Machine Learning (Framework Mode) User Manual

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1 Preface

1.1 Introduction

This manual is designed to assist you in getting acquainted with the Oracle FLEXCUBE Machine Learning framework.

It has detailed stepwise instructions to help you build Oracle FLEXCUBE Machine Learning models and process their execution.

The manual also outlines how to access and interpret the model outcomes for augmented decision making.

1.2 Audience

This manual is intended for the following Users/User Roles:

Role	Function
Branch Managers	Overall Branch Perspective
Account Managers/Relationship Managers	Customer Relationship Management
Head Office Managers	Overall Bank Perspective
FLEXCUBE Admin/IT support	Application Administration and Support

1.3 Organization

This manual is organized as per the following chapters:

Chapter	Description
Overview of Machine Learning	It introduces the Machine Learning context and specifically the Oracle FLEXCUBE framework.
Model Building Routine	This chapter contains instructions on how to build Machine Learning Models using historical Oracle FLEXCUBE data.
Model Execution Routine	This chapter explains how to apply Machine Learning Models on Oracle FLEXCUBE data.
Enterprise Dashboard	This section helps you interpret information collated across the enterprise and present a consolidated perspective of the bank.
Branch Dashboard	This screen helps you interpret information from the current branch perspective.
Customer Query Board	This allows you to query customers across the bank based on attrition Risk profile, branch code and/or segment.

2 Overview of Machine Learning

2.1 Introduction

Machine Learning is heavily dependent on historical data to build models and use the models to predict outcomes for better decision making.

The following points encompasses contextual information to help you get familiarized with the subject:

1. Machine learning model building is dependent on historical data, spread across dates.
2. Model building will take time. It may range from couple of minutes to hours, sometime days, depending on the algorithm complexity.
3. Model must be built for each bank. It cannot be pre-shipped not it can be re-used across banks.
4. Model is ONLY as good as the data used to build it.
5. Built Model are valid only for the data used to build the model.
6. The pre-shipped ORE code is designed to work with the data model provided as part of the release.
7. The modelling code may need to be modified under the following circumstances.
    a. The underlying data limits model performance and mandates modifying the pre-shipped ORE code.
    b. Data Model is altered, on business demand.

2.2 Machine Learning in Oracle FLEXCUBE

The machine learning framework is embedded within Oracle FLEXCUBE. It is built using Oracle R Enterprise, which is separately licensed.

The business cases are limited to retail customers.

2.3 Pre-requisites

The following Pre-requisites are mandatory for the Machine Learning Framework:

Environmental

1. *Separate instance of Machine Learning Server.*



Note: ORE database MUST be a separate instance from Oracle FLEXCUBE Instance. This is to ensure that the machine learning algorithmic processing workload is not on the critical path of banking operations and consume critical FLEXCUBE server memory.

2. *Machine Learning Database is Oracle 18c.*
3. *Oracle R Enterprise is installed in the Machine Learning Server.*

Historical Data



Date wise transaction history in Oracle FLEXCUBE is mandatorily required for building machine learning models.
Consulting/Solution team to consider extracting legacy transaction history as part of migration strategy.

Oracle FLEXCUBE Data Replication



Data replication from FLEXCUBE to the Machine learning server is outside the purview of this manual.

Any data replication software could be deployed to replicate Oracle FLEXCUBE data to the Machine Learning database instance.

It is left to the bank/solution team to decide on the data Replication Software including the mode of replication and frequency of replication.

Refer to the Installation Guide for completing the installation, prior to initiating the model building routine.

3 Model Building Routine

Refer to the Pre-requisites prior to proceeding with the next section.

This is the first step to be executed.

3.1 Contextual Information

This is the first time the Machine Learning is being setup for Oracle FLEXCUBE.

As part of this process, historical FLEXCUBE data will be referenced, and requisite data transformation routine will be called. Customer churn model is the only one that will be built. The customer lifetime value and segmentation do not have a persistent model object and gets executed runtime.

3.2 Model Building

User(s)

It is suggested that only the FLEXCUBE user with admin rights should have access to the model building screens.

Launch '**Model Execution and Control**' screen from the menu.

Machine Learning Retail -> Model Administration -> Model Execution and Control

Select '**Model Build**' radio button.

