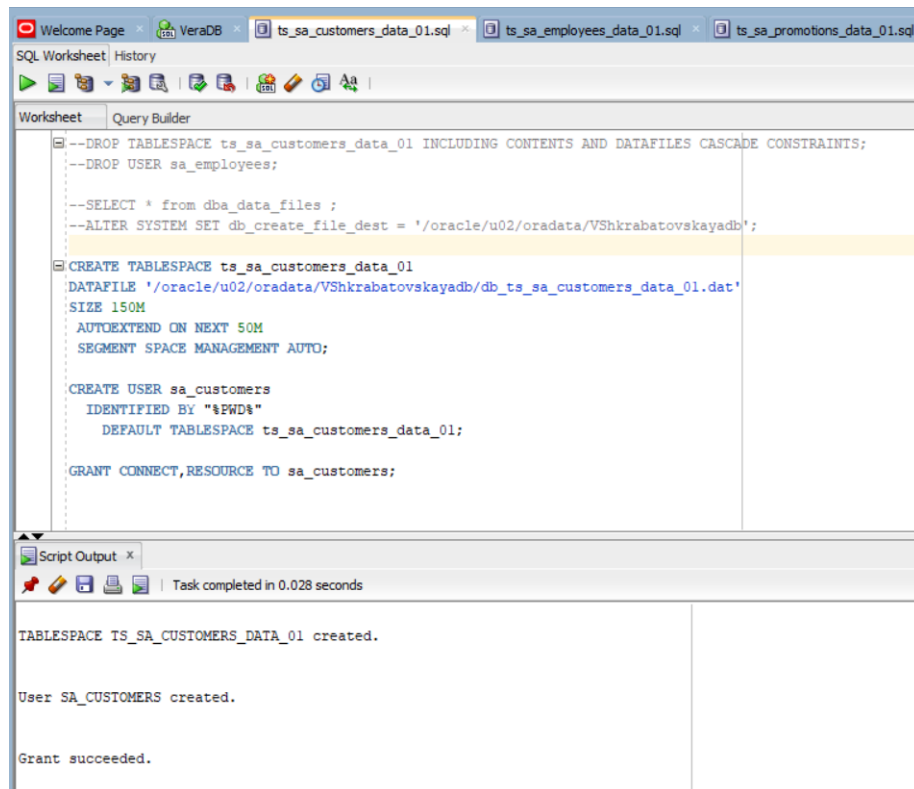
STAR - Cleansing	SAL_CL	ts_sal_cl	Loading data from DW_CL system. Contains views from previous level but clean any redundancy.
STAR – Level	DM_FCT_KPI	ts_sa_fct_kpi_01	Store information about fact KPI of ad promotions.
	DM_FCT_BUDGET	ts_sa_fct_budget_01	Store information about fact budget.
	DM_FCT_SALARY	ts_sa_fct_salary_01	Store information about fact salary of employees.
	DM_FCT_QUANTITY	ts_sa_fct_quantity_01	Store information about fact quantity of agency customers, employees and promotions.

Data Warehouse Architecture diagram



2.2. Task 02: CREATE Storage Level Storage level Objects

- ts_sa_customers_data_01



The screenshot shows a SQL Worksheet interface with a tab for 'ts_sa_customers_data_01.sql'. The SQL commands are as follows:

```
--DROP TABLESPACE ts_sa_customers_data_01 INCLUDING CONTENTS AND DATAFILES CASCADE CONSTRAINTS;
--DROP USER sa_employees;

--SELECT * from dba_data_files ;
--ALTER SYSTEM SET db_create_file_dest = '/oracle/u02/oradata/VShkrabatovskayadb';

CREATE TABLESPACE ts_sa_customers_data_01
DATAFILE '/oracle/u02/oradata/VShkrabatovskayadb/db_ts_sa_customers_data_01.dat'
SIZE 150M
AUTOEXTEND ON NEXT 50M
SEGMENT SPACE MANAGEMENT AUTO;

CREATE USER sa_customers
IDENTIFIED BY "$PWD$"
DEFAULT TABLESPACE ts_sa_customers_data_01;

GRANT CONNECT,RESOURCE TO sa_customers;
```

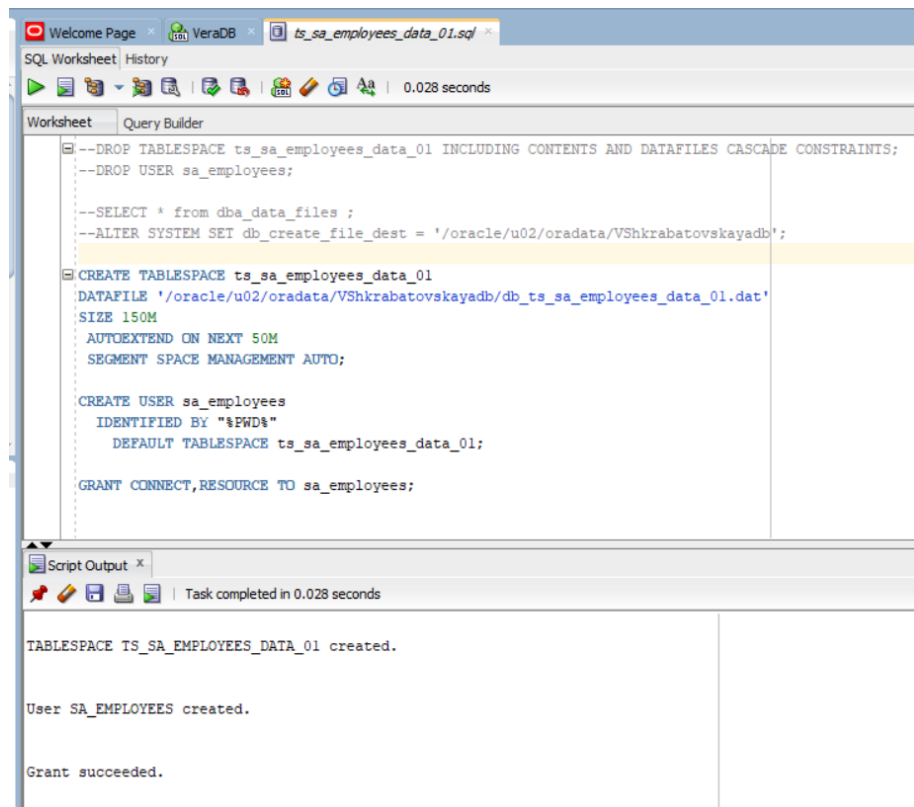
The Script Output pane shows the following results:

```
TABSPACE TS_SA_CUSTOMERS_DATA_01 created.

User SA_CUSTOMERS created.

Grant succeeded.
```

