SRI LANKA INSTITUE OF INFORMATION TECHNOLOGY (SLIIT)

IT3021 – DATA WAREHOUSE AND BUSINESS INTELLIGENCE

ASSIGNMENT – 01

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1. Dataset Selection and Introduction

1.1. Introduction to Dataset

The dataset represents information about a collection of an anonymized financial information from a bank in **Czech Republic** to mine and analyze this bank data in order to extrapolate from it the type of customer who makes a good candidate for a credit card. The dataset has been modified to develop a scenario that meets the requirements of the assignment. The transactional details made on an Account, the details of Clients involved in an Account, the Account details, Loan, and Permanent Order details are some of the information that are available through the dataset.

1.2. Features of the dataset

- **Account:** each record describes static characteristics of an account. (4500 records in the file)
- **Client:** each record describes characteristics of a client. (5369 records in the file)
- **Disposition:** each record relates together a **Client** with an **Account**. This relation describes the rights of clients to operate accounts. (5369 records in the file)
- **Permanent Order:** each record describes characteristics of a payment orders. (6471 records in the file)
- **Credit Card:** each record describes a credit card issued to an account. (892 records in the file)
- **Loan:** each record describes a loan granted for a given account. (682 records in the file)
- **Transaction:** each record describes one transaction on an account. (1056320 records in the file, but get only 50000)
- **District:** each record describes demographic characteristics of a district. (77 records in the file)
- Each account has both static characteristics (date of creation, address of the branch) given in relation "**Account**" and dynamic characteristics (payments debited or credited, balances) given in relations "**Permanent Order**" and "**Transaction**".
- Relation "**Client**" describes characteristics of persons who can manipulate with the accounts. One client can have more accounts, more clients can manipulate with single account; clients and accounts are related together in relation "**Disposition**".
- Relations "**Loan**" and "**Credit Card**" describe some services which the bank offers to its clients; more credit cards can be issued to an account, at most one loan can be granted for an account.
- Relation "**District**" gives some publicly available information about the districts. Additional information about the clients can be deduced from this.

1.3. Link to Access Dataset

https://data.world/lpetrocelli/retail-banking-demo-data

2. Preparation of Data Source

The collected dataset was analyzed and modified according to the requirements of the project. The primary link contains 8 csv files. Some additional information was added to few relations in order to achieve the missing requirements.

Ultimately, 2 main sources were created:

1. **Database source**: CreditCardAnalysis_SourceDB
2. **Text file to maintain district data**: Client.csv, ClientAddress.csv

Assumption:

No client address details were provided in the data set. The bank might require the address details of the clients for contact purposes. Therefore, another CSV file was created to keep track of these details. Further, it was required to meet the requirement of the assignment

A database named **CreditCardAnalysis_SourceDB** was created in SQL and the below mentioned files were imported:

- ✓ Account.csv
- ✓ Transaction.csv
- ✓ District.csv
- ✓ CreditCard.csv
- ✓ Disposition.csv
- ✓ Loan.csv
- ✓ PermenantOrder.csv

CreditCardAnalysis_StagingDB database was created as a Staging layer.

For data warehousing purposes a database named **CreditCardAnalysis_DW** was created in SQL, including the dimensions and fact tables mentioned below.

- ✓ DimClient
- ✓ DimAccount
- ✓ DimDisposition
- ✓ DimDistrict
- ✓ DimLoan
- ✓ DimCreditCard
- ✓ DimPermenantOrder
- ✓ DimDate
- ✓ FactTransaction

