DEMAND PLANNING

Umoja Demand Planning and Supply Network Planning Solution

SUMMARY

UCS Training Team

Overview

Annual Supply Chain Planning

GROSS DEMAND
Total requirements for goods and services per entity and budget year

Projected Inventory Holdings
Current Holdings + Goods in Inventory Pipeline - Forecasted Planned Consumption (from the current date till the end of FY) - Goods Return (writes off, obsolete, passed life expectancy).

NET DEMAND
Net Requirement for goods and services. Unconstrained Net Demand

- **Gross Demand reflects:**

  - Total requirements for goods and services

  - Alignment with mandate activities

- **Net Demand reflects:**

  - Net requirements for goods and services

  - Unconstrained

Source Planning

Source = Modalities to prioritize and fulfill demand according to available sourcing options

Source is done from the following sourcing options

Commercial:

System Contracts	Turn Key Contract	Existing Contracts	New Procurements

Non-Commercial:

LOA	MOU, LTA	LTA

In Sourcing:

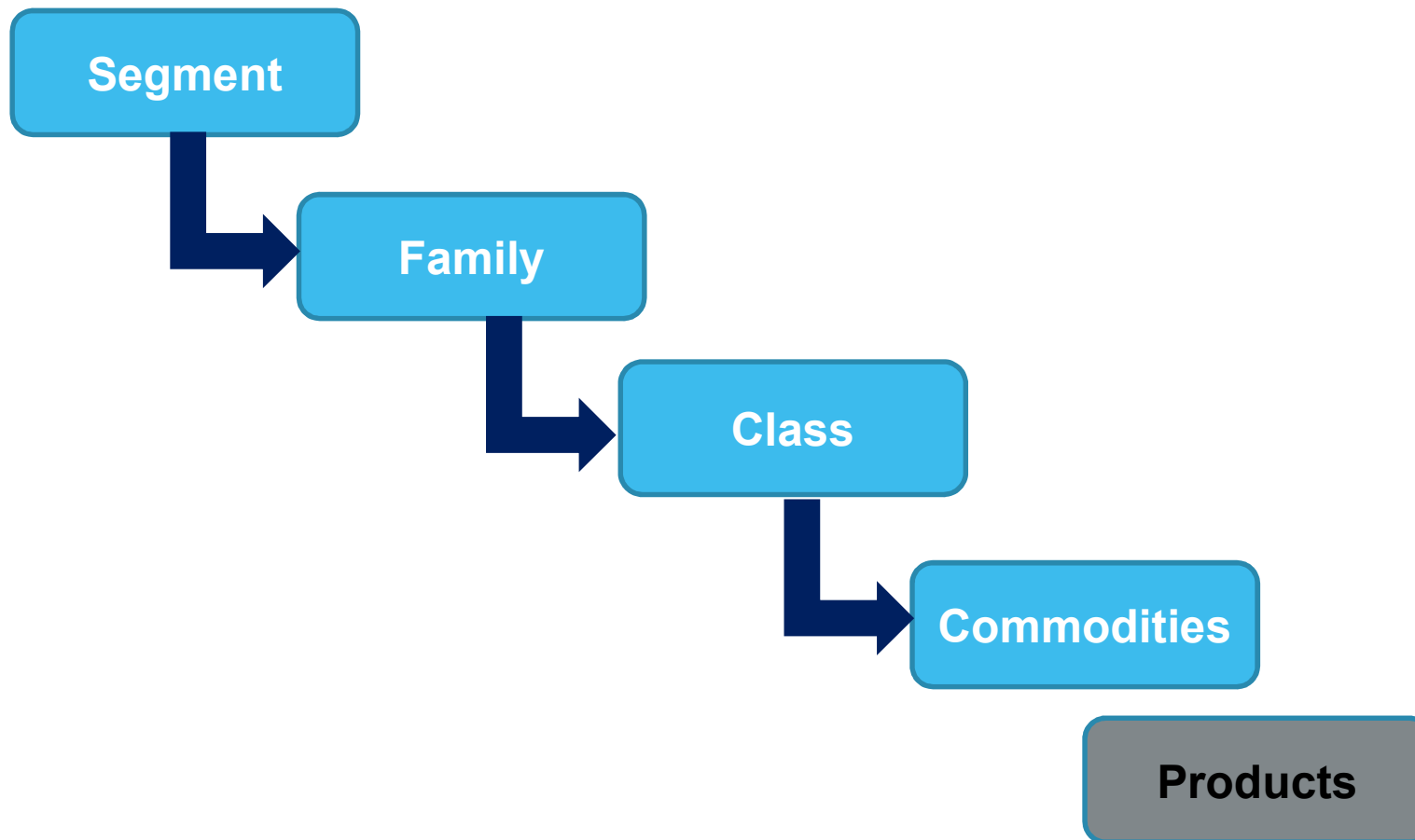| SDS	Surplus	UN reserve

IBP Meeting

Definition:

- The IBP meeting is a decision- making forum where stakeholders from the Demand (often Service Delivery Units) and Supply Chain Management Pillar and Procurement are convening
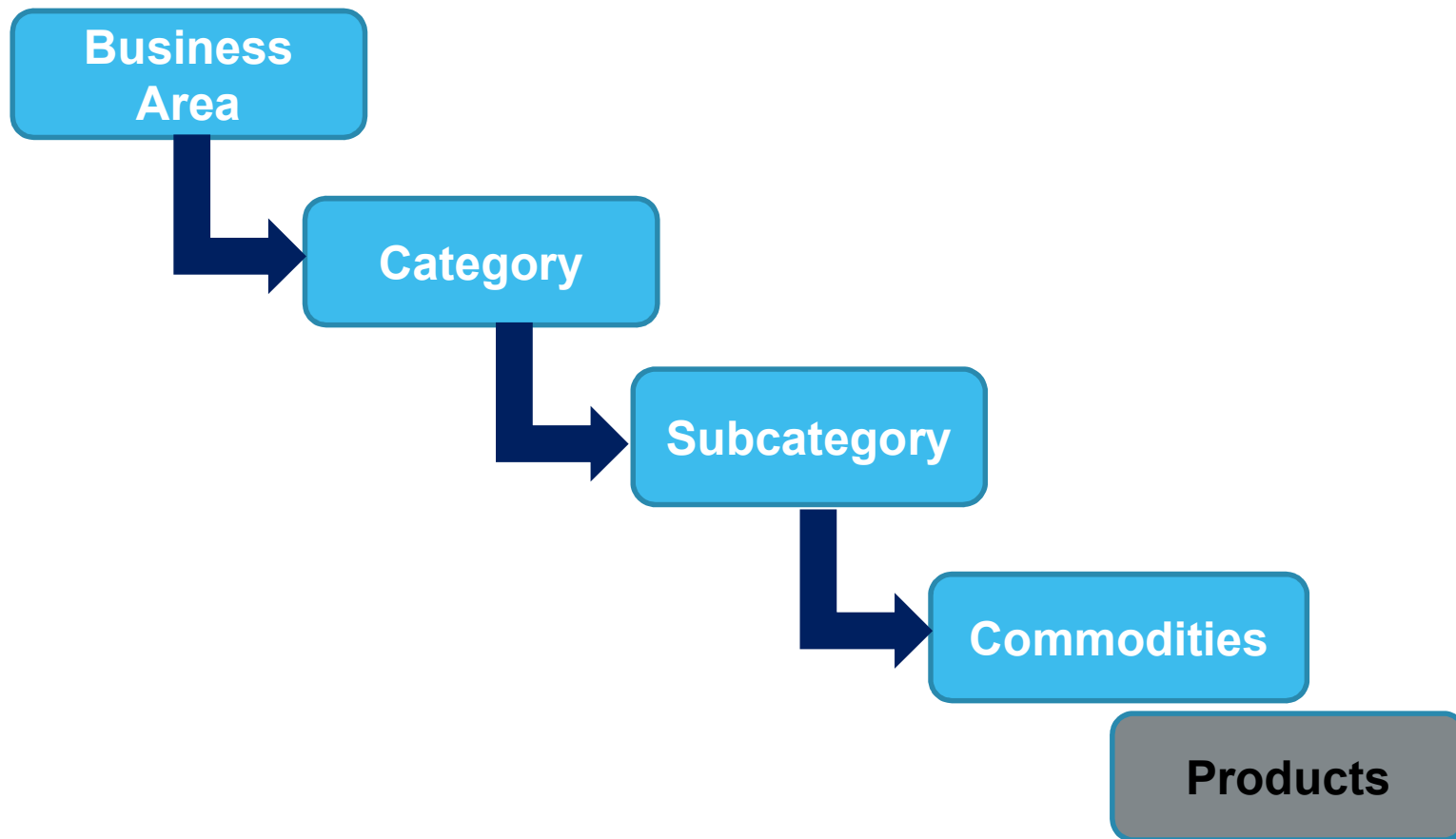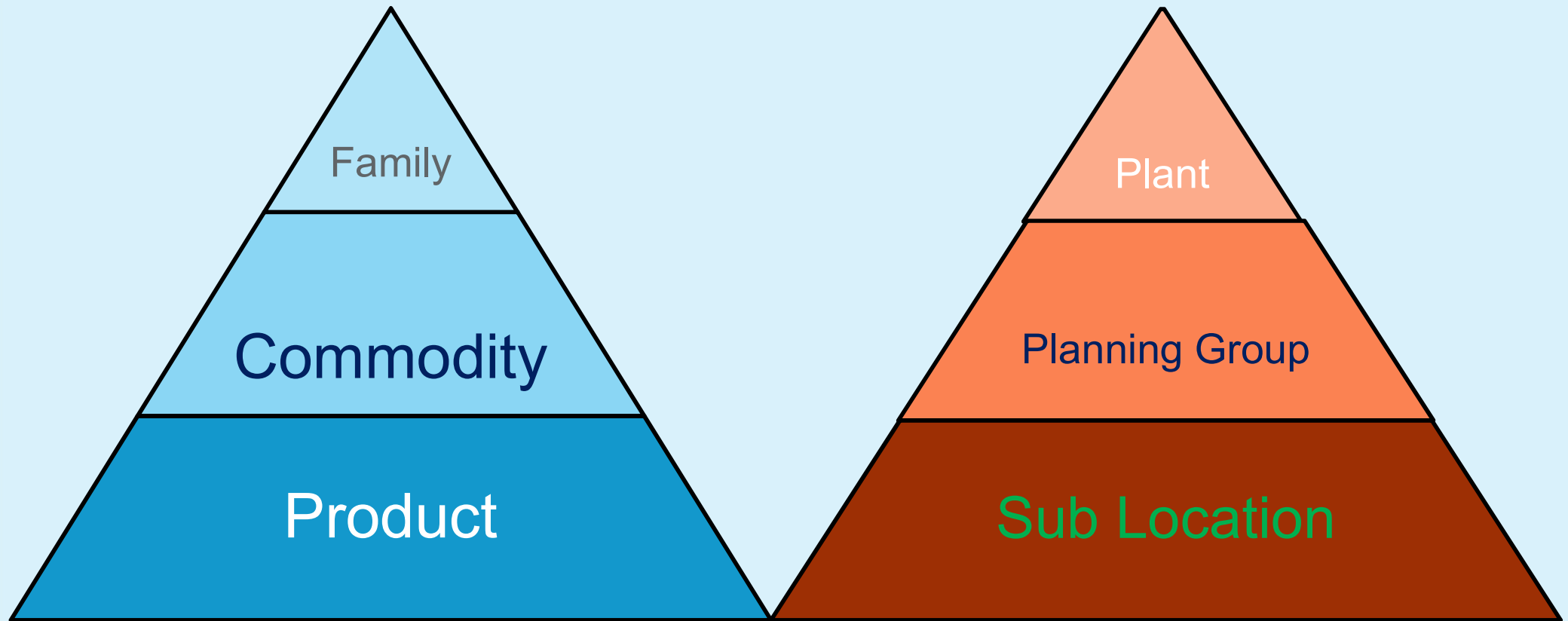- The IBP meetings take place at local, global and HQ level.

Goals:

- To review and agree on a consensual Net Demand and ensure alignment between forecast and reality.

Demand Planning is done at the fourth Levels Hierarchy of UN Standard Products and Services Code
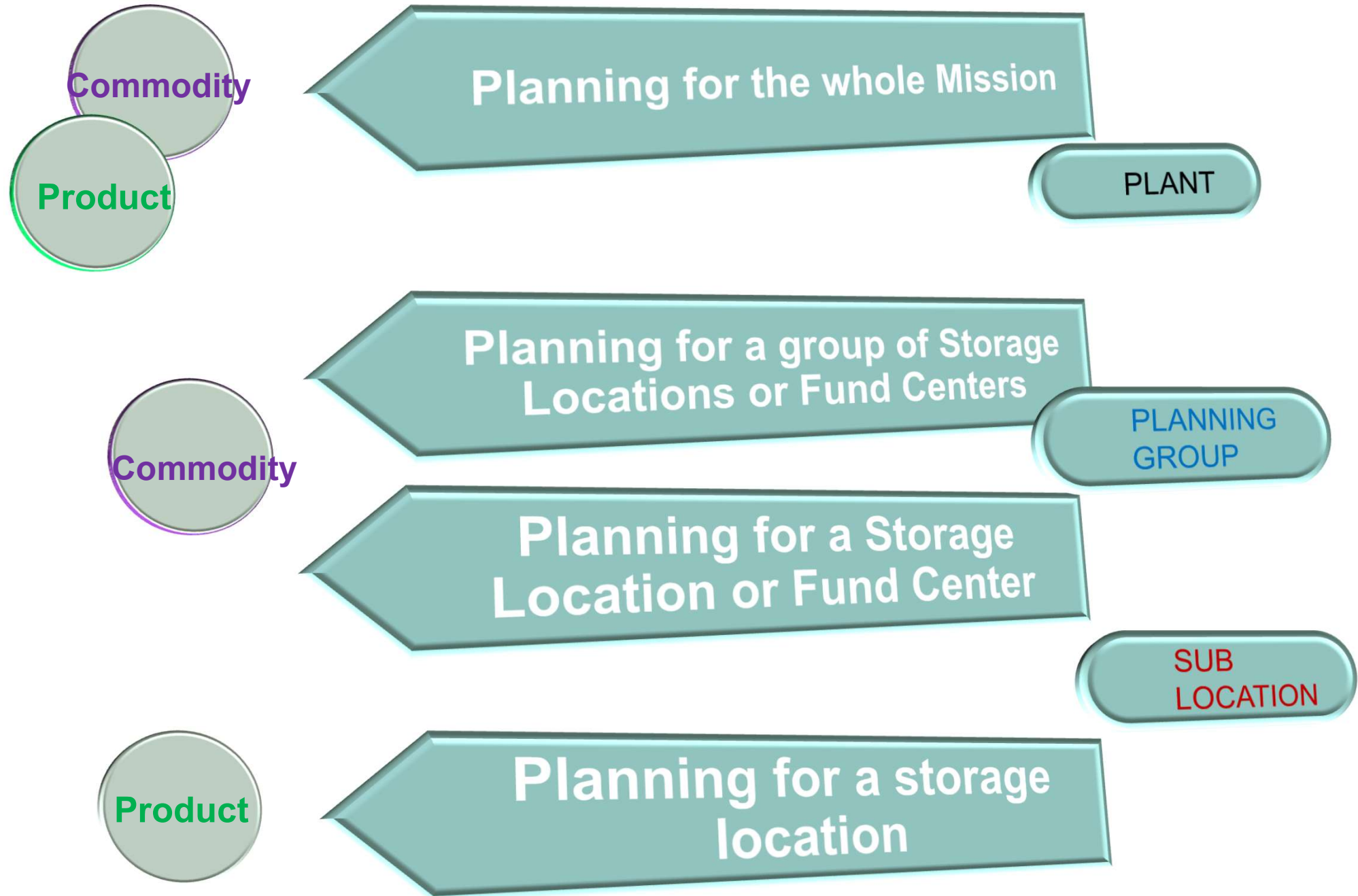
Demand Planning can be done at category, subcategory or commodities level
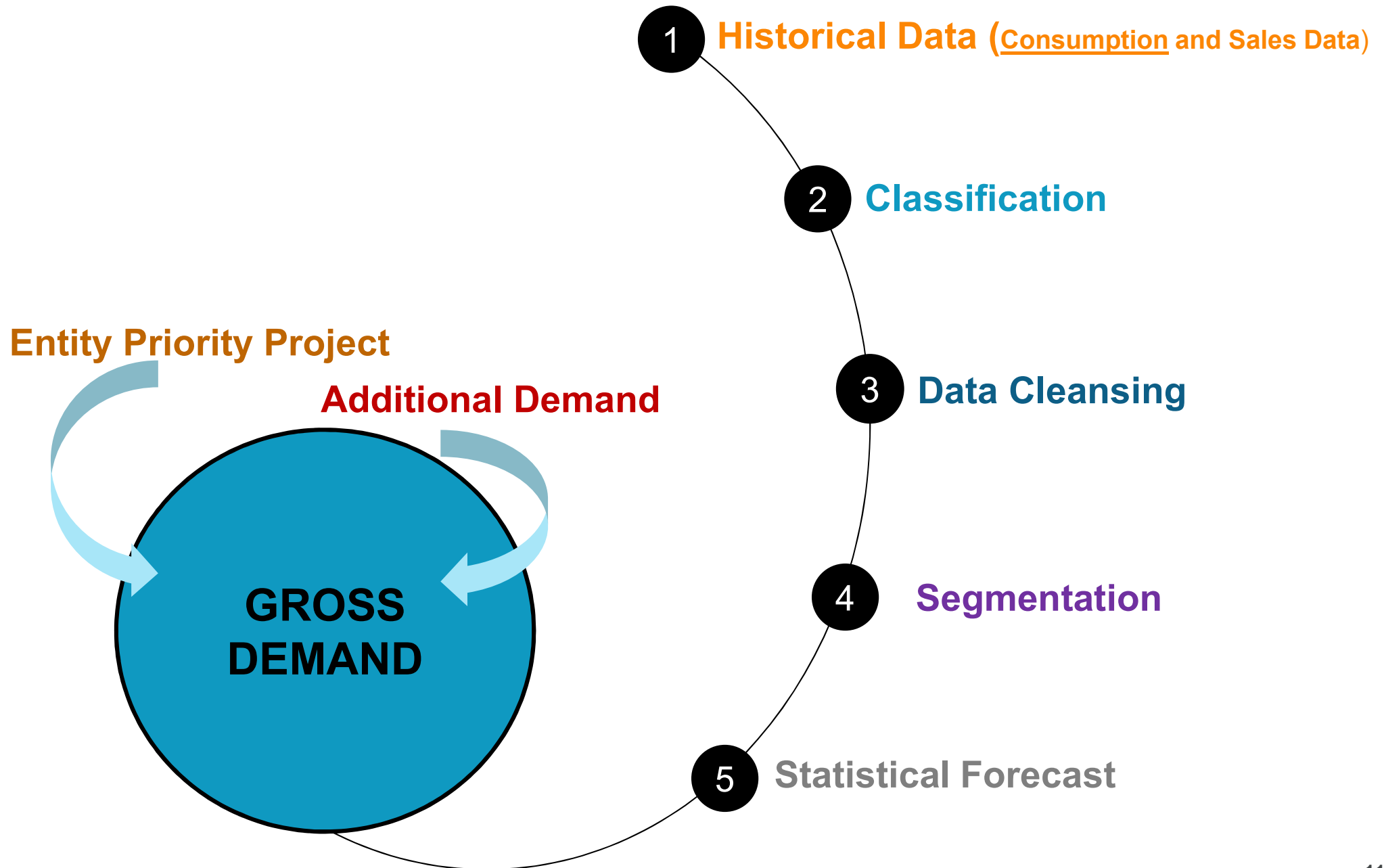
Commodity