- ts_sa_employees_data_01



The screenshot shows a SQL Worksheet interface with a tab for 'ts_sa_employees_data_01.sql'. The SQL commands are as follows:

```
--DROP TABLESPACE ts_sa_employees_data_01 INCLUDING CONTENTS AND DATAFILES CASCADE CONSTRAINTS;
--DROP USER sa_employees;

--SELECT * from dba_data_files ;
--ALTER SYSTEM SET db_create_file_dest = '/oracle/u02/oradata/VShkrabatovskayadb';

CREATE TABLESPACE ts_sa_employees_data_01
DATAFILE '/oracle/u02/oradata/VShkrabatovskayadb/db_ts_sa_employees_data_01.dat'
SIZE 150M
AUTOEXTEND ON NEXT 50M
SEGMENT SPACE MANAGEMENT AUTO;

CREATE USER sa_employees
IDENTIFIED BY "$PWD$"
DEFAULT TABLESPACE ts_sa_employees_data_01;

GRANT CONNECT,RESOURCE TO sa_employees;
```

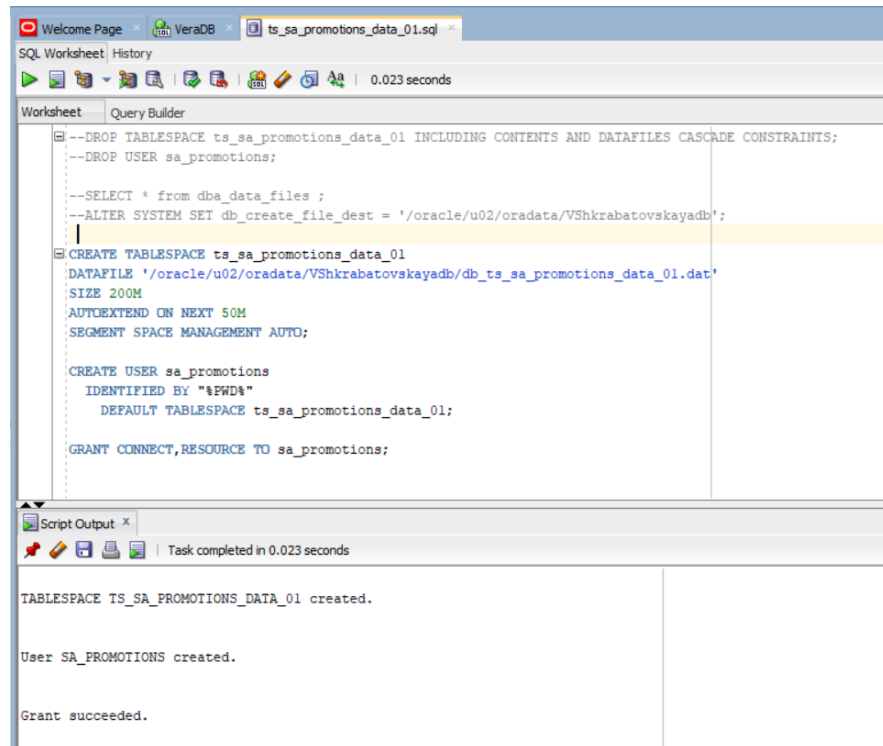
The Script Output pane shows the following results:

```
TABSPACE TS_SA_EMPLOYEES_DATA_01 created.

User SA_EMPLOYEES created.

Grant succeeded.
```

- ts_sa_promotions_data_01



The screenshot shows a SQL Worksheet interface with a tab titled 'ts_sa_promotions_data_01.sql'. The SQL commands are as follows:

```
--DROP TABLESPACE ts_sa_promotions_data_01 INCLUDING CONTENTS AND DATAFILES CASCADE CONSTRAINTS;
--DROP USER sa_promotions;

--SELECT * from dba_data_files ;
--ALTER SYSTEM SET db_create_file_dest = '/oracle/u02/oradata/VShkrabatovskayadb';

CREATE TABLESPACE ts_sa_promotions_data_01
DATAFILE '/oracle/u02/oradata/VShkrabatovskayadb/db_ts_sa_promotions_data_01.dat'
SIZE 200M
AUTOEXTEND ON NEXT 50M
SEGMENT SPACE MANAGEMENT AUTO;

CREATE USER sa_promotions
IDENTIFIED BY "%PWD%"
DEFAULT TABLESPACE ts_sa_promotions_data_01;

GRANT CONNECT,RESOURCE TO sa_promotions;
```

The Script Output pane shows the following messages:

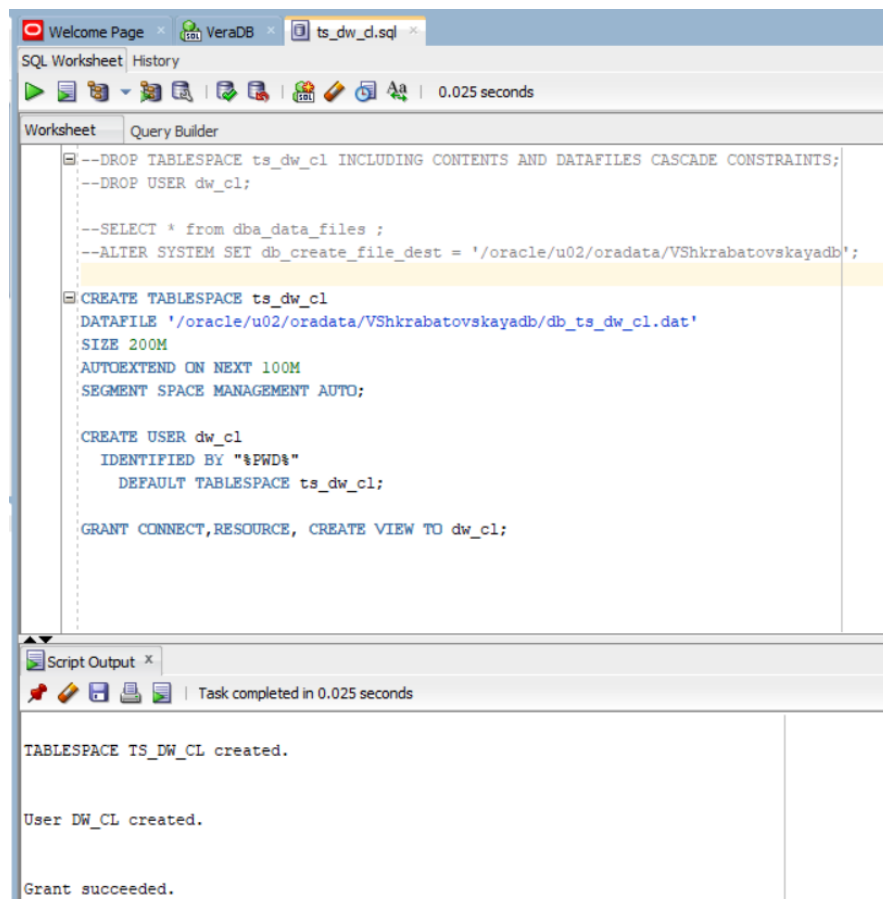
```
TABLESPACE TS_SA_PROMOTIONS_DATA_01 created.

User SA_PROMOTIONS created.

Grant succeeded.
```