7.2. Dimension Creation Queries

3. ER Diagram

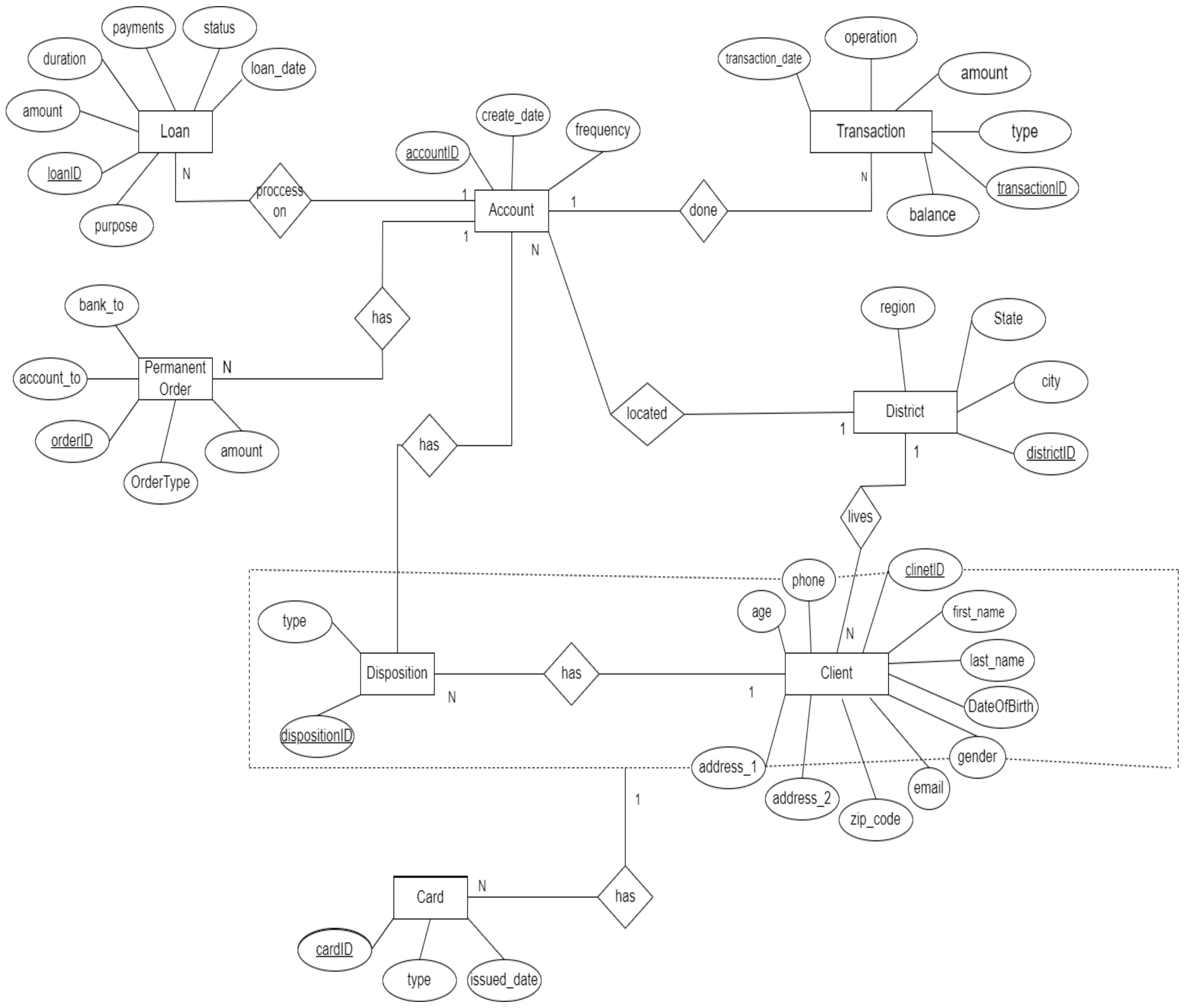


Figure 1. ER Diagram

4. Solution Architecture

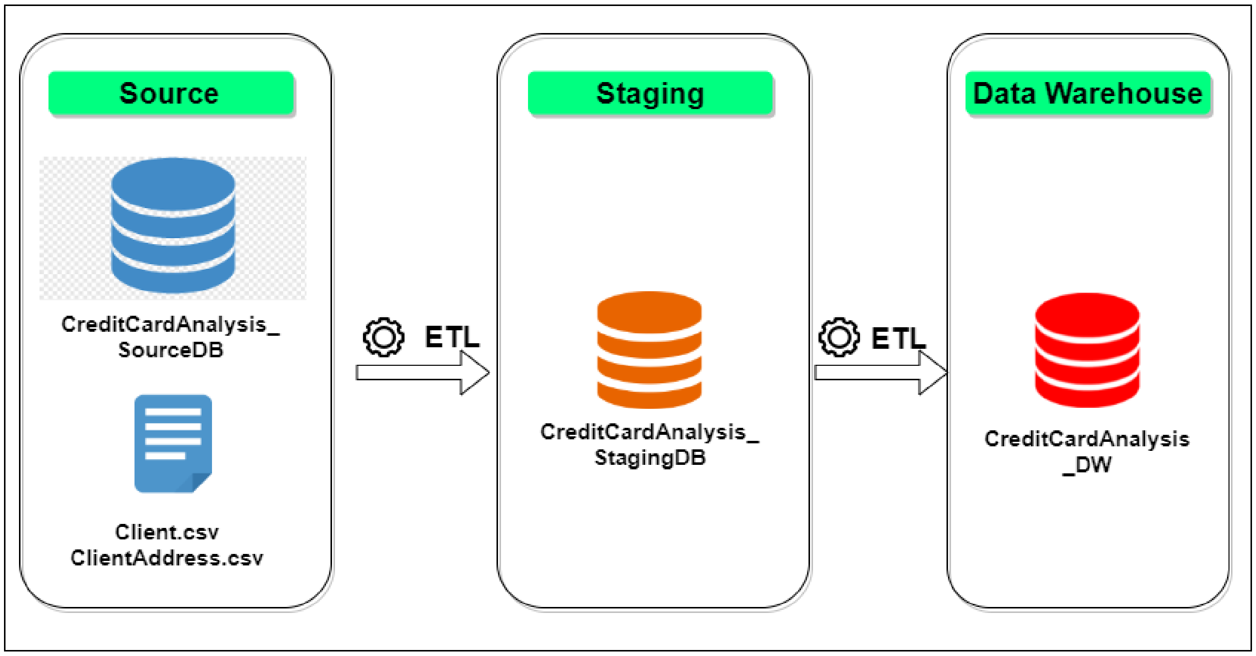


Figure 2. Solution Architecture

Date Sources:

- ❖ Several data sources can be available when implementing a data warehouse solution. Sources are simply the origin of location of the used data. A data source may be a database, flat file, live measurements from physical device, scraped web data, etc. Here, a database source namely '**CreditCardAnalysis_SourceDB**' serves as the primary data source and a flat file source namely '**District.txt**' serves as a secondary data source.

ETL:

- ❖ ETL is the abbreviation for the standard '**Extraction-Transformation-Loading**.' It is the process of extracting data from one source, transform those data and finally load them to a destination. The extraction process followed here is a full extraction (Load all data in the source without filtering conditions). While performing the ETL process to load data to data warehouse, necessary steps like cleaning and aggregation were performed.

Staging Layer:

- ❖ This is an intermediate storage layer. This layer is added to prevent practical problems that could arise while transforming data to data warehouse. It is similar to the data source but contains all the data required for warehousing in a centralized location. A less amount of transformation is performed during the ETL process from source to staging.
- ❖ '**CreditCardAnalysis_StagingDB**' is the database created as a staging layer in the scenario.

Data Warehouse:

- ❖ Data warehouse is a large collection of business data. Aggregated and transactional data are stored here for analytical purposes. It is a core component of business intelligence. A database named '**CreditCardAnalysis_DW**' is created in SQL as the data warehouse layer.

5. Data Warehouse Design and Implementation.

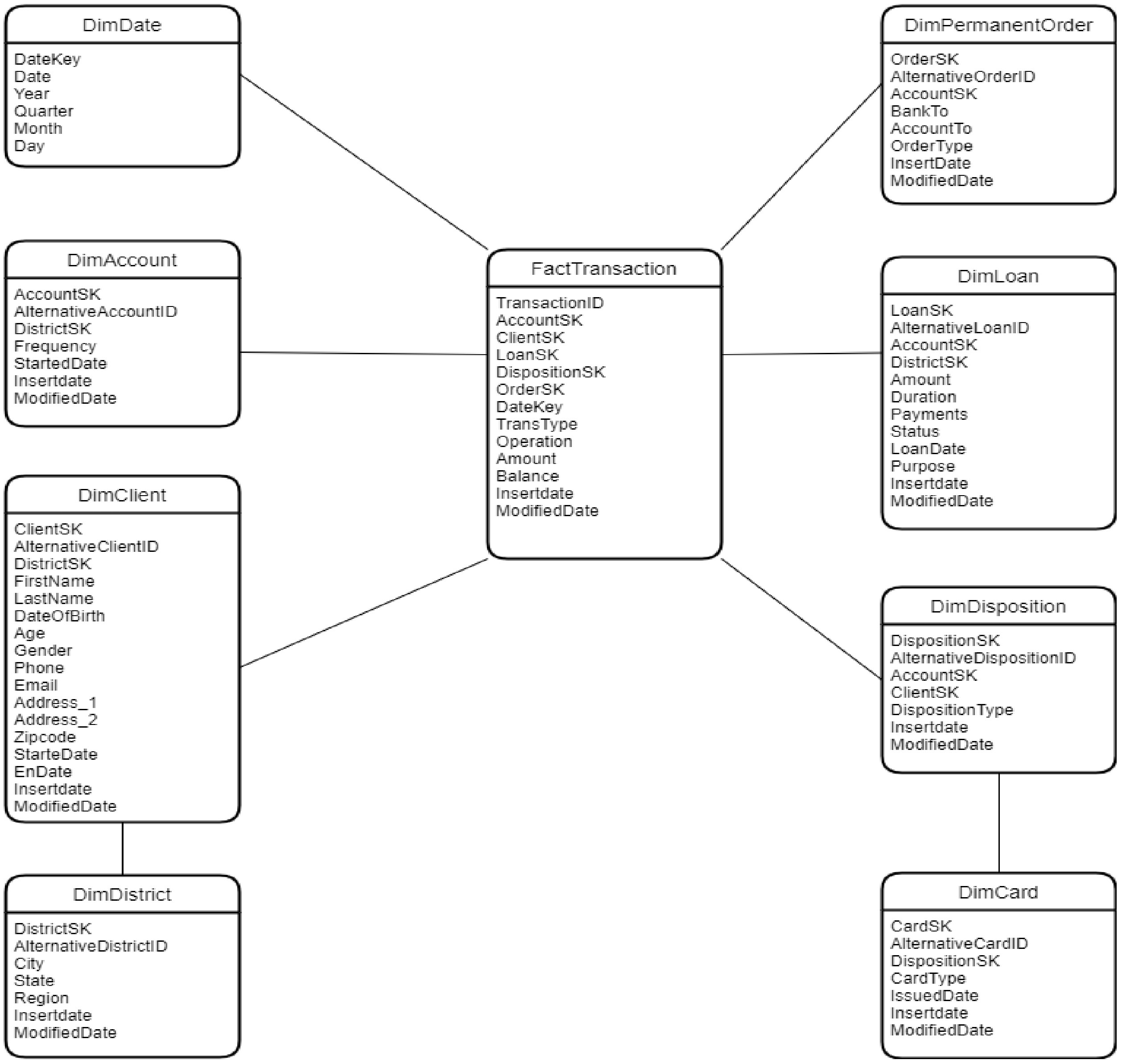


Figure 3. SnowFlake Schema

- The data warehouse design was implemented using the **Snowflake schema**. Snowflake schema is an extension of Star schema and consists of some dimensions that are normalized. According to the schema above, there are **8 Dimensions** and **1 Fact table**. The **District** dimension contains hierarchical data. The schema was designed considering the transactions per date as the level of grain.
- **Assumption**:
  Client dimension is considered as a **Slowly Changing Dimension**(SCD).