Product

Planning for the whole Mission

PLANT

Commodity

Planning for a group of Storage Locations or Fund Centers

PLANNING GROUP

Planning for a Storage Location or Fund Center

SUB LOCATION

Product

Planning for a storage location

DPSNP Solution

1 **Historical Data (**_Consumption_ **and Sales Data**)

2 **Classification**

Entity Priority Project

Additional Demand

3 **Data Cleansing**

GROSS DEMAND

4 **Segmentation**

5 **Statistical Forecast**

DEPARTMENT OF
OPERATIONAL SUPPORT

Input

Cleansed History

5.Statistical Forecast

Output

Final Statistical Forecast

4.Segmentation
*Done by the system

Entity Priority Project Demand

Gross Demand

Equipment Demand

Additional Demand

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GROSS DEMAND

Final Statistical Forecast

Additional Demand
- ❖ Equipment
- ❖ Other products/services

Entity Priority Project Demand

Historical Data

1. Historical Data

From Umoja Production

Consumption History of each Material and Service

Consumption Data Adjustment (if needed)
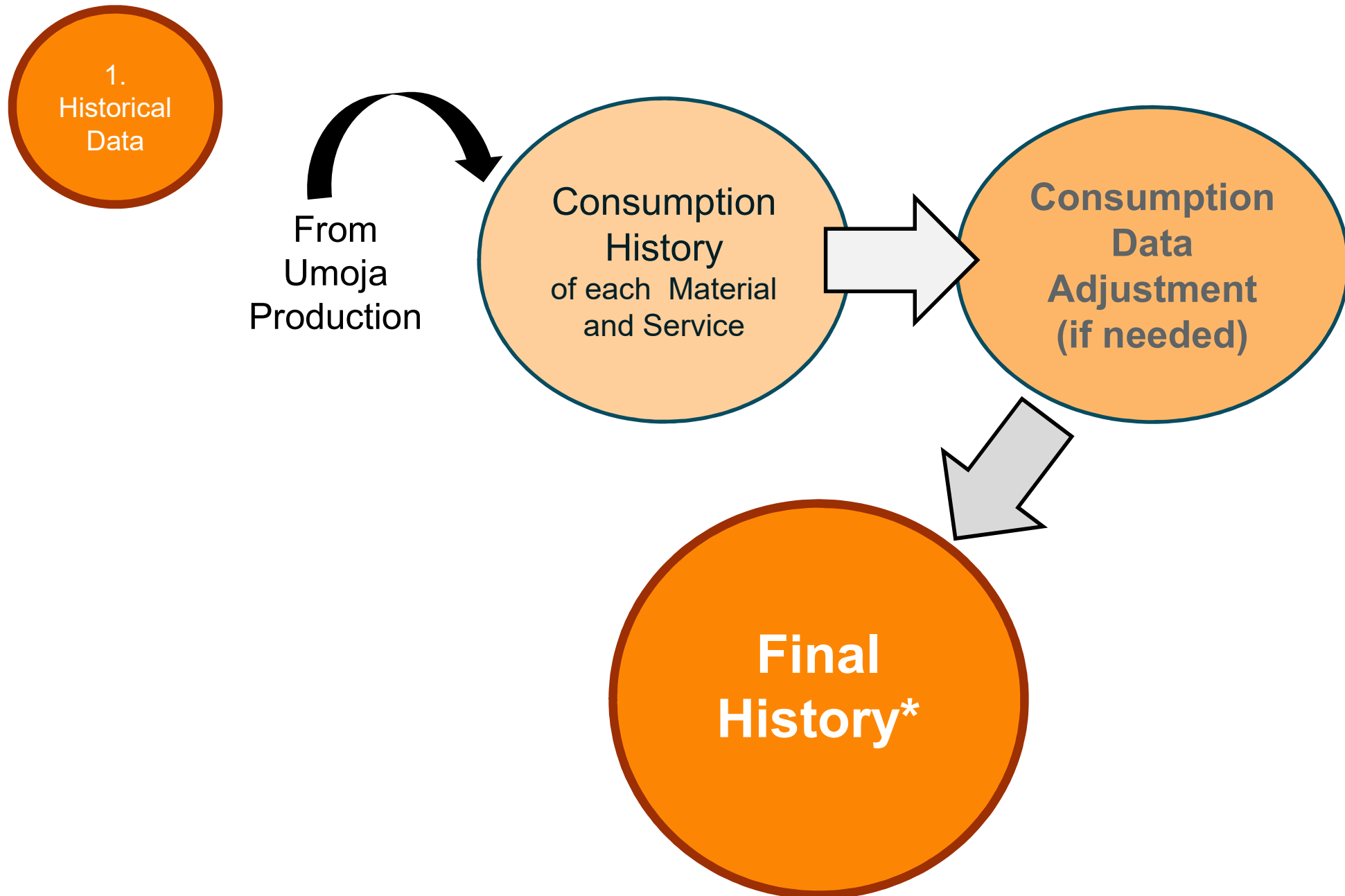
Final History*