2.3. Task 03: CREATE Data warehouse Cleansing Level

Data warehouse cleansing level Objects



The screenshot shows a SQL Worksheet interface with a tab titled 'ts_dw_d.sql'. The SQL commands are as follows:

```
--DROP TABLESPACE ts_dw_cl INCLUDING CONTENTS AND DATAFILES CASCADE CONSTRAINTS;
--DROP USER dw_cl;

--SELECT * from dba_data_files ;
--ALTER SYSTEM SET db_create_file_dest = '/oracle/u02/oradata/VShkrabatovskayadb';

CREATE TABLESPACE ts_dw_cl
DATAFILE '/oracle/u02/oradata/VShkrabatovskayadb/db_ts_dw_cl.dat'
SIZE 200M
AUTOEXTEND ON NEXT 100M
SEGMENT SPACE MANAGEMENT AUTO;

CREATE USER dw_cl
IDENTIFIED BY "%PWD%"
DEFAULT TABLESPACE ts_dw_cl;

GRANT CONNECT,RESOURCE, CREATE VIEW TO dw_cl;
```

The Script Output pane shows the following messages:

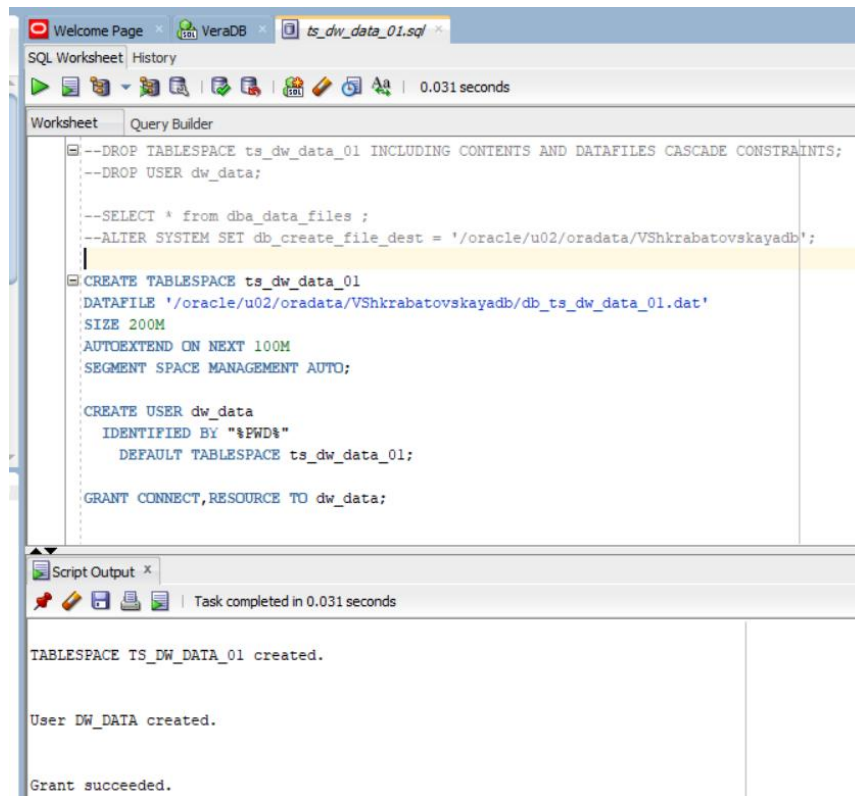
```
TABLESPACE TS_DW_CL created.

User DW_CL created.

Grant succeeded.
```

2.4. Task 04: CREATE Data warehouse Start Cleansing Level

Data warehouse Star Cleansing level Objects



The screenshot shows the SQL Developer interface with a worksheet titled 'ts_dw_data_01.sql'. The SQL script contains the following commands:

```
--DROP TABLESPACE ts_dw_data_01 INCLUDING CONTENTS AND DATAFILES CASCADE CONSTRAINTS;
--DROP USER dw_data;

--SELECT * from dba_data_files ;
--ALTER SYSTEM SET db_create_file_dest = '/oracle/u02/oradata/VShkrabatovskayadb';

CREATE TABLESPACE ts_dw_data_01
DATAFILE '/oracle/u02/oradata/VShkrabatovskayadb/db_ts_dw_data_01.dat'
SIZE 200M
AUTOEXTEND ON NEXT 100M
SEGMENT SPACE MANAGEMENT AUTO;

CREATE USER dw_data
IDENTIFIED BY "%PWD%"
DEFAULT TABLESPACE ts_dw_data_01;

GRANT CONNECT,RESOURCE TO dw_data;
```

The Script Output window shows the following results:

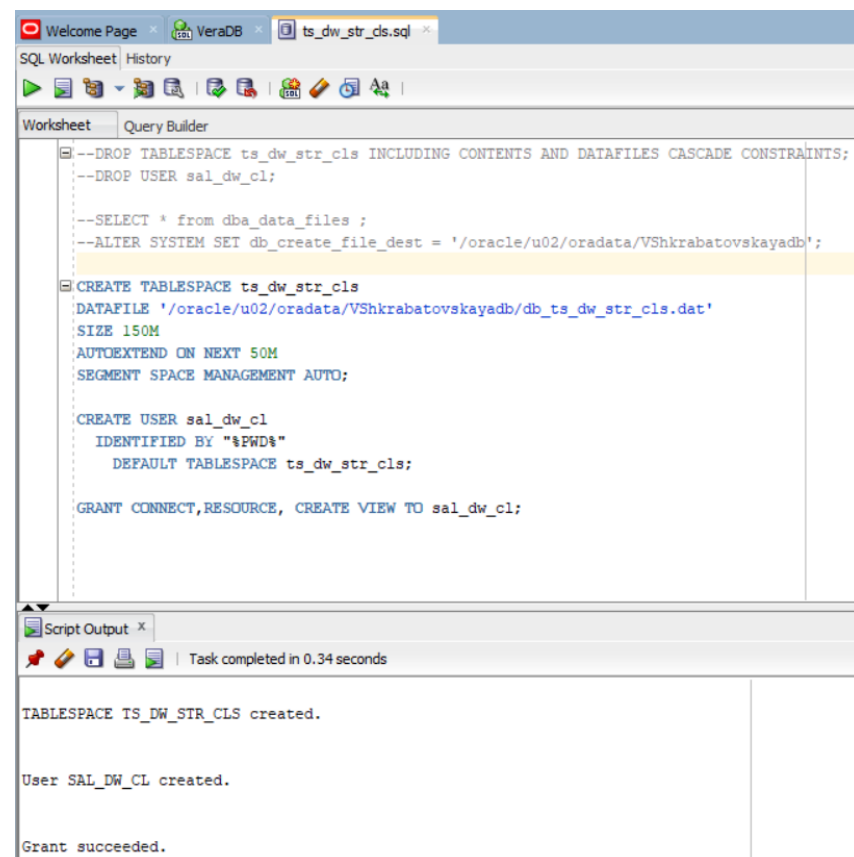
```
TABLESPACE TS_DW_DATA_01 created.

User DW_DATA created.

Grant succeeded.
```

2.5. Task 05: CREATE Start Cleansing Level

Prepare Star Cleansing level Objects



The screenshot shows the SQL Developer interface with a worksheet titled 'ts_dw_str_cls.sql'. The SQL script contains the following commands:

```
--DROP TABLESPACE ts_dw_str_cls INCLUDING CONTENTS AND DATAFILES CASCADE CONSTRAINTS;
--DROP USER sal_dw_cl;

--SELECT * from dba_data_files ;
--ALTER SYSTEM SET db_create_file_dest = '/oracle/u02/oradata/VShkrabatovskayadb';

CREATE TABLESPACE ts_dw_str_cls
DATAFILE '/oracle/u02/oradata/VShkrabatovskayadb/db_ts_dw_str_cls.dat'
SIZE 150M
AUTOEXTEND ON NEXT 50M
SEGMENT SPACE MANAGEMENT AUTO;

CREATE USER sal_dw_cl
IDENTIFIED BY "%PWD%"
DEFAULT TABLESPACE ts_dw_str_cls;

GRANT CONNECT,RESOURCE, CREATE VIEW TO sal_dw_cl;
```

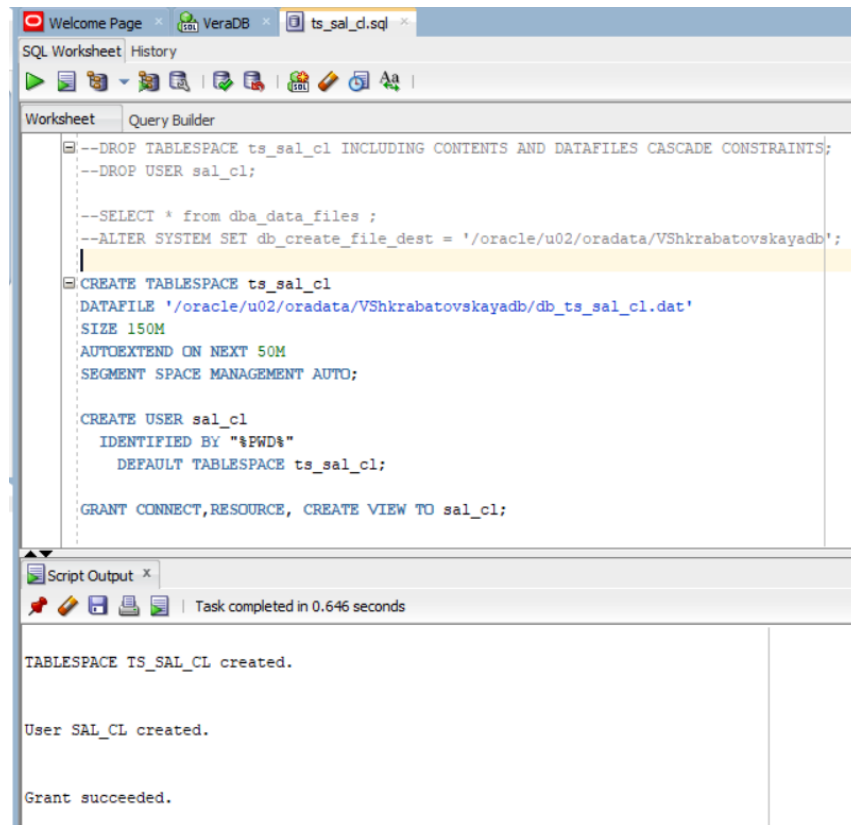
The Script Output window shows the following results:

```
TABLESPACE TS_DW_STR_CLS created.

User SAL_DW_CL created.

Grant succeeded.
```

Star Cleansing level Objects



The screenshot shows the SQL Developer interface with a script titled 'ts_sal_cl.sql'. The script contains the following SQL commands:

```
--DROP TABLESPACE ts_sal_cl INCLUDING CONTENTS AND DATAFILES CASCADE CONSTRAINTS;
--DROP USER sal_cl;

--SELECT * from dba_data_files ;
--ALTER SYSTEM SET db_create_file_dest = '/oracle/u02/oradata/VShkrabatovskayadb';

CREATE TABLESPACE ts_sal_cl
DATAFILE '/oracle/u02/oradata/VShkrabatovskayadb/db_ts_sal_cl.dat'
SIZE 150M
AUTOEXTEND ON NEXT 50M
SEGMENT SPACE MANAGEMENT AUTO;

CREATE USER sal_cl
IDENTIFIED BY "%PWD%"
DEFAULT TABLESPACE ts_sal_cl;

GRANT CONNECT,RESOURCE, CREATE VIEW TO sal_cl;
```