6. ETL Development

6.1. Data Extraction from Source to Staging

As the initial step, the data from sources were extracted to a staging layer. These data were then transformed and loaded to the staging tables. The data flow task was used to perform this process.

Source table and staging tables are as below:

Source Tables	Staging Tables
Account	StgAccount
District	StgDistrict
Disposition	StgDisposition
Card	StgCard
PermanentOrder	StgPermanentOrder
Loan	StgLoan
AccountTransaction	StgAccountTransaction
Client.csv	StgClient
ClientAddress.csv	StgClientAddress

Control Flow Task:

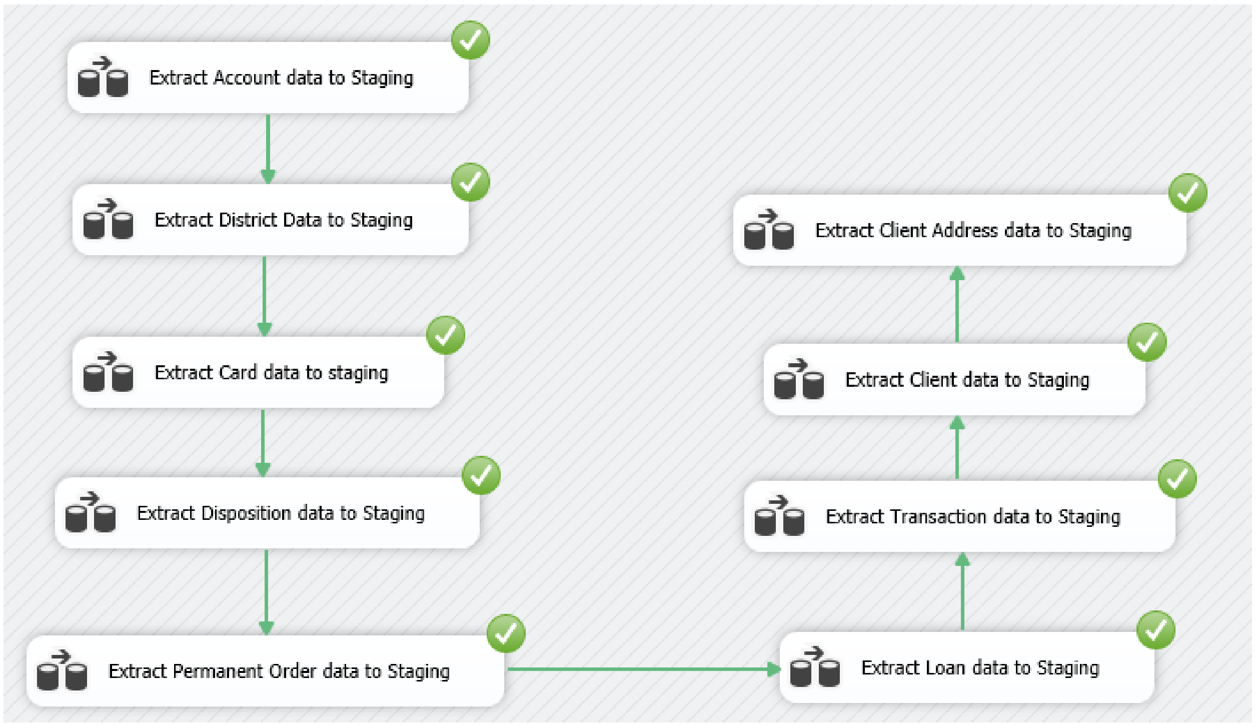

Extract Account data to Staging
Extract District Data to Staging
Extract Card data to staging
Extract Disposition data to Staging
Extract Permanent Order data to Staging
Extract Loan data to Staging
Extract Transaction data to Staging
Extract Client data to Staging
Extract Client Address data to Staging

Figure 4. Control Flow Task for Staging

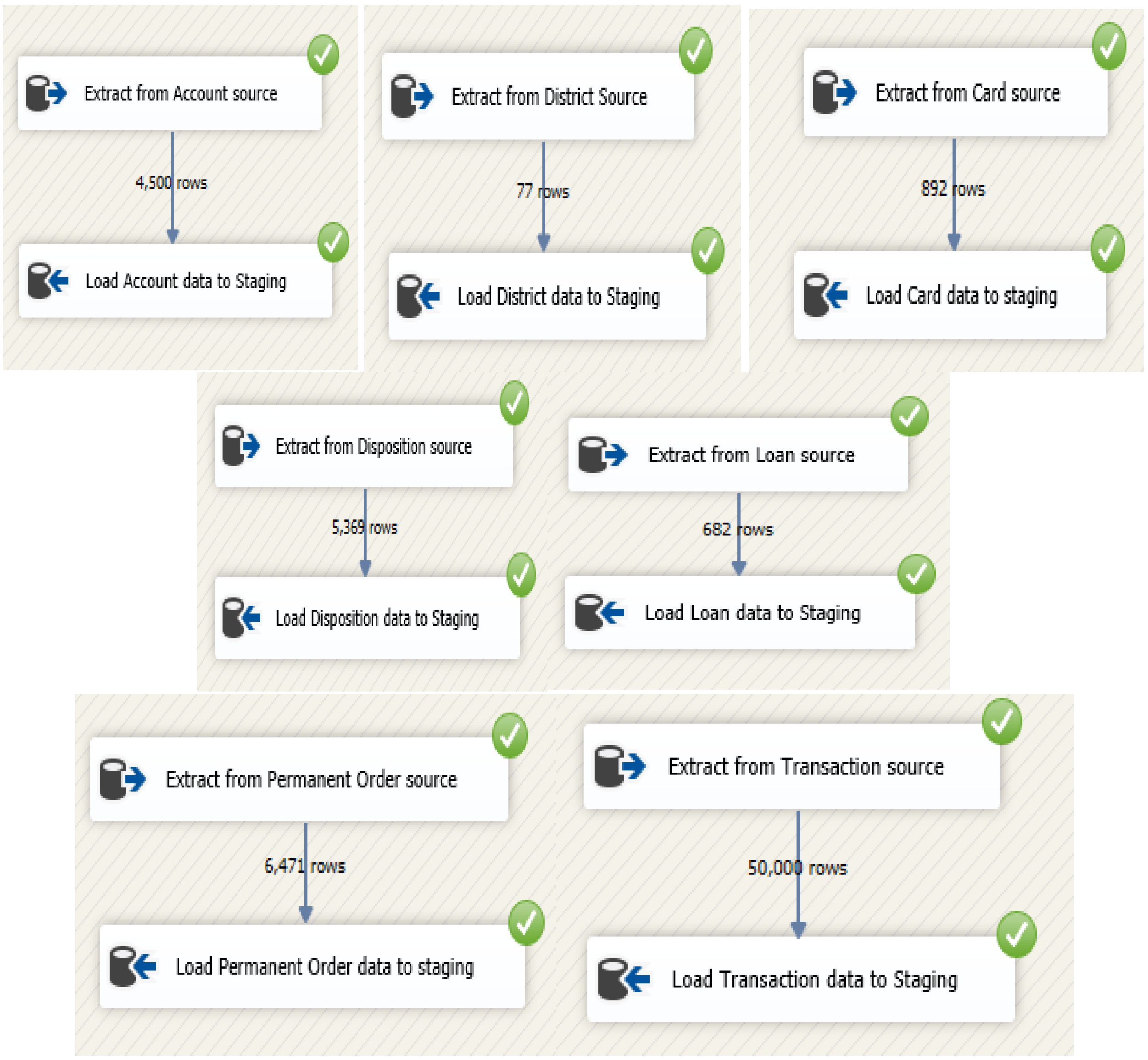

Extract from Account source
4,500 rows
Load Account data to Staging
Extract from District Source
77 rows
Load District data to Staging
Extract from Card source
892 rows
Load Card data to staging
Extract from Disposition source
5,369 rows
Load Disposition data to Staging
Extract from Loan source
682 rows
Load Loan data to Staging
Extract from Permanent Order source
6,471 rows
Load Permanent Order data to staging
Extract from Transaction source
50,000 rows
Load Transaction data to Staging

