Supply Chain BI – Demand Planning & S&OP

By
NABIL BEN KHALED

Problem Statement

Organizations managing a large number of SKUs face major difficulties in daily supply chain monitoring and planning. Operational data related to **production, inventory, sales, and raw materials** is often stored across multiple spreadsheets.

Every day, teams spend **at least 2 hours manually copying and pasting data from sheet to sheet** to track:

- Quantities produced
- Current inventory levels
- Sales quantities
- Remaining quantities to produce to meet sales objectives and forecasts
- Required raw material quantities based on production needs
- Production rates and lead times

This manual process is **time-consuming, error-prone, and not scalable**, making it difficult to obtain a real-time, consolidated view of the supply chain and to support effective **Demand Planning and S&OP decision-making**.

Project Objectives

The objective of this project is **to automate supply chain data analysis** by centralizing production, inventory, sales, BOM, and S&OP data into a single **Power BI model**, **enabling accurate demand planning**, **production monitoring**, **and raw material requirement analysis**.

Data Sources and Inputs

- S&OP Planning Data
- Bill of Material
- excel sheets exported form the ERP software of: Production, Inventory, Sales

Solution Overview

Data Model:

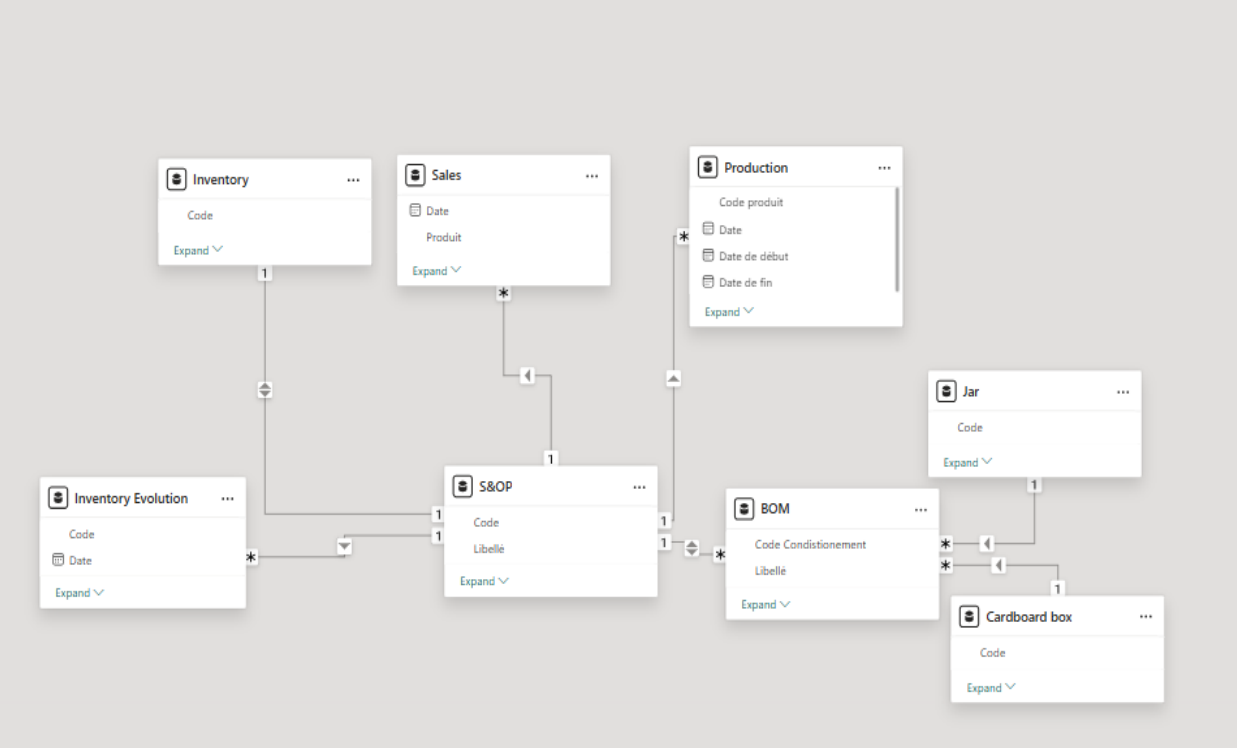


Figure 01: Data Model

Data Model Explanation

The data model is built using a **dimensional approach**. Two main dimension tables were created. The first contains **product descriptive attributes** such as product size, product type, client, and sales forecast per product. The second dimension **defines the Bill of Materials (BOM)** for each product as an excel sheets.

These dimensions are linked to **ERP excel fact tables** including production, inventory, and sales, enabling consolidated supply chain analysis and automated demand planning in Power BI.

Sales Dashboard

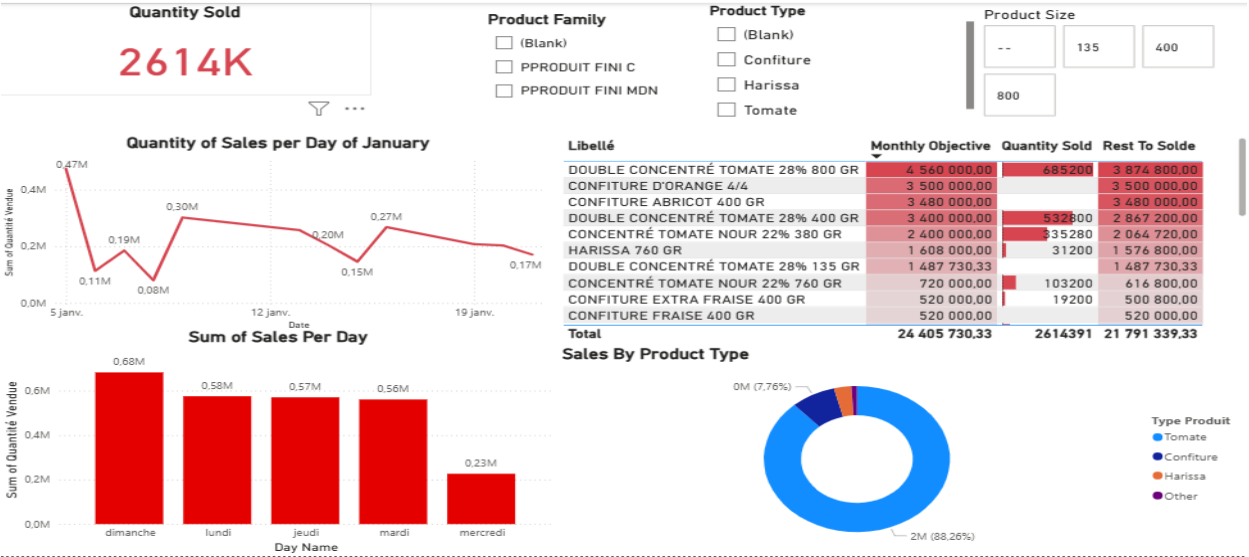


Figure 02: Sales Dashboard

Purpose

- Monitor sales performance and evolution
- Track progress toward sales objectives

Visuals

- **Line Chart**: Quantity sold by day
- **Matrix** :
    - Sales objective per product
    - Quantity sold per product
    - Remaining quantity to fulfill the objective
- **Pie Chart**: Quantity sold by product type

Business Value

- Quick visibility on sales performance
- Easy identification of gaps vs objectives
- Supports demand planning and S&OP decisions

Production Dashboard