The 'Script Output' pane at the bottom shows the results of the execution:

```
TABLESPACE TS_SAL_CL created.

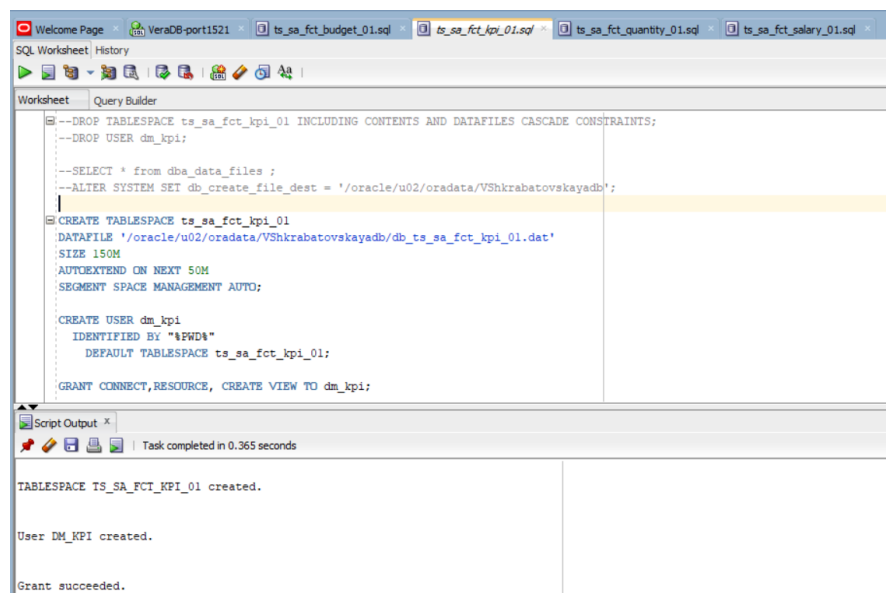
User SAL_CL created.

Grant succeeded.
```

2.6. Task 06: CREATE Data warehouse Start Level and Data Marts

Data warehouse Star and Data Marts level Objects

- s_sa_fct_kpi_01



The screenshot shows the SQL Developer interface with a script titled 'ts_sa_fct_kpi_01.sql'. The script contains the following SQL commands:

```
--DROP TABLESPACE ts_sa_fct_kpi_01 INCLUDING CONTENTS AND DATAFILES CASCADE CONSTRAINTS;
--DROP USER dm_kpi;

--SELECT * from dba_data_files ;
--ALTER SYSTEM SET db_create_file_dest = '/oracle/u02/oradata/VShkrabatovskayadb';

CREATE TABLESPACE ts_sa_fct_kpi_01
DATAFILE '/oracle/u02/oradata/VShkrabatovskayadb/db_ts_sa_fct_kpi_01.dat'
SIZE 150M
AUTOEXTEND ON NEXT 50M
SEGMENT SPACE MANAGEMENT AUTO;

CREATE USER dm_kpi
IDENTIFIED BY "%PWD%"
DEFAULT TABLESPACE ts_sa_fct_kpi_01;

GRANT CONNECT,RESOURCE, CREATE VIEW TO dm_kpi;
```

The 'Script Output' pane at the bottom shows the results of the execution:

```
TABLESPACE TS_SA_FCT_KPI_01 created.

User DM_KPI created.

Grant succeeded.
```

- s_sa_fct_budget_01

The screenshot shows the SQL Developer interface with the 'Worksheet' tab active. The SQL script in the editor includes commands to drop existing tablespaces and users, set the default file destination, create a new tablespace 'ts_sa_fct_budget_01' with a datafile, create a user 'dm_budget' with a password, and grant privileges. The 'Script Output' pane at the bottom shows the successful execution of these commands.

```
--DROP TABLESPACE ts_sa_fct_budget_01 INCLUDING CONTENTS AND DATAFILES CASCADE CONSTRAINTS;
--DROP USER dm_budget;

--SELECT * from dba_data_files ;
--ALTER SYSTEM SET db_create_file_dest = '/oracle/u02/oradata/VShkrabatovskayadb';

CREATE TABLESPACE ts_sa_fct_budget_01
DATAFILE '/oracle/u02/oradata/VShkrabatovskayadb/db_ts_sa_fct_budget_01.dat'
SIZE 150M
AUTOEXTEND ON NEXT 50M
SEGMENT SPACE MANAGEMENT AUTO;

CREATE USER dm_budget
IDENTIFIED BY "%PWD%"
DEFAULT TABLESPACE ts_sa_fct_budget_01;

GRANT CONNECT,RESOURCE, CREATE VIEW TO dm_budget;
```

Script Output x

Task completed in 0.286 seconds

TABLESPACE TS_SA_FCT_BUDGET_01 created.

User DM_BUDGET created.

Grant succeeded.

- s_sa_fct_salary_01

The screenshot shows the SQL Developer interface with the 'Worksheet' tab active. The SQL script in the editor includes commands to drop existing tablespaces and users, set the default file destination, create a new tablespace 'ts_sa_fct_salary_01' with a datafile, create a user 'dm_salary' with a password, and grant privileges. The 'Script Output' pane at the bottom shows the successful execution of these commands.

```
--DROP TABLESPACE ts_sa_fct_salary_01 INCLUDING CONTENTS AND DATAFILES CASCADE CONSTRAINTS;
--DROP USER dm_salary;

--SELECT * from dba_data_files ;
--ALTER SYSTEM SET db_create_file_dest = '/oracle/u02/oradata/VShkrabatovskayadb';

CREATE TABLESPACE ts_sa_fct_salary_01
DATAFILE '/oracle/u02/oradata/VShkrabatovskayadb/db_ts_sa_fct_salary_01.dat'
SIZE 150M
AUTOEXTEND ON NEXT 50M
SEGMENT SPACE MANAGEMENT AUTO;

CREATE USER dm_salary
IDENTIFIED BY "%PWD%"
DEFAULT TABLESPACE ts_sa_fct_salary_01;

GRANT CONNECT,RESOURCE, CREATE VIEW TO dm_salary;
```

Script Output x

Task completed in 0.332 seconds

TABLESPACE TS_SA_FCT_SALARY_01 created.

User DM_SALARY created.

Grant succeeded.