Figure 5. Staging from a database source to database destination

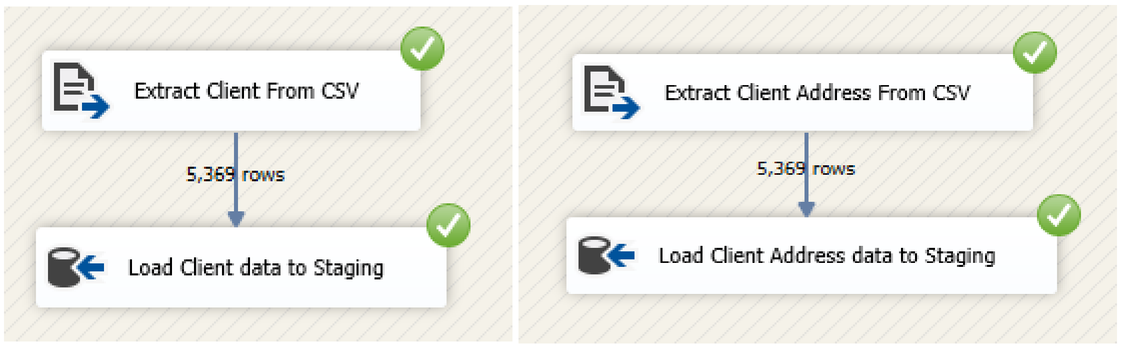

Extract Client From CSV
5,369 rows
Load Client data to Staging
Extract Client Address From CSV
5,369 rows
Load Client Address data to Staging

Figure 6. Staging from a Flat File source to database destination

6.2. Data Profiling

Data profiling is the process of reviewing data to understand the structure, content and inter relationships. It uncovers the issues related to data quality that can be corrected in ETL process.

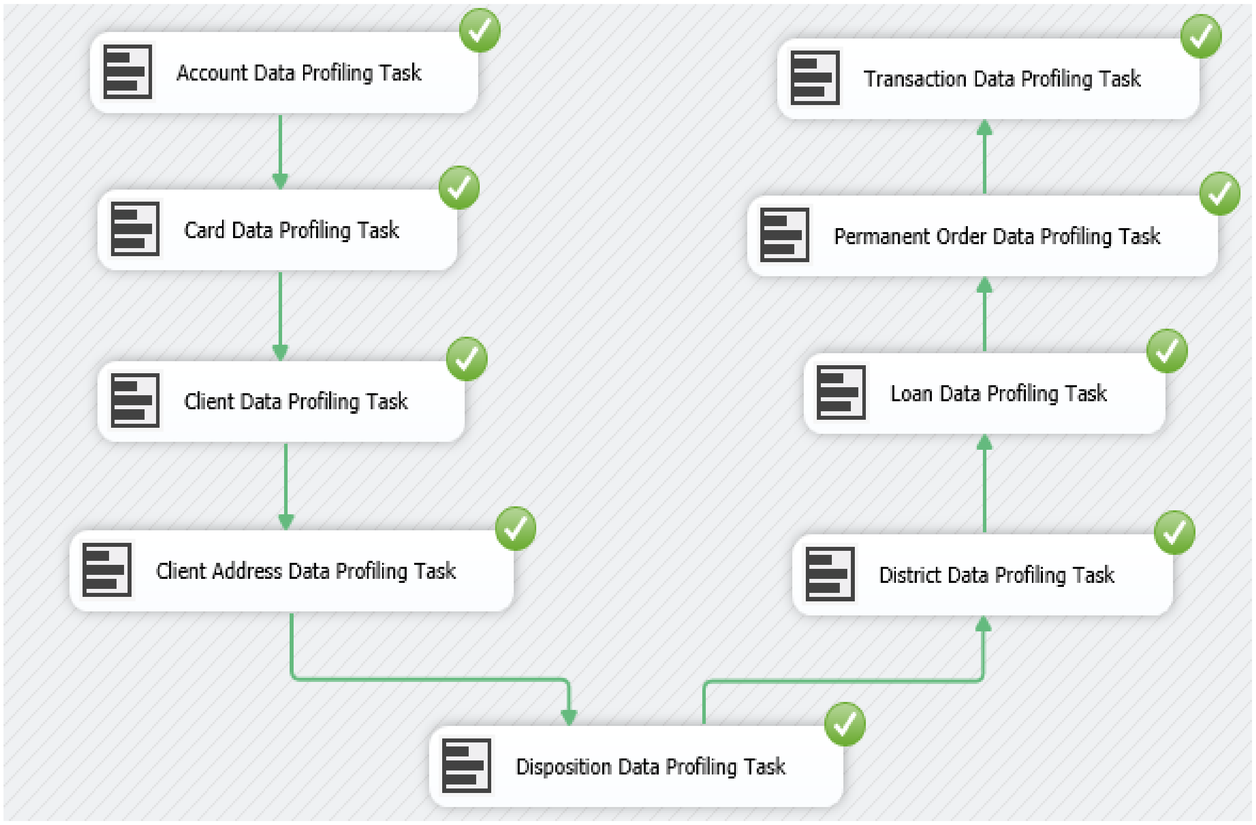

Account Data Profiling Task
Card Data Profiling Task
Client Data Profiling Task
Client Address Data Profiling Task
Disposition Data Profiling Task
District Data Profiling Task
Loan Data Profiling Task
Permanent Order Data Profiling Task
Transaction Data Profiling Task

Figure 7. Data Profiling Task Flow

6.3. Transform and Load Data to Datawarehouse

When loading data from staged layer to Data Warehouse, the order of execution is very important. The reason for this is that the dimensions and facts contain dependencies with each other:

The order of execution is shown below in the control flow task of ETL:

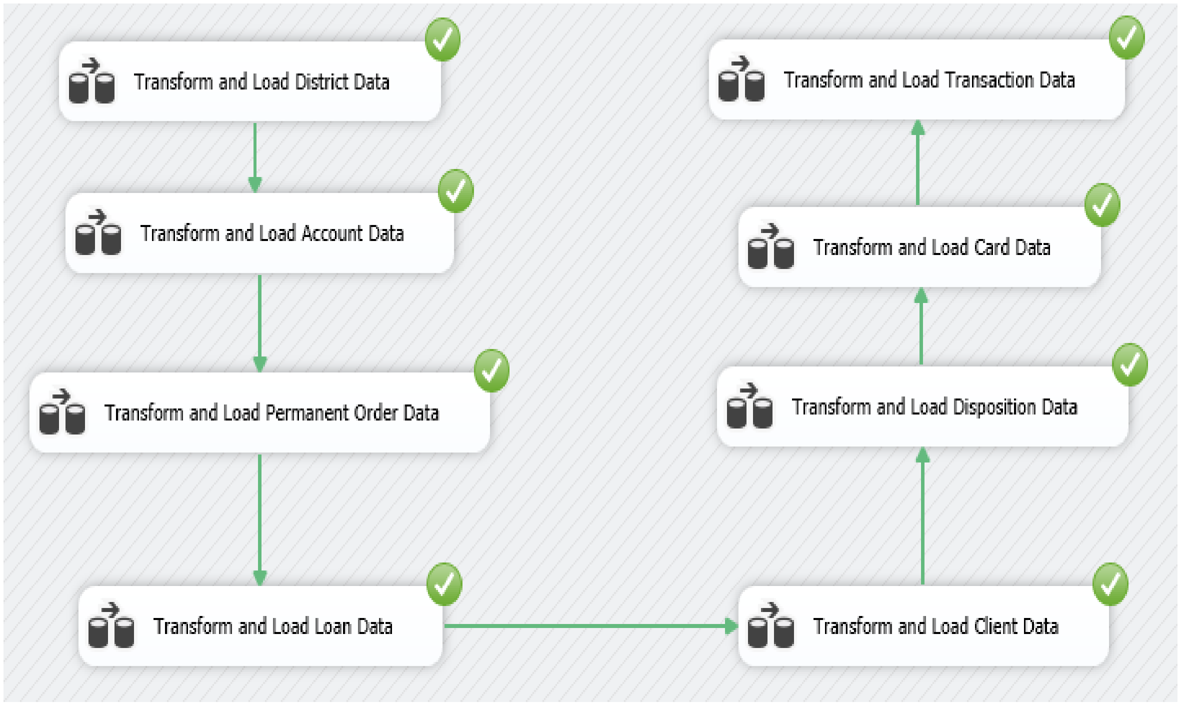

Transform and Load District Data
Transform and Load Account Data
Transform and Load Permanent Order Data
Transform and Load Loan Data
Transform and Load Client Data
Transform and Load Disposition Data
Transform and Load Card Data
Transform and Load Transaction Data