* Final History consists of both Consumption and Sales (if any) Data

DEPARTMENT OF OPERATIONAL SUPPORT
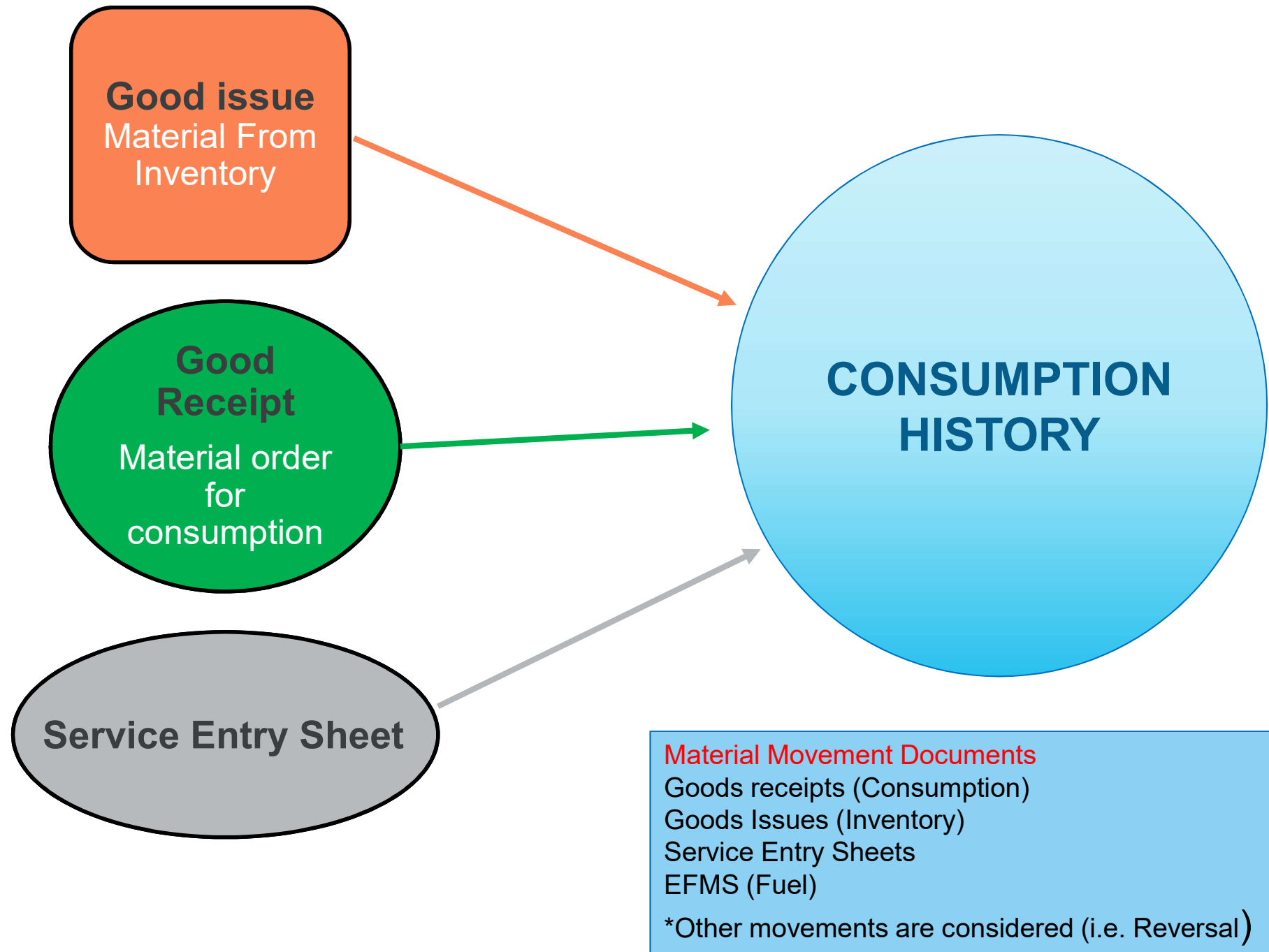
Consumption Data Adjustment (if needed)

- ❖ **Accurate Forecast** needs an accurate baseline history for the Material and Services that reflects real consumption.

  Consumption History from Umoja Production <u>might</u> <u>differ</u> from real consumption because:

Incorrect Posting Data

System Failure

Consumption History
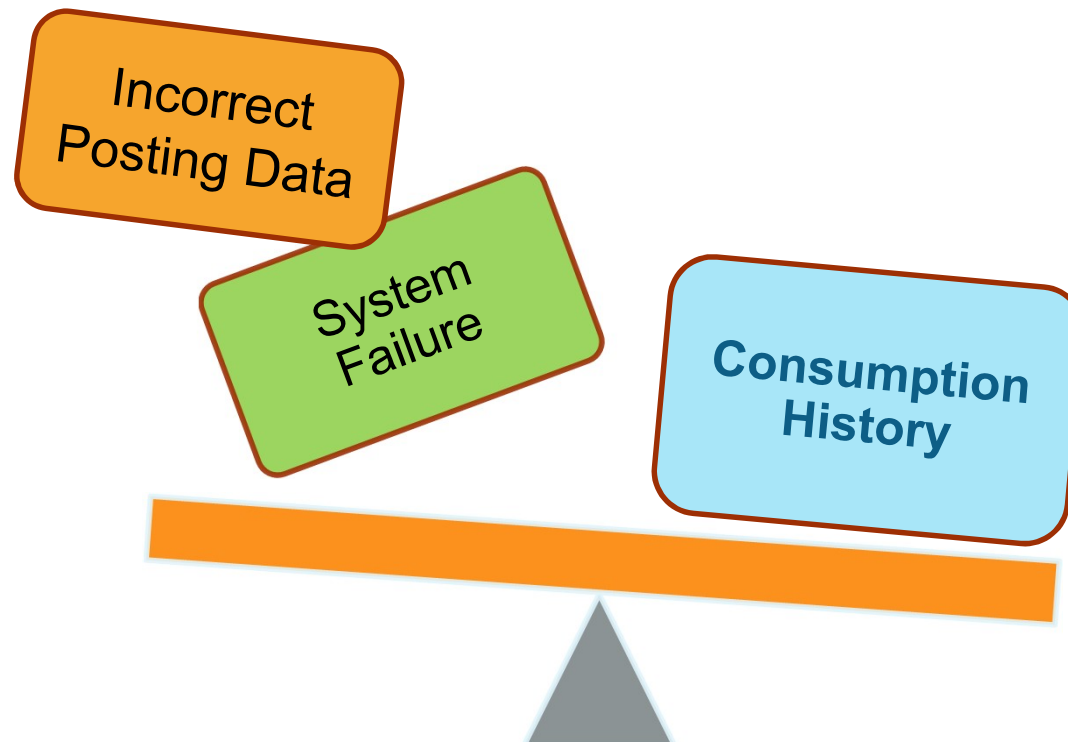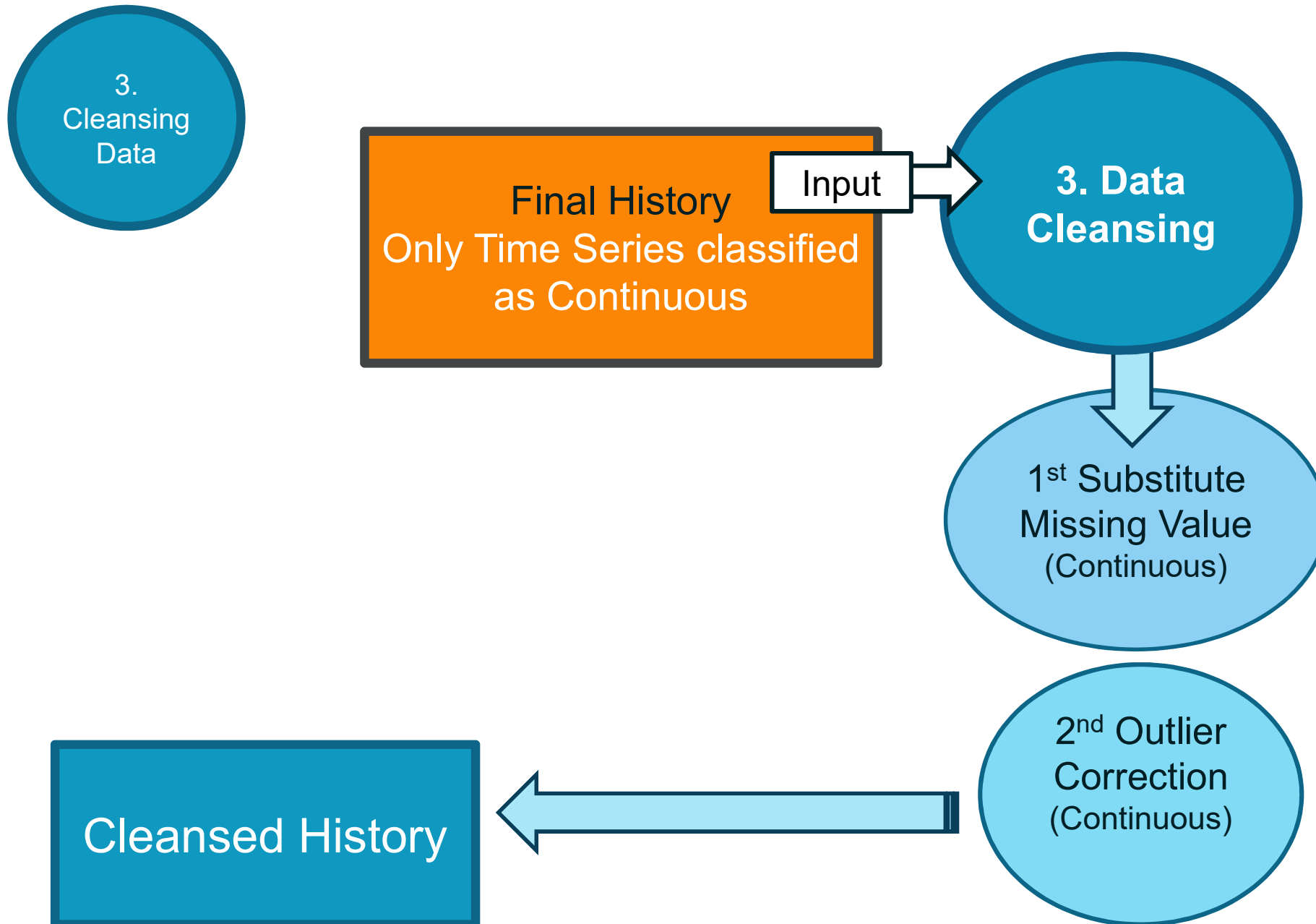
Classification and Data Cleansing