- s_sa_fct_quantity_01

The screenshot shows the SQL Developer interface with the following SQL script in the Worksheet:

```
--DROP TABLESPACE ts_sa_fct_quantity_01 INCLUDING CONTENTS AND DATAFILES CASCADE CONSTRAINTS;
--DROP USER dm_quantity;
--SELECT * from dba_data_files ;
--ALTER SYSTEM SET db_create_file_dest = '/oracle/u02/oradata/VShkrabatovskayadb';

CREATE TABLESPACE ts_sa_fct_quantity_01
DATAFILE '/oracle/u02/oradata/VShkrabatovskayadb/db_ts_sa_fct_quantity_01.dat'
SIZE 150M
AUTOEXTEND ON NEXT 50M
SEGMENT SPACE MANAGEMENT AUTO;

CREATE USER dm_quantity
IDENTIFIED BY "1qWdA"
DEFAULT TABLESPACE ts_sa_fct_quantity_01;

GRANT CONNECT,RESOURCE, CREATE VIEW TO dm_quantity;
```

The Script Output pane shows the following messages:

```
TABLESPACE TS_SA_FCT_QUANTITY_01 created.

User DM_QUANTITY created.

Grant succeeded.
```

3. Star – Business analyses task

3.1. Task 07: CREATE Prepared Star Objects

Data warehouse Star and Data Marts level Objects

- t_DIM_location

The screenshot shows the SQL Developer interface with the following SQL script in the Worksheet:

```
--drop table DIM_location;
--alter session set current_schema = DW_DATA;

CREATE TABLE DIM_location(
country_ID NUMBER(22) GENERATED BY DEFAULT ON NULL AS IDENTITY,
part_desc VARCHAR2(200),
region_desc VARCHAR2(200),
country_desc VARCHAR2(200),

CONSTRAINT "PK_T.DIM_location" PRIMARY KEY(country_ID)
);
```

The Script Output pane shows the following message:

```
Table DIM_LOCATION created.
```


- t_DIM_date

The screenshot shows the SQL Developer interface with the 'Worksheet' tab active. The SQL script in the editor is as follows:

```
1 --drop table DIM_date;
2 --alter session set current_schema = DW_DATA;
3
4 CREATE TABLE DIM_date (
5     date_ID NUMERIC(10) GENERATED BY DEFAULT ON NULL AS IDENTITY,
6     TIME_ID DATE,
7     DAY_NUMBER_IN_YEAR VARCHAR2(3),
8     CALENDAR_WEEK_NUMBER VARCHAR2(1),
9     CALENDAR_MONTH_NUMBER VARCHAR2(2),
10    CALENDAR_QUARTER_NUMBER VARCHAR2(1),
11    CALENDAR_YEAR VARCHAR2(4),
12    DAY_NAME VARCHAR2(44),
13    CALENDAR_MONTH_NAME VARCHAR2(32),
14
15    CONSTRAINT "PK_T.DIM_date" PRIMARY KEY(date_ID)
16 );
```

The 'Script Output' window at the bottom shows the message: 'Table DIM_DATE created.' and 'Task completed in 0.042 seconds'.

- t_DIM_customer

The screenshot shows the SQL Developer interface with the 'Worksheet' tab active. The SQL script in the editor is as follows:

```
--drop table DIM_customer;
--alter session set current_schema = DW_DATA;

CREATE TABLE DIM_customer (
    customer_ID NUMBER(10) GENERATED BY DEFAULT ON NULL AS IDENTITY,
    customer_name VARCHAR2(50),
    brand_name VARCHAR2(50),
    customer_address VARCHAR2(50),
    customer_city VARCHAR2(30),
    customer_country VARCHAR2(30),
    customer_email VARCHAR2(50),
    customer_office_phone VARCHAR2(30),
    customer_mobile_phone VARCHAR2(30),

    CONSTRAINT "PK_T.DIM_customer" PRIMARY KEY(customer_ID)
);
```

The 'Script Output' window at the bottom shows the message: 'Table DIM CUSTOMER created.' and 'Task completed in 0.043 seconds'.

- t_DIM_employee

The screenshot shows a SQL Worksheet interface with a tab for 't_DIM_employee.sql'. The SQL code in the editor is as follows:

```
--drop table DIM_employee;
--alter session set current_schema = DW_DATA;

CREATE TABLE DIM_employee(
  employee_ID NUMBER(10) GENERATED BY DEFAULT ON NULL AS IDENTITY,
  employee_passport_ID VARCHAR2(14),
  employee_first_name VARCHAR2(40),
  employee_last_name VARCHAR2(50),
  employee_position VARCHAR2(50),
  employee_email VARCHAR2(50),
  employee_office_phone VARCHAR2(30),
  employee_mobile_phone VARCHAR2(30),
  department_name VARCHAR2(50),
  agency_name VARCHAR2(50),
  employee_date_of_hire DATE,
  employee_date_of_dismissal DATE,
  employee_salary DECIMAL(30,2),
  CONSTRAINT "PK_T.DIM_employee" PRIMARY KEY(employee_ID)
);
```

The Script Output pane at the bottom shows the message: "Table DIM_EMPLOYEE created."

- t_DIM_agency

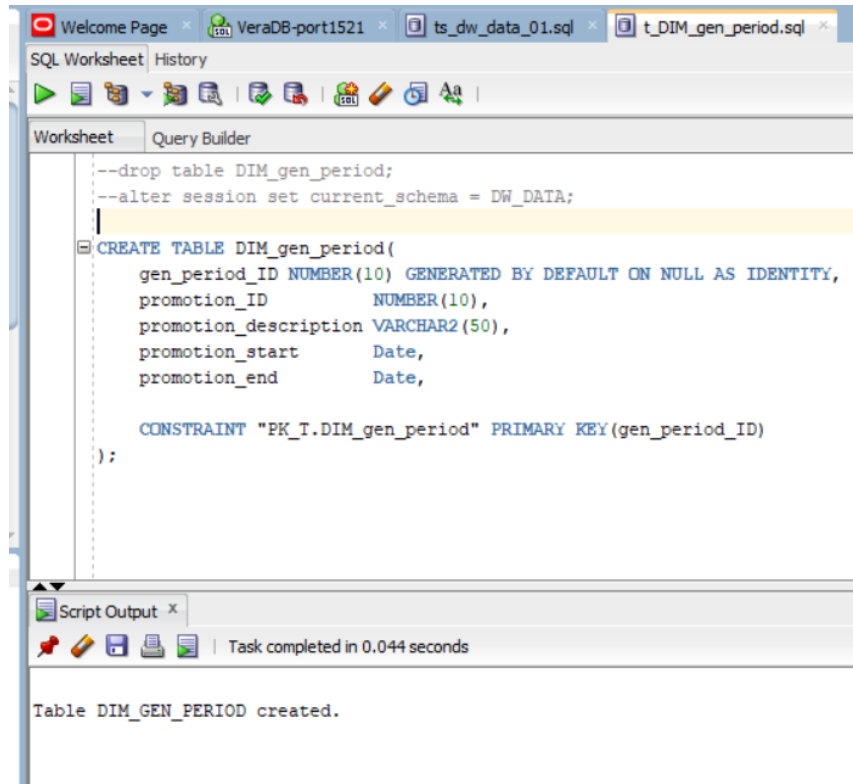
The screenshot shows a SQL Worksheet interface with a tab for 't_DIM_agency.sql'. The SQL code in the editor is as follows:

```
--drop table DIM_agency;
--alter session set current_schema = DW_DATA;

CREATE TABLE DIM_agency(
  agency_ID NUMBER(10) GENERATED BY DEFAULT ON NULL AS IDENTITY,
  agency_name VARCHAR2(50),
  department_name VARCHAR2(50),
  agency_city VARCHAR2(30),
  agency_address VARCHAR2(50),
  agency_postcode VARCHAR2(6),
  agency_email VARCHAR2(30),
  agency_office_phone VARCHAR2(30),
  agency_mobile_phone VARCHAR2(30),
  agency_Fee_percent DECIMAL(10,2),
  agency_VAT_percent DECIMAL(10,2),
  CONSTRAINT "PK_T.DIM_agency" PRIMARY KEY(agency_ID)
);
```