Figure 8. Control flow task of Data warehouse Transformation and Loading

1. Loading District Data to DimDistrict

The **District** dimension has no dependencies with any other dimensions; therefore, it is loaded first

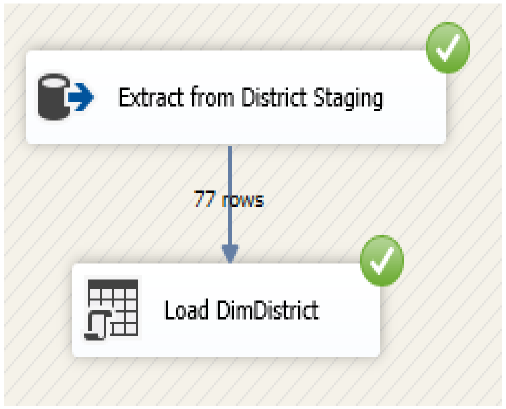


Figure 9. Data flow task of District Dimension Transformation and Loading

2. Loading Account Data to DimAccount

Both **Account** and **Client** Data can be loaded next since they contain reference to the **District**.

Here, the **Account** dimension is loaded as the next dimension.

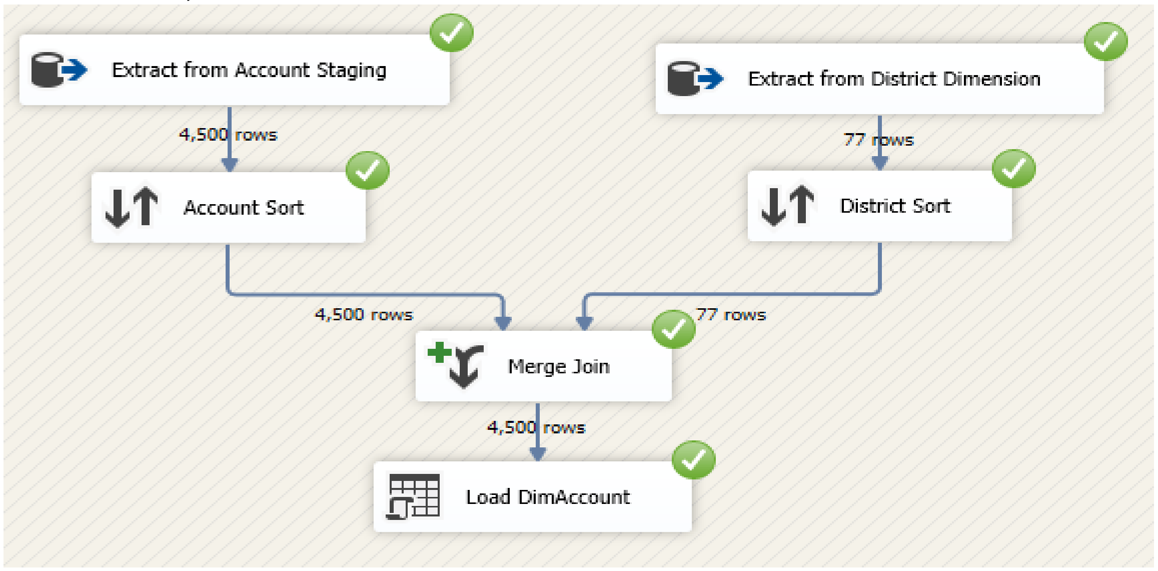
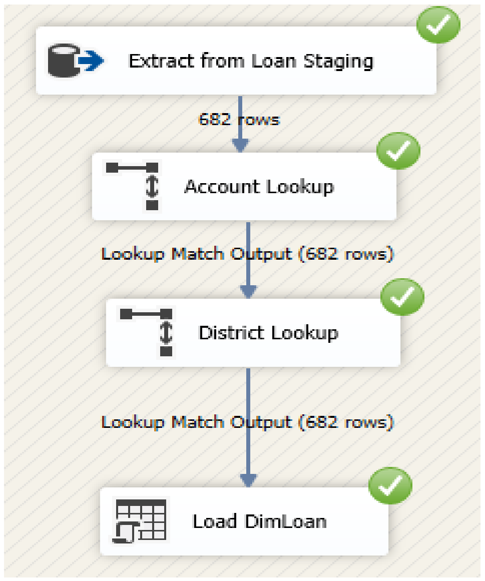


Figure 10. Data flow task of Account Dimension transformation and loading

DimAccount contains a reference to **DimDistrict**. In order to get the **District** surrogate key to account dimension, data was extracted from both dimensions and sorted based on **District ID**. Then they were merged to load into **DimAccount**. Some Accounts may not have a District ID; thus, the Merge join was done using left outer join.

3. Loading Loan Data to DimLoan

Loan and **Permanent Order** contain reference to **Account**;
Therefore, **Loan** dimension is loaded following **Account**, followed by the **Permanent Order** dimension.



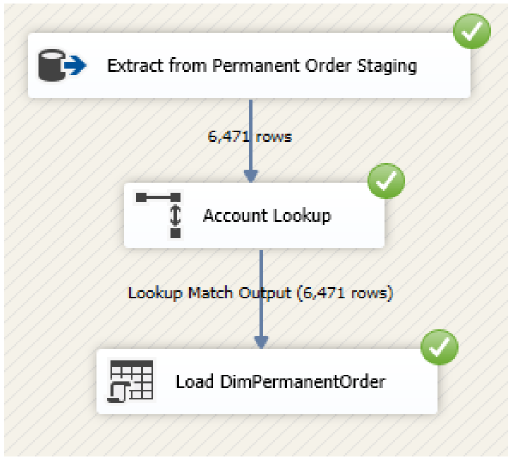
Extract from Loan Staging
682 rows
Account Lookup
Lookup Match Output (682 rows)
District Lookup
Lookup Match Output (682 rows)
Load DimLoan

Figure 11. Data flow task of Loan Dimension transformation and loading

Loan dimension contains a reference to **Account** and **District** dimension. In order to get the surrogate keys of **Account** and **District** to **Loan** dimension a lookup process was performed.

4. Loading Permanent Data to DimPermanentOrder

Permanent Order Dimension loaded following Loan



Extract from Permanent Order Staging
6,471 rows
Account Lookup
Lookup Match Output (6,471 rows)
Load DimPermanentOrder

Figure 12. Data flow task of Permanent Order Dimension Transformation and Loading

Permanent Order dimension contains a reference to **Account** dimension. In order to get the surrogate key of **Account** to **Permanent Order** dimension a lookup process was performed.

5. Loading Client Data to DimClient

Next, the **Client** dimension is loaded.