2.Classification
Done by the system

Classifies the Final Consumption History

➢The purpose of this pre-process step is carrying out a statistical analysis on the <u>Final Consumption History</u>, and classifying the time series according to various criteria such as seasonality, trend, intermittence etc.

The characteristics, called "<u>Time Series Classification</u>" are:

❖ Continuous
❖ Continuous with seasonality
❖ Continuous with seasonality and trend
❖ Continuous with trend
❑ Intermittent
❑ Intermittent with seasonality
❑ Intermittent with seasonality and trend
❑ Intermittent with trend

3. Cleansing Data

Final History
Only Time Series classified as Continuous

Input →

3. Data Cleansing

1st Substitute Missing Value
(Continuous)

2nd Outlier Correction
(Continuous)

Cleansed History

Substitute Missing Value

1st Substitute Missing Value (Continuous)

> The process of identifying gaps and replace them applies only when Data Series are:

- Continuous
- Continuous with seasonality
- Continuous with seasonality and trend
- Continuous with trend

BUT NOT WHEN DATA CLASSIFICATION IS:

Intermittent

Outlier Correction

2nd Outlier Correction

➢ The purpose of this pre-processing step is to identify outliers in the time-series and replace them.

➢ It is done **only for Continuous Data** and not for Intermittent Data.

What is an Outlier

Value, a data point of a series, that differs significantly from the other observed values of the same series.

How we identify it

We use the Variance and Standard deviation. Variance measures how far a set of numbers is spread out from its average value (mean). Standard Deviation is the mean of the variance of all numbers in the series.
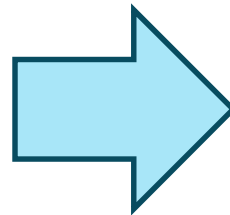
How the system acts

Replacing the outlier with a tolerance value to be able to prepare a forecast (upper/lower bounds).

Segmentation and Statistical Forecast

Product Segmentation

4.Segmentation
*Done by the system

Considering that:

❖All goods and services have their own demand particularity or characteristic.

Therefore:

❖Demand for some products *should be forecasted in priority;* several factors matter.

The goal of Product Segmentation is:

**Prioritize products based on their relative importance within a plant**

Product Segmentation: ABC

➢ The concept states that a small percentage of a group accounts for the largest fraction of the impact, value, etc.

➢ Applying the concept to inventory items we could say that 20% of the inventory items may constitute 80% of the inventory value.

➢ The ABC principle states that effort and money can be saved through applying looser controls to the low-dollar-volume class items and focus mainly on high-dollar-volume class items.

➢ Other factors to consider to segment products:

1. Demand characteristics (Consumption Volume, Volatility, etc.)

2. Supply characteristics (Cost, Availability, Location, Reliability, etc.)

3. Internal Organizational Characteristics (Strategic, Critical)

➢ XYZ analyses group of items according to the **volatility** of their demand.

➢ It focuses on how difficult is a product/service to forecast, **being X the easiest** and **Z the most difficult.**

Formula explained:

   o *First we calculate the **Average Demand** across a period.*

   o *Then we calculate the **Standard Deviation** from the **Average Demand**.*

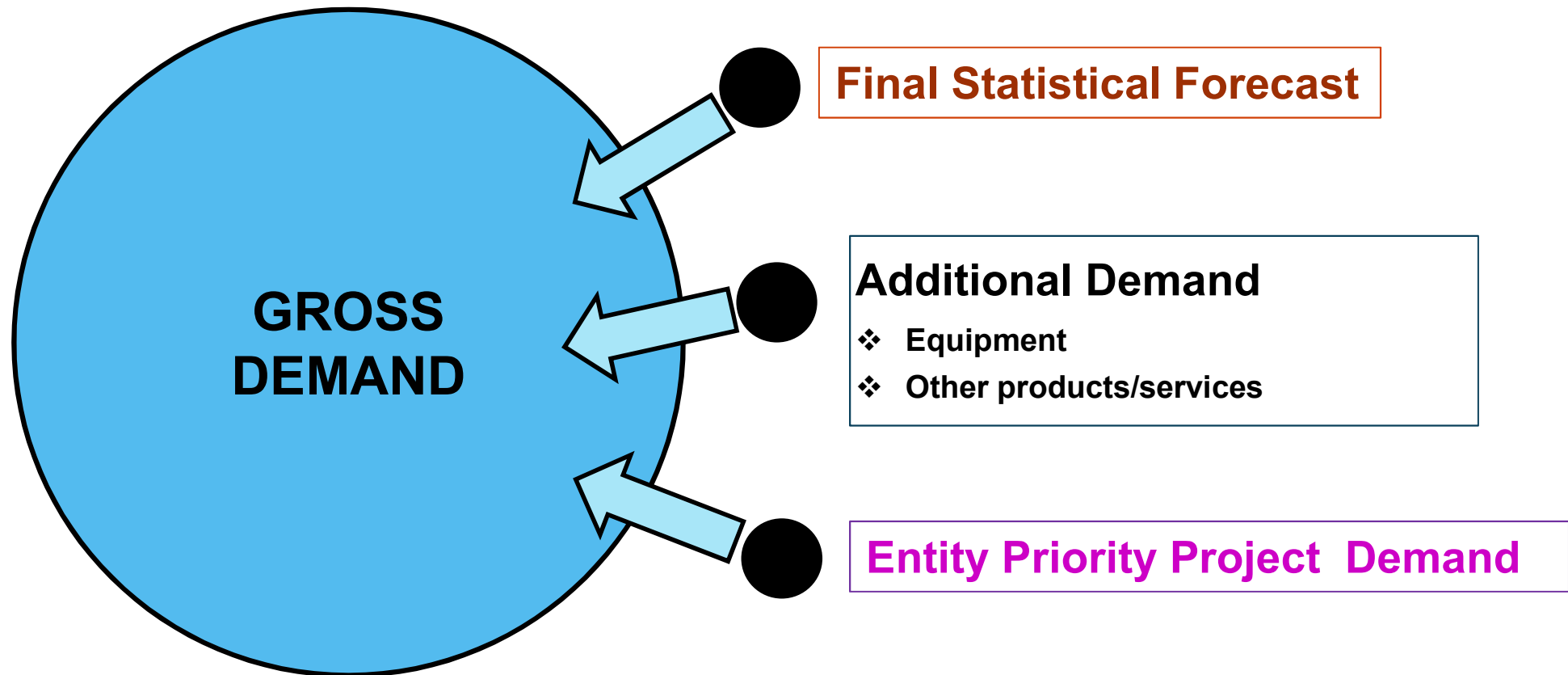   o *Lastly we calculate the **Coefficient of Variation (CV)***