The Script Output pane at the bottom shows the message: "Table DIM_AGENCY created."

- t_DIM_gen_period



The screenshot shows a SQL Worksheet interface with a tab for 't_DIM_gen_period.sql'. The SQL code in the worksheet is as follows:

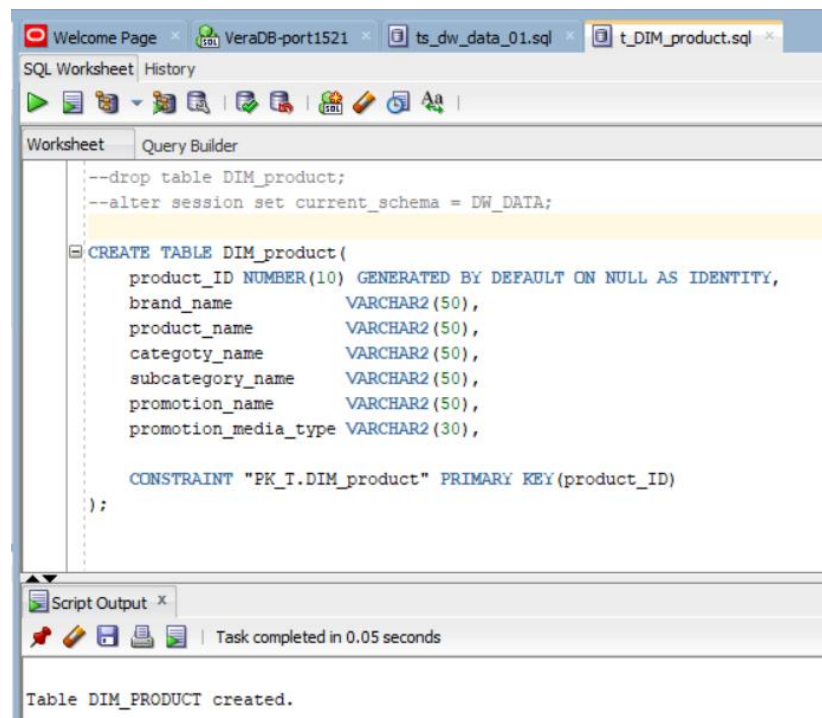
```
--drop table DIM_gen_period;
--alter session set current_schema = DW_DATA;

CREATE TABLE DIM_gen_period(
    gen_period_ID NUMBER(10) GENERATED BY DEFAULT ON NULL AS IDENTITY,
    promotion_ID      NUMBER(10),
    promotion_description VARCHAR2(50),
    promotion_start    Date,
    promotion_end      Date,

    CONSTRAINT "PK_T.DIM_gen_period" PRIMARY KEY(gen_period_ID)
);
```

The Script Output pane at the bottom shows the message: "Table DIM_GEN_PERIOD created." and "Task completed in 0.044 seconds".

- t_DIM_product



The screenshot shows a SQL Worksheet interface with a tab for 't_DIM_product.sql'. The SQL code in the worksheet is as follows:

```
--drop table DIM_product;
--alter session set current_schema = DW_DATA;

CREATE TABLE DIM_product(
    product_ID NUMBER(10) GENERATED BY DEFAULT ON NULL AS IDENTITY,
    brand_name  VARCHAR2(50),
    product_name VARCHAR2(50),
    category_name VARCHAR2(50),
    subcategory_name VARCHAR2(50),
    promotion_name VARCHAR2(50),
    promotion_media_type VARCHAR2(30),

    CONSTRAINT "PK_T.DIM_product" PRIMARY KEY(product_ID)
);
```

The Script Output pane at the bottom shows the message: "Table DIM_PRODUCT created." and "Task completed in 0.05 seconds".

- t_DIM_promotion

```

--drop table DIM_promotion;
--alter session set current_schema = DW_DATA;

CREATE TABLE DIM_promotion(
  promotion_ID NUMBER(10) GENERATED BY DEFAULT ON NULL AS IDENTITY,
  promotion_name          VARCHAR2(50),
  promotion_media_type    VARCHAR2(30),
  promotion_metric_amount DECIMAL(10,2),
  department_name         VARCHAR2(50),
  promotion_price         DECIMAL(10,2),
  promotion_KPI           VARCHAR2(30),
  promotion_distinct_percent DECIMAL(10,2),

  CONSTRAINT "FK_I_DIM_promotion" PRIMARY KEY(promotion_ID)
);

```

Script Output: Task completed in 0.05 seconds

Table DIM_PROMOTION created.