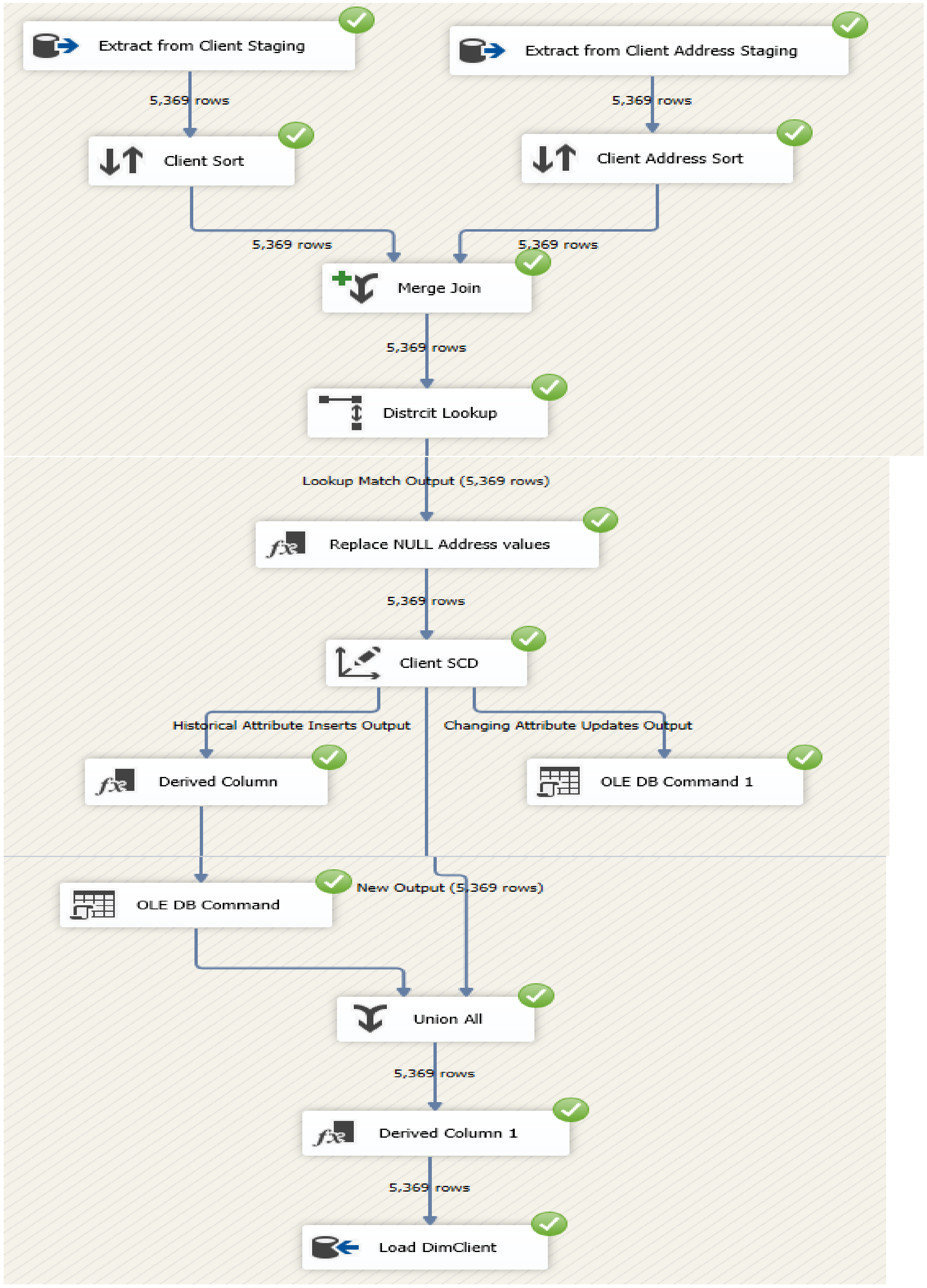


Figure 13. Data Flow task of Client Dimension Transformation and Loading

DimClient contains the **Client Address** details as well as other **Client** details together. Therefore, the Client Data was extracted from both **Client staging** and **Client Address Staging**, sorted, and merged. **Client** dimension contains a reference to the **District**. In order to get the **District** surrogate key a lookup process was created. Next, the null values of the address_2 fields were replaced. **Client** is a **Slowly Changing Dimension**.

Therefore, following attributes were set as **changing attributes** and **historical attributes**.

- ✓ Phone – changing attribute
- ✓ Address_1 – historical attribute
- ✓ Address_2 – historical attribute
- ✓ Zipcode – historical attribute
- ✓ DistrickSK – historical attribute

After performing these tasks, the **Client** dimension was loaded.

6. Loading Disposition Data to DimDisposition

Disposition dimension contains reference to both **Client** and **Account** dimensions. On that basis its loaded next after the loading of both **Client** and **Account**.

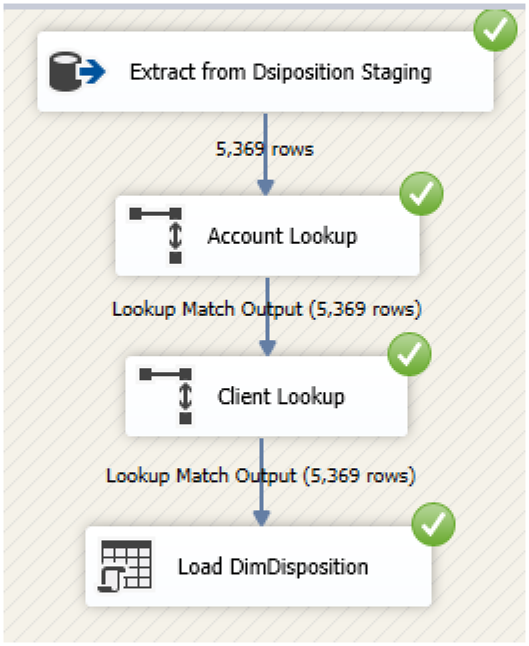

Extract from Dsiposition Staging
5,369 rows
Account Lookup
Lookup Match Output (5,369 rows)
Client Lookup
Lookup Match Output (5,369 rows)
Load DimDisposition

Figure 14. Data flow task of Disposition Dimension Transformation and Loading

Disposition dimension contains a reference to **Account** and **Client** dimension. In order to get the surrogate keys of **Account** and **Client** to **Disposition** dimension a lookup process was performed.

7. Loading Card Data to DimCard

Card dimension contains reference to the **Disposition**. Thus, its loaded after **Disposition**.

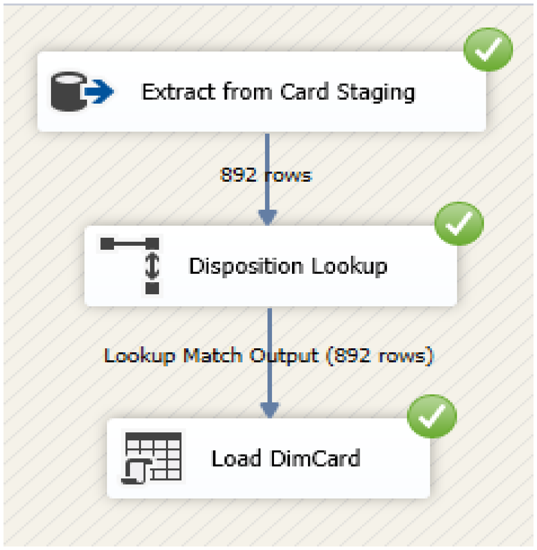


Figure 15. Data flow task of Card Dimension Transformation and Loading

Card dimension contains a reference to **Disposition** dimension. In order to get the surrogate key of **Disposition** to **Card** dimension a lookup process was performed.

8. Loading Transaction Data to FactTransaction

Finally, the **Fact Transaction** is loaded as it contains references to many other dimensions.