$$Coefficient\ of\ Variation = \frac{Standard\ Deviation\ of\ Average\ Period\ Demand}{Average\ Period\ Demand} \times 100$$
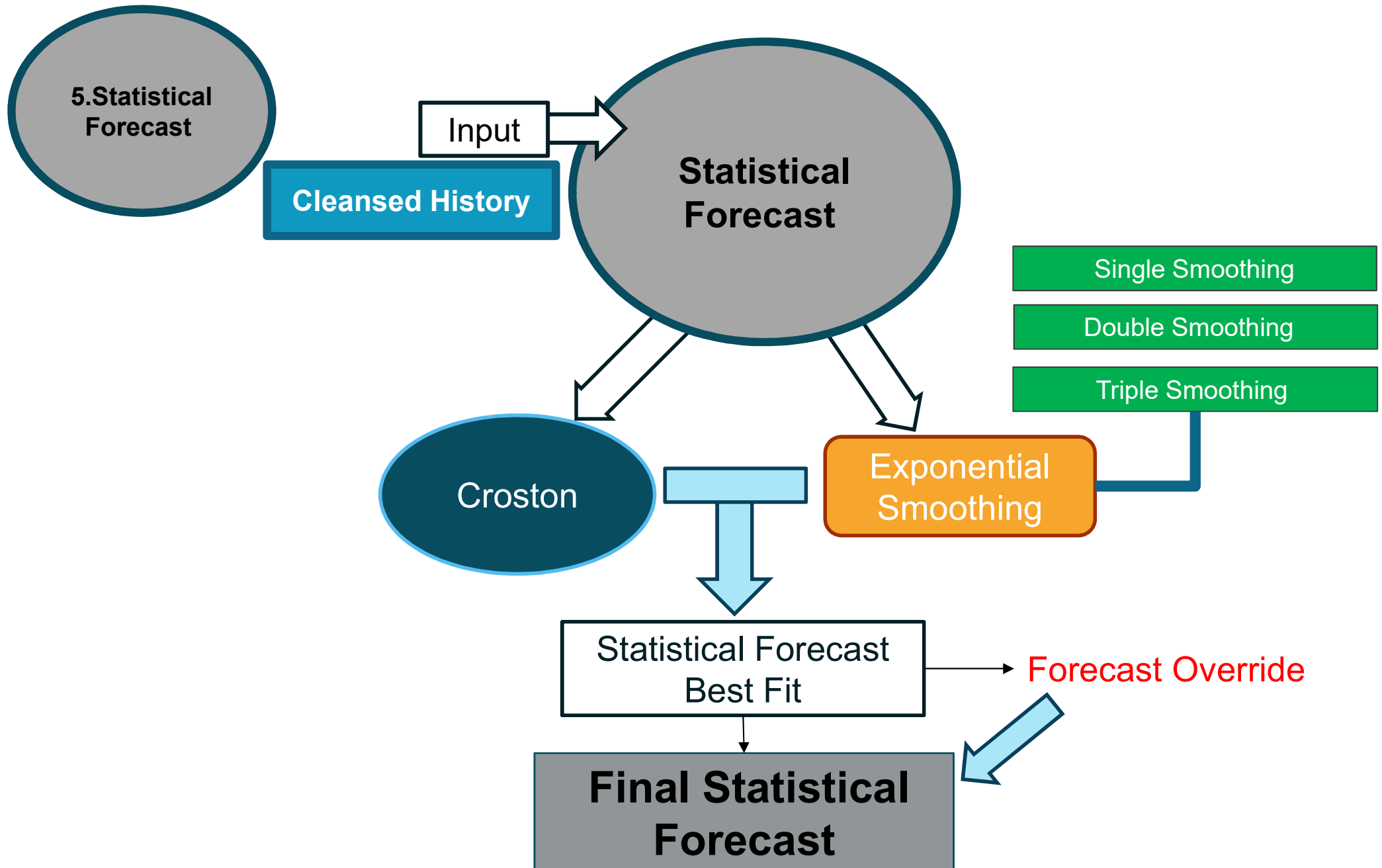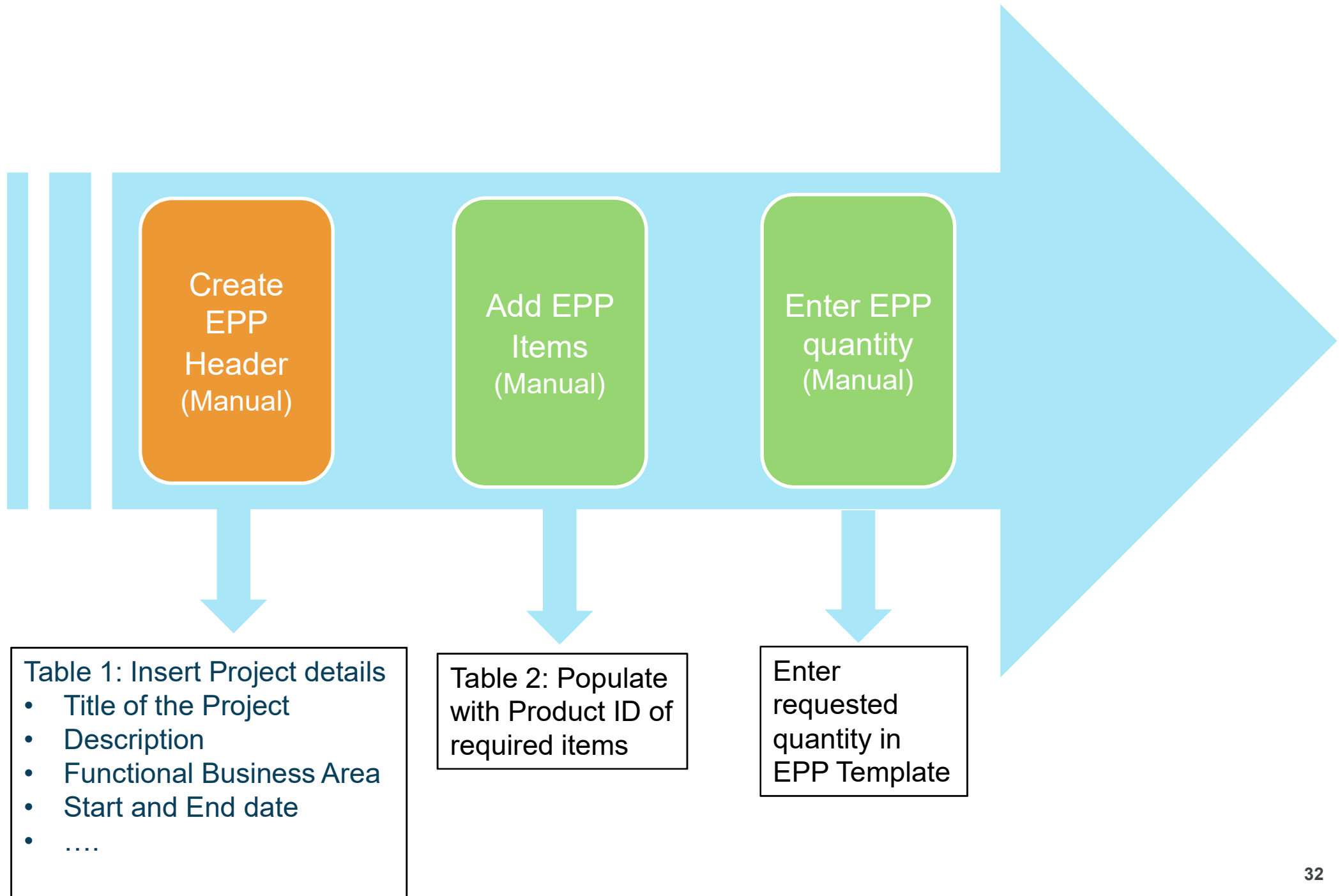
➢ At this time, the system will produce **two Forecast Values**, one as result of applying Exponential Smoothing and the other as result of applying Croston.
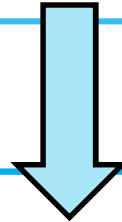
➢ The **Best Fit** will be the value between the 2 with the **lowest** Mean Absolute Percentage Error **(MAPE)**. The calculation of the Error is based on past data.