- t_FCL_business

```

--drop table FCT_business;
--alter session set current_schema = DW_DATA;

CREATE TABLE FCT_business(
  Business_Fact_ID NUMBER(10) GENERATED BY DEFAULT ON NULL AS IDENTITY,
  country_ID        NUMBER(10),
  date_ID           NUMBER(10),
  customer_ID       NUMBER(10),
  employee_ID       NUMBER(10),
  agency_ID         NUMBER(10),
  gen_period_ID     NUMBER(10),
  product_ID        NUMBER(10),
  promotion_ID      NUMBER(10),
  gross_profit_dollar_amount DECIMAL(30,2),
  net_profit_dollar_amount  DECIMAL(30,2),
  gross_revenue_dollar_amount DECIMAL(30,2),
  net_revenue_dollar_amount DECIMAL(30,2),
  gross_cost_dollar_amount  DECIMAL(30,2),
  net_cost_dollar_amount    DECIMAL(30,2),
  gross_salary_employee_dollar_amount DECIMAL(30,2),
  net_salary_employee_dollar_amount DECIMAL(30,2),
  customer_quantity DECIMAL(30,2),
  employee_quantity  DECIMAL(30,2),
  promotion_quantity DECIMAL(30,2),
  revenue_cost_percent DECIMAL(10,2),

  CONSTRAINT "FK_I_FCT_business" PRIMARY KEY(Business_Fact_ID)
);

```

Script Output: Task completed in 0.052 seconds

Table FCT_BUSINESS created.

```

ALTER TABLE FCT_business
  ADD CONSTRAINT "FK_FCT_business_DIM_date" FOREIGN KEY (date_ID) REFERENCES dim_date (date_ID);

ALTER TABLE FCT_business
  ADD CONSTRAINT "FK_FCT_business_DIM_customer" FOREIGN KEY (customer_ID) REFERENCES dim_customer (customer_ID);

ALTER TABLE FCT_business
  ADD CONSTRAINT "FK_FCT_business_DIM_employee" FOREIGN KEY (employee_ID) REFERENCES dim_employee (employee_ID);

ALTER TABLE FCT_business
  ADD CONSTRAINT "FK_FCT_business_DIM_agency" FOREIGN KEY (agency_ID) REFERENCES dim_agency (agency_ID);

ALTER TABLE FCT_business
  ADD CONSTRAINT "FK_FCT_business_DIM_gen_period" FOREIGN KEY (gen_period_ID) REFERENCES dim_gen_period (gen_period_ID);

ALTER TABLE FCT_business
  ADD CONSTRAINT "FK_FCT_business_DIM_product" FOREIGN KEY (product_ID) REFERENCES dim_product (product_ID);

ALTER TABLE FCT_business
  ADD CONSTRAINT "FK_FCT_business_DIM_promotion" FOREIGN KEY (promotion_ID) REFERENCES dim_promotion (promotion_ID);

```

Script Output: Task completed in 0.126 seconds

Table FCT_BUSINESS altered.

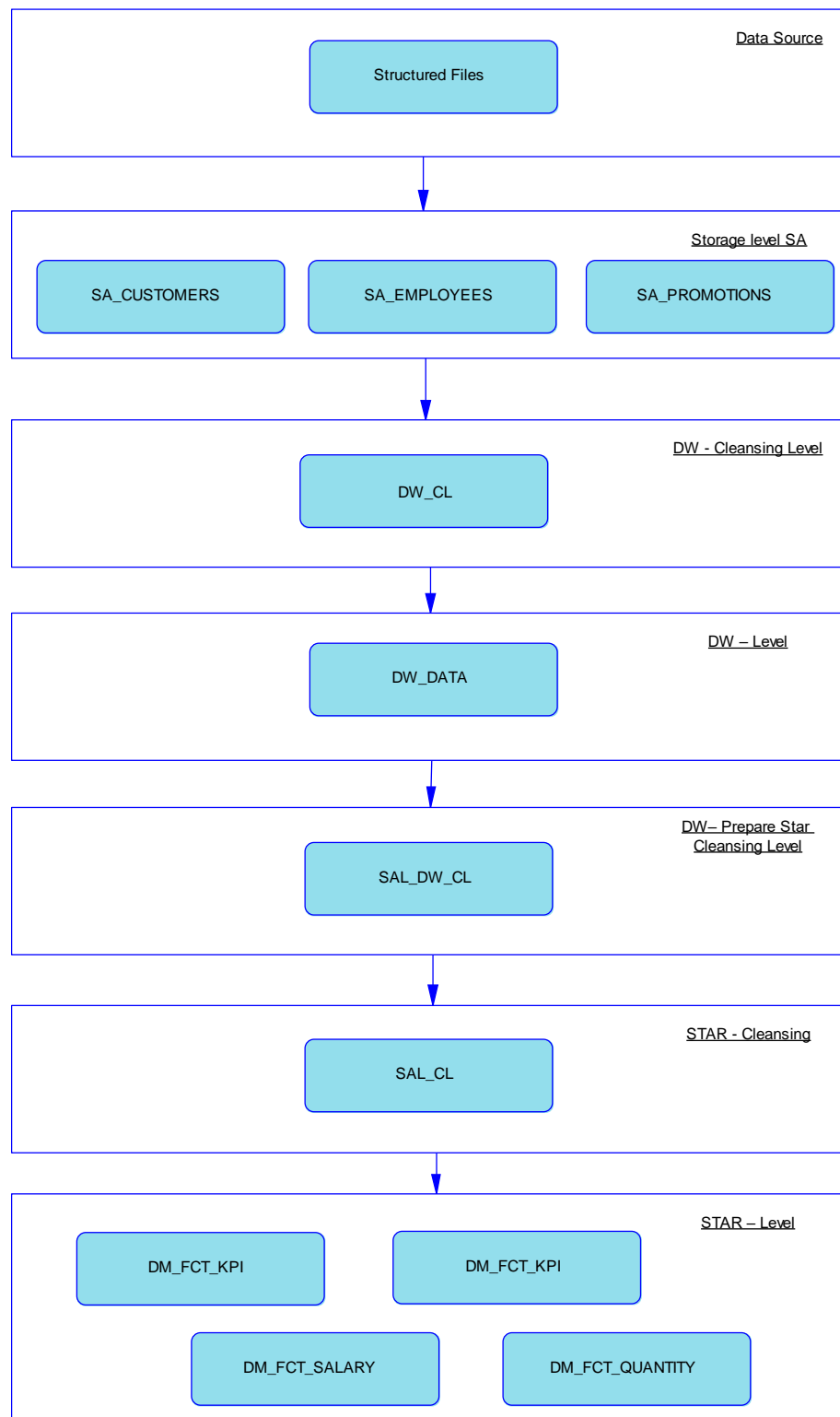
Table FCT_BUSINESS altered.

Table FCT_BUSINESS altered.

Table FCT_BUSINESS altered.

3.2. Task 08: DataFlow Diagram

DataFlow Diagram to describe refresh process of Business STAR



3.3. Task 09: Grants Object Privileges

All privileges to DW_CL, SAL_CL_DW, SAL_CL layers were granted in steps 2.3. Task 03, 2.5. Task 05.