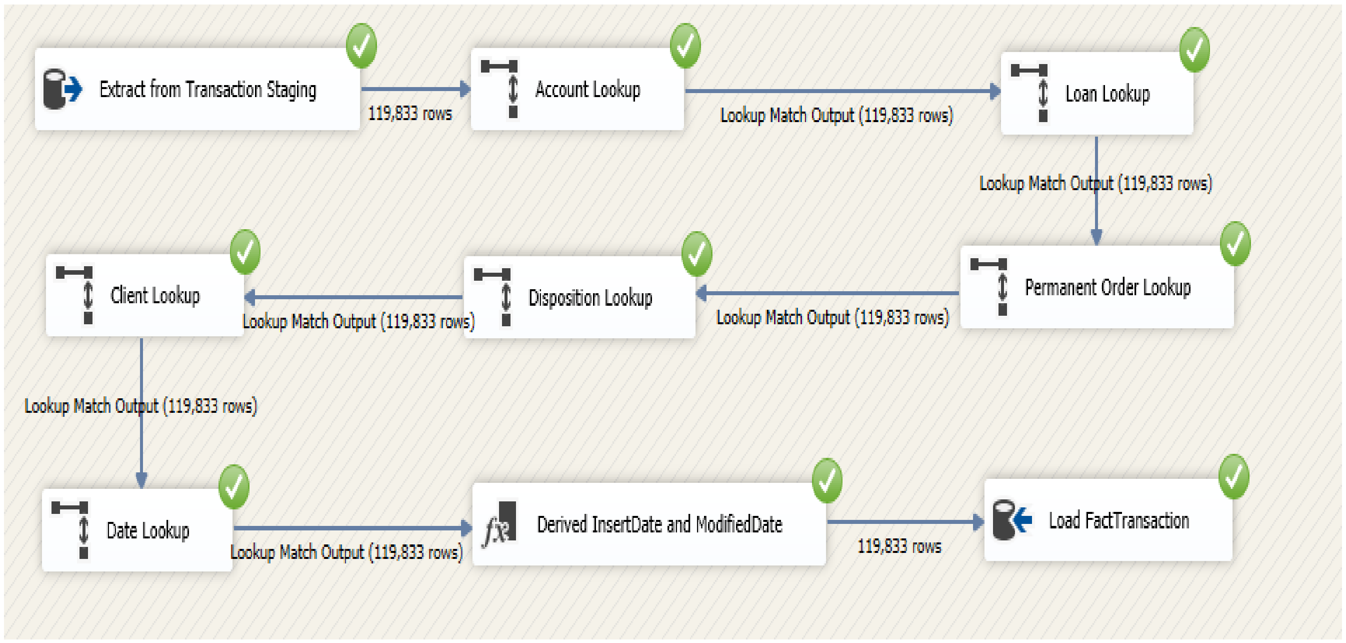

Extract from Transaction Staging
119,833 rows
Account Lookup
Lookup Match Output (119,833 rows)
Loan Lookup
Lookup Match Output (119,833 rows)
Permanent Order Lookup
Lookup Match Output (119,833 rows)
Disposition Lookup
Lookup Match Output (119,833 rows)
Client Lookup
Lookup Match Output (119,833 rows)
Date Lookup
Lookup Match Output (119,833 rows)
Derived InsertDate and ModifiedDate
119,833 rows
Load FactTransaction

Figure 16. Data Flow task of Transaction Fact Transformation and Loading

The **Fact Transaction** contains references to **Account**, **Loan**, **Permanent Order**, **Disposition**, **Client**, and **Date**. In order to get the surrogate keys as references, lookup processes were carried out for all references. Insert date and modified date are derived columns. Finally, the fact table was loaded to its destination.

- ✓ Dimensions like Account, Loan, Permanent Order, District, Disposition and Card does not maintain history. Therefore, in order to maintain the latest record, stored procedures were created. 7.3 Stored Procedure Queries

7. Appendix

7.1. Dimension and Fact Tables Creation

```
-- Create DimAccount Table --

CREATE TABLE [dbo].[DimAccount](
	[AccountSK] [int] IDENTITY(1,1) NOT NULL,
	[AlternativeAccountID] [varchar](10) NOT NULL,
	[DistrictSK] [int] NULL,
	[Frequency] [varchar](50) NULL,
	[StartedDate] [date] NULL,
	[InsertDate] [datetime] NULL,
	[ModifiedDate] [datetime] NULL,
 CONSTRAINT [PK_DimAccount] PRIMARY KEY CLUSTERED
(
	[AccountSK] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF,
ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON) ON [PRIMARY]
) ON [PRIMARY]



-- Create DimCard Table --

CREATE TABLE [dbo].[DimCard](
	[CardSK] [int] IDENTITY(1,1) NOT NULL,
	[AlternativeCardID] [varchar](10) NOT NULL,
	[DispositionSK] [int] NULL,
	[CardType] [varchar](25) NULL,
	[IssuedDate] [date] NULL,
	[InsertDate] [datetime] NULL,
	[ModifiedDate] [datetime] NULL,
 CONSTRAINT [PK_DimCard] PRIMARY KEY CLUSTERED
(
	[CardSK] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF,
ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON) ON [PRIMARY]
) ON [PRIMARY]



-- Create DimClient Table --

CREATE TABLE [dbo].[DimClient](
	[ClientSK] [int] IDENTITY(1,1) NOT NULL,
	[AlternativeClientID] [varchar](10) NOT NULL,
	[FirstName] [varchar](30) NULL,
	[LastName] [varchar](30) NULL,
	[DistrictSK] [int] NULL,
	[Gender] [varchar](10) NULL,
	[DateOfBirth] [date] NULL,
	[Age] [int] NULL,
	[Phone] [varchar](20) NULL,
	[Email] [varchar](60) NULL,
	[Address_1] [varchar](60) NULL,
	[Address_2] [varchar](60) NULL,
	[Zipcode] [int] NULL,
	[InsertDate] [datetime] NULL,
	[ModifiedDate] [datetime] NULL,
	[StartDate] [datetime] NULL,
	[EndDate] [datetime] NULL,
 CONSTRAINT [PK_DimClient] PRIMARY KEY CLUSTERED
(
	[ClientSK] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF,
ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON) ON [PRIMARY]
) ON [PRIMARY]



-- Create DimDistrict Table --

CREATE TABLE [dbo].[DimDistrict](
	[DistrictSK] [int] IDENTITY(1,1) NOT NULL,
	[AlternativeDistrictID] [int] NOT NULL,
	[City] [varchar](50) NULL,
	[State] [varchar](50) NULL,
	[Region] [varchar](50) NULL,
	[InsertDate] [datetime] NULL,
	[ModifiedDate] [datetime] NULL,
 CONSTRAINT [PK_DimDistrict] PRIMARY KEY CLUSTERED
(
	[DistrictSK] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF,
ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON) ON [PRIMARY]
) ON [PRIMARY]



-- Create DimDisposition Table --

CREATE TABLE [dbo].[DimDisposition](
	[DispositionSK] [int] IDENTITY(1,1) NOT NULL,
	[AlternativeDispositionID] [varchar](10) NOT NULL,
	[AccountSK] [int] NULL,
	[ClientSK] [int] NULL,
	[DispositionType] [varchar](25) NULL,
	[InsertDate] [datetime] NULL,
	[ModifiedDate] [datetime] NULL,
 CONSTRAINT [PK_DimDisposition] PRIMARY KEY CLUSTERED
(
	[DispositionSK] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF,
ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON) ON [PRIMARY]
) ON [PRIMARY]
```

```
-- Create DimLoan Table --

CREATE TABLE [dbo].[DimLoan](
	[LoanSK] [int] IDENTITY(1,1) NOT NULL,
	[AlternativeLoanID] [varchar](10) NOT NULL,
	[AccountSK] [int] NULL,
	[DistrictSK] [int] NULL,
	[Amount] [numeric](18, 2) NULL,
	[Duration] [int] NULL,
	[Payments] [numeric](18, 2) NULL,
	[Status] [varchar](5) NULL,
	[Loan_date] [date] NULL,
	[Purpose] [varchar](50) NULL,
	[InsertDate] [datetime] NULL,
	[ModifiedDate] [datetime] NULL,
 CONSTRAINT [PK_DimLoan] PRIMARY KEY CLUSTERED
(
	[LoanSK] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF,
ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON) ON [PRIMARY]
) ON [PRIMARY]
```

```
-- Create DimPermanentOrder Table --

CREATE TABLE [dbo].[DimPermanentOrder](
	[OrderSK] [int] IDENTITY(1,1) NOT NULL,
	[AlternativeOrderID] [int] NOT NULL,
	[AccountSK] [int] NULL,
	[Bank_to] [varchar](10) NULL,
	[Account_to] [int] NULL,
	[Amount] [numeric](18, 2) NULL,
	[OrderType] [varchar](100) NULL,
	[InsertDate] [datetime] NULL,
	[ModifiedDate] [datetime] NULL,
 CONSTRAINT [PK_DimPermanentOrder] PRIMARY KEY CLUSTERED
(
	[OrderSK] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, IGNORE_DUP_KEY = OFF,
ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON) ON [PRIMARY]
) ON [PRIMARY]
```

```sql
-- Create FactTransaction Table --

CREATE TABLE [dbo].[FactTransaction](
	[TransactionID] [varchar](10) NOT NULL,
	[AccounSK] [int] NULL,
	[ClientSK] [int] NULL,
	[LoanSK] [int] NULL,
	[OrderSK] [int] NULL,
	[DispositionSK] [int] NULL,
	[DateSK] [int] NULL,
	[Type] [varchar](25) NULL,
	[Operation] [varchar](50) NULL,
	[Amount] [decimal](18, 2) NULL,
	[Balance] [decimal](18, 2) NULL,
	[InsertDate] [datetime] NULL,
	[ModifiedDate] [datetime] NULL
	) ON [PRIMARY]
```