Final Statistical Forecast

GROSS DEMAND

Additional Demand
- ❖ Equipment
- ❖ Other products/services

Entity Priority Project Demand

Entity Priority Project Demand

Entity Priority Project

Create EPP Header (Manual)

Add EPP Items (Manual)

Enter EPP quantity (Manual)

Table 1: Insert Project details
- Title of the Project
- Description
- Functional Business Area
- Start and End date
- ….

Table 2: Populate with Product ID of required items

Enter requested quantity in EPP Template
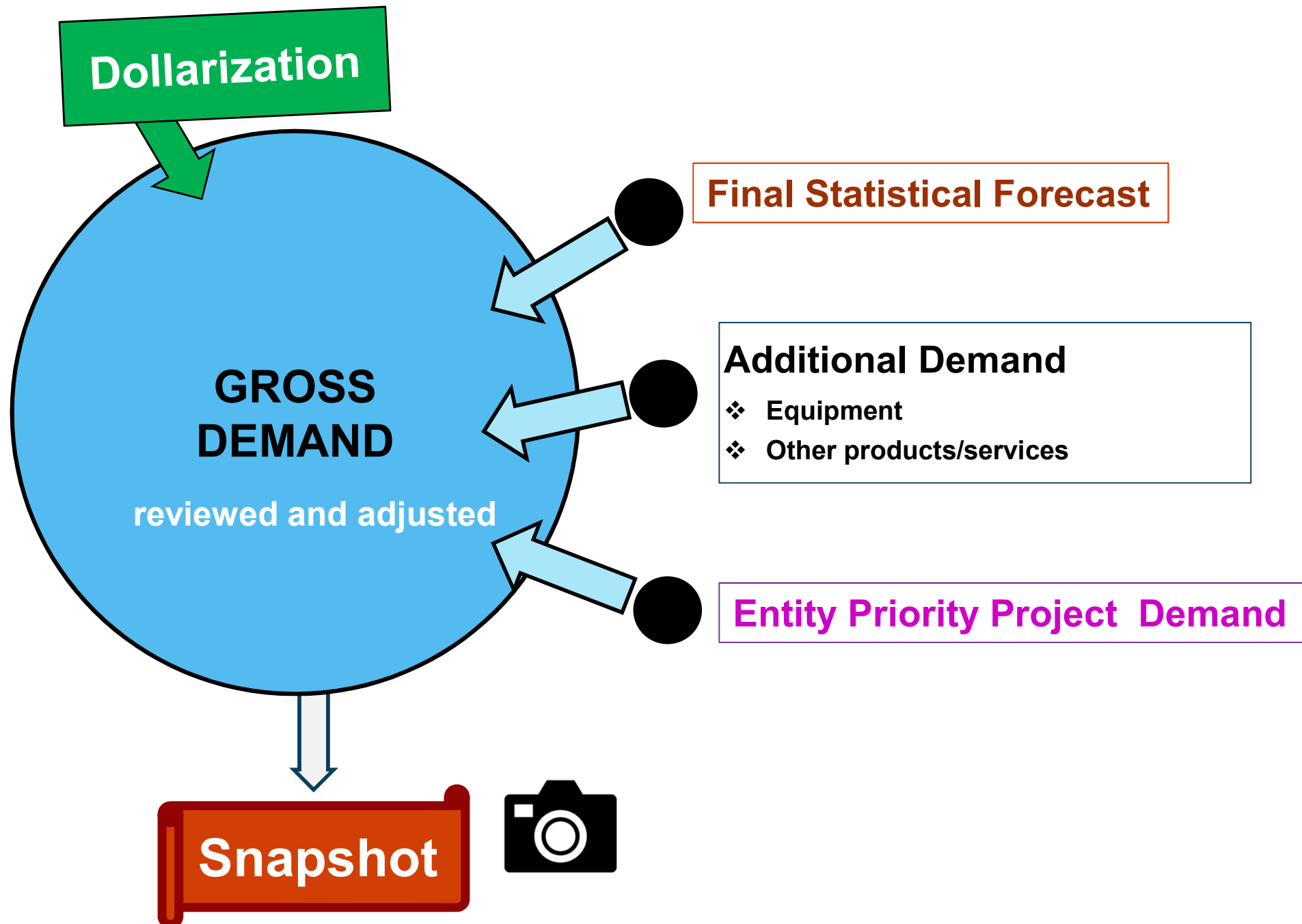
Equipment and Additional Demand

It allows to capture new requirements for which there is no historical consumption to use as baseline for forecasting.
It also includes Equipment replacement.

❖ Events

❖ Products <u>without historical Data</u>

Equipment Demand

Additional Demand
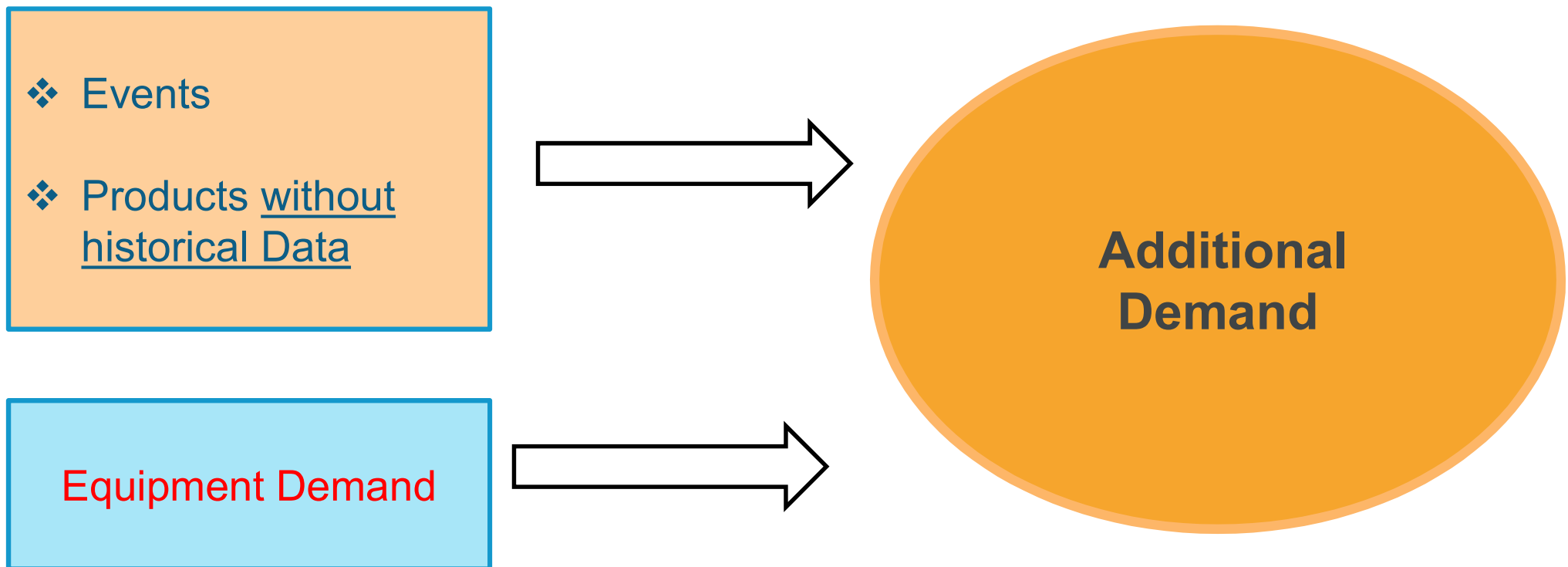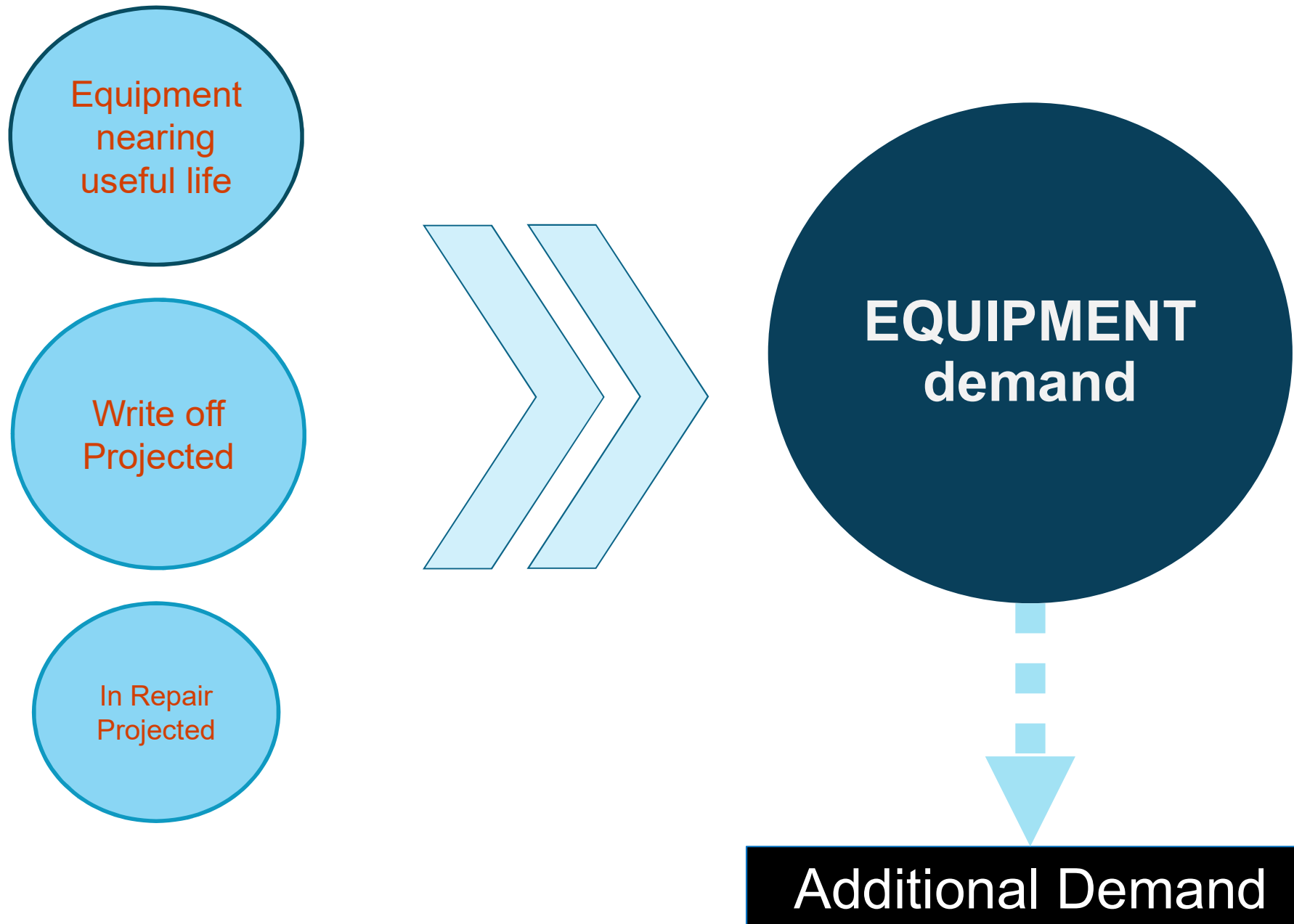
➢ Consumption History includes <u>Goods Receipt for</u> consumption POs and <u>Goods issues from inventory</u>.

➢ The Final History **does not include** the **Equipment "in Inventory" and "in Use"** that will soon cease to be used and therefore needs to be replaced.

➢ The Final History **does not include Equipment** that **will be Written-off or In-Repair** in future months.

➢ The **Statistical Forecast** might need to be cross-checked with the **Additional Demand** derived from this Equipment review.

Dollarization and Gross Demand

Dollarization

GROSS DEMAND

reviewed and adjusted

Final Statistical Forecast

Additional Demand
- ❖ Equipment
- ❖ Other products/services

Entity Priority Project Demand

Snapshot

➢ The DPSNP Solution facilitates the management of the unit price to calculate the dollar value of the Gross Demand

➢ The system retrieves different unit prices from multiple sources and determines the final price according to the below order (Fair Market Value Fixed/variable, Contract, Purchase Order, Moving Average Price)

Final Price

FMV (Fixed/Var)

Contract

PO

MAP

Unit of Measure

✕ **Quantity** **=** **$**
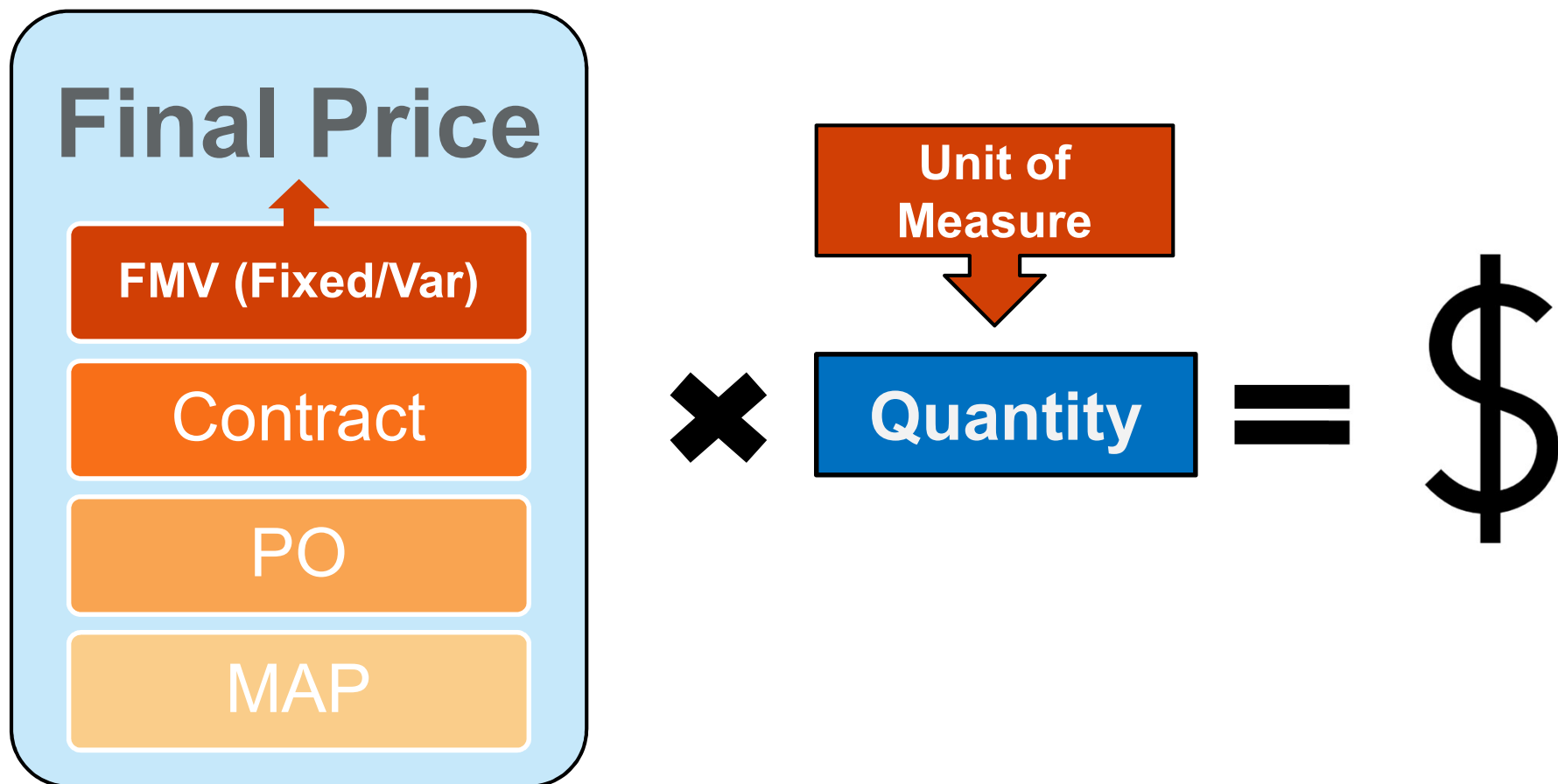
Snapshot

❖ It allows to save the 24 months Gross Demand Plan monthly and yearly, so it is possible to see the evolution of the Rolling Plan.

Thank you!