DATA FIELDS	REMARKS
Period Start Date	Models get built on historical data. This is the historical period start date to be considered.
Period End Date	Models get built on historical data. This is the historical period end date to be considered.
Churn Date	This field represents the future prediction window. For example, if we want to have a prediction window of 3 months, this would be Period End Date + 3 months.
Silent Period to consider for churn identification	While closed customers are considered as churned, for open customers having sufficiently long silent period of no transaction can also be considered as churned. This is the field that determines the number of silent days, to be considered for open customers to be tagged as churned.

Suggestions:

- PERIOD START DATE and PERIOD END DATE to cover a span of 12 Months back period.
- CHURN DATE to be at least 3 months into the future from the PERIOD END DATE.

Process '**Model Build**' routine.

Click '**Process**' button to trigger model building.

Note:

- Model building time may extend from several minutes to few hours.
- Models once built can be re-used each time the data is refreshed.
- Models are usually re-built, if the underlying data has undergone drastic change in pattern and triggers a decrease in model performance.

4 Model Execution Routine

Please refer to the pre-requisites prior to proceeding with the next section.

This is the second step to be executed. It is assumed that model building routine mentioned in the previous section is already processed.

4.1 Contextual Information

As part of this process, data will be refreshed as of the current date. The customer churn model that has been built in the previous step will be loaded and executed. As part of this routine the customer lifetime value and segmentation models will get built and executed runtime.

4.2 Model Execution

User(s)

It is suggested that only the FLEXCUBE user with admin rights should have access to the model execution screens.

Launch '**Model Execution and Control**' screen from the menu.

Machine Learning Retail -> Model Administration -> Model Execution and Control

Select '**Model Execute**' radio button.

DATA FIELDS	REMARKS
Period Start Date	Will get defaulted to 12 months prior to Period End date. User can modify.
Period End Date	Will get defaulted to maximum of today from sttm dates. Not allowed to modify.
Churn Date	Will get defaulted to Period End date. Not allowed to modify.
Silent Period to consider for churn identification	Will get defaulted to 180 days. Not allowed to modify.

Suggestions:

- Period Start Date and Period End Date to cover a span of 12 Months.

Process 'Model Execute' routine.

Click 'Process' button to trigger model execution.

Periodic Model Execution

- Model execution frequency will be decided by business.

Note:

- Model execution time may extend from several minutes to few hours.
- Built Models are re-used each time the data is refreshed.

5 Enterprise Dashboard

This screen displays model outcomes collated across the enterprise to present a consolidated perspective of the bank.

Only customers with at least one transaction are being displayed.

The screen can be accessed at -

Machine Learning Retail -> Customer -> Enterprise Dashboard

5.1 Enterprise Customer Attrition

This screen displays the risk profile of the entire customer base of the bank.

- Top 5 and bottom 5 branches can be queried based on attrition risk profile.
- Default query is HIGH Risk
- Select single or a combination of Risk categories and click on the button 'Churn Analysis' to get the top 5 and bottom 5 for the queried combination of risk categories.

5.2 Enterprise Customer Segmentation

This screen displays the segmentation of the entire customer base of the bank and the segment details. This is a view only screen.

6 Branch Dashboard

This screen displays model outcome for the current logged-in branch.

Only customers with at least one transaction are being displayed.

The screen can be accessed at –

Machine Learning Retail -> Customer -> Branch Dashboard

6.1 Branch Customer Attrition

This screen displays the customer attrition risk profile of the current branch. It is a view only screen.

6.2 Branch Customer Segmentation

This screen displays the segmentation of the customer base of the current branch and the segment details. This is a view only screen.

7 Customer Query Board

This screen can be assessed at –

Machine Learning Retail -> Customer -> Customer Query Board

It allows user to query customers based on the following filters.

- Attrition Risk profile
- Branch code
- Customer Segment

However, Individual customer IDs can also be queried. In that case, it will display the customer's corresponding risk and segment.

Select the query combination and click on '**Analysis**'.

The default query at screen launch is,

Attrition Risk profile : HIGH
Branch code : current logged-in branch
Customer Segment : 1

The displayed information for each customer has been collated across,

- Risk Profiles

- Segment to which the customer belongs.
- Lifetime Value should the customer continue the relationship till perpetuity.
- Recommended product(s) for the customer, with decreasing order of recommendation, based on the historical purchase behavior of the segment to which the customer belongs.

Further, to assist in decision making and identify relative positioning, comparative lifetime value information is presented across the perspectives of,

Segment Lifetime Value

- Segment Minimum
- Segment Median
- Segment Maximum

Bank Lifetime Value

- Segment Minimum
- Segment Median
- Segment Maximum