7.2. Stored Procedure SQL Queries

```
-- Stored Procedure for DimAccount --

CREATE PROCEDURE [dbo].[UpdateDimAccount]
@AccountID varchar(10),
@DistrictSK int,
@Freq varchar(50),
@startDate date
AS
BEGIN
if not exists (select AccountSK
from dbo.DimAccount
where AlternativeAccountID = @AccountID)
BEGIN
insert into dbo.DimAccount
(AlternativeAccountID, DistrictSK, Frequency, StartedDate, InsertDate,
ModifiedDate)
values
(@AccountID, @DistrictSK, @Freq, @startDate, GETDATE(), GETDATE())
END;
if exists (select AccountSK
from dbo.DimAccount
where AlternativeAccountID = @AccountID)
BEGIN
update dbo.DimAccount
set DistrictSK = @DistrictSK,
Frequency = @Freq,
StartedDate = @startDate,
ModifiedDate = GETDATE()
where AlternativeAccountID = @AccountID
END;
END;

-- Stored Procedure for DimCard --

CREATE PROCEDURE [dbo].[UpdateDimCard]
@CardID varchar(10),
@DispositionKey int,
@Type varchar(25),
@IssuedDate date
AS
BEGIN
if not exists (select CardSK
from dbo.DimCard
where AlternativeCardID = @CardID)
BEGIN
insert into dbo.DimCard
(AlternativeCardID, DispositionSK, CardType, IssuedDate, InsertDate,
ModifiedDate)
values
(@CardID, @DispositionKey, @Type, @IssuedDate, GETDATE(), GETDATE())
END;
```

```
if exists (select CardSK
from dbo.DimCard
where AlternativeCardID = @CardID)
BEGIN
update dbo.DimCard
set DispositionSK = @DispositionKey,
CardType = @Type,
IssuedDate = @IssuedDate,
ModifiedDate = GETDATE()
where AlternativeCardID = @CardID
END;
END;
```

```
-- Stored Procedure for DimDisposition --

CREATE PROCEDURE [dbo].[UpdateDimDisposition]
@DispositionID varchar(10),
@AccountKey int,
@ClientKey int,
@Type varchar(25)
AS
BEGIN
if not exists (select DispositionSK
from dbo.DimDisposition
where AlternativeDispositionID = @DispositionID)
BEGIN
insert into dbo.DimDisposition
(AlternativeDispositionID, AccountSK, ClientSK, DispositionType, InsertDate,
ModifiedDate)
values
(@DispositionID, @AccountKey, @ClientKey, @Type, GETDATE(), GETDATE())
END;
if exists (select DispositionSK
from dbo.DimDisposition
where AlternativeDispositionID = @DispositionID)
BEGIN
update dbo.DimDisposition
set AccountSK = @AccountKey,
ClientSK = @ClientKey,
DispositionType = @Type,
ModifiedDate = GETDATE()
where AlternativeDispositionID = @DispositionID
END;
END;
```

```
-- Stored Procedure for DimDistrict --

CREATE PROCEDURE [dbo].[UpdateDimDistrict]
@DistrictID int,
@City varchar(50),
@State varchar(50),
@Region varchar(50)
AS
BEGIN
```

```
if not exists (select DistrictSK
from dbo.DimDistrict
where AlternativeDistrictID = @DistrictID)
BEGIN
insert into dbo.DimDistrict
(AlternativeDistrictID, City, State, Region, InsertDate, ModifiedDate)
values
(@DistrictID, @City, @State, @Region, GETDATE(), GETDATE())
END;
if exists (select DistrictSK
from dbo.DimDistrict
where AlternativeDistrictID = @DistrictID)
BEGIN
update dbo.DimDistrict
set City = @City,
State = @State,
Region = @Region,
ModifiedDate = GETDATE()
where AlternativeDistrictID = @DistrictID
END;
END;


-- Stored Procedure for DimLoan --

Create PROCEDURE [dbo].[UpdateDimLoan]
@LoanID varchar(10),
@AccountSK int,
@DistrictSk int,
@Amount numeric(18, 2),
@Duration int,
@Payments numeric(18, 2),
@Status varchar(5),
@LoanDate date,
@Purpose varchar(50)
AS
BEGIN
if not exists (select LoanSK
from dbo.DimLoan
where AlternativeLoanID = @LoanID)
BEGIN
insert into dbo.DimLoan
(AlternativeLoanID, AccountSK, DistrictSK, Amount, Duration, Payments, Status,
Loan_date,
 Purpose, InsertDate, ModifiedDate)
values
(@LoanID, @AccountSK, @DistrictSk, @Amount, @Duration, @Payments, @Status,
@LoanDate,
@Purpose, GETDATE(), GETDATE())
END;
if exists (select LoanSK
from dbo.DimLoan
where AlternativeLoanID = @LoanID)
BEGIN
update dbo.DimLoan
```

```
set AccountSK = @AccountSK,
DistrictSK = @DistrictSk,
Amount = @Amount,
Duration = @Duration,
Payments = @Payments,
Status = @Status,
Loan_date = @LoanDate,
Purpose = @Purpose,
ModifiedDate = GETDATE()
where AlternativeLoanID = @LoanID
END;
END;
```

-- Stored Procedure for DimPermanentOrder --

```
CREATE PROCEDURE [dbo].[UpdateDimPermanentOrder]
@OrderID int,
@AccountSK int,
@Bankto varchar(10),
@AccountTo int,
@Amount numeric(18, 0),
@ordertype varchar(100)
AS
BEGIN
if not exists (select OrderSK
from dbo.DimPermanentOrder
where AlternativeOrderID = @OrderID)
BEGIN
insert into dbo.DimPermanentOrder
(AlternativeOrderID, AccountSK, Bank_to, Account_to, Amount, OrderType,
InsertDate, ModifiedDate)
values
(@OrderID, @AccountSK, @Bankto, @AccountTo, @Amount, @ordertype, GETDATE(),
GETDATE())
END;
if exists (select OrderSK
from dbo.DimPermanentOrder
where AlternativeOrderID = @OrderID)
BEGIN
update dbo.DimPermanentOrder
set AccountSK = @AccountSK,
Bank_to = @Bankto,
Account_to = @AccountTo,
Amount = @Amount,
OrderType = @ordertype,
ModifiedDate = GETDATE()
where AlternativeOrderID = @OrderID
END;
END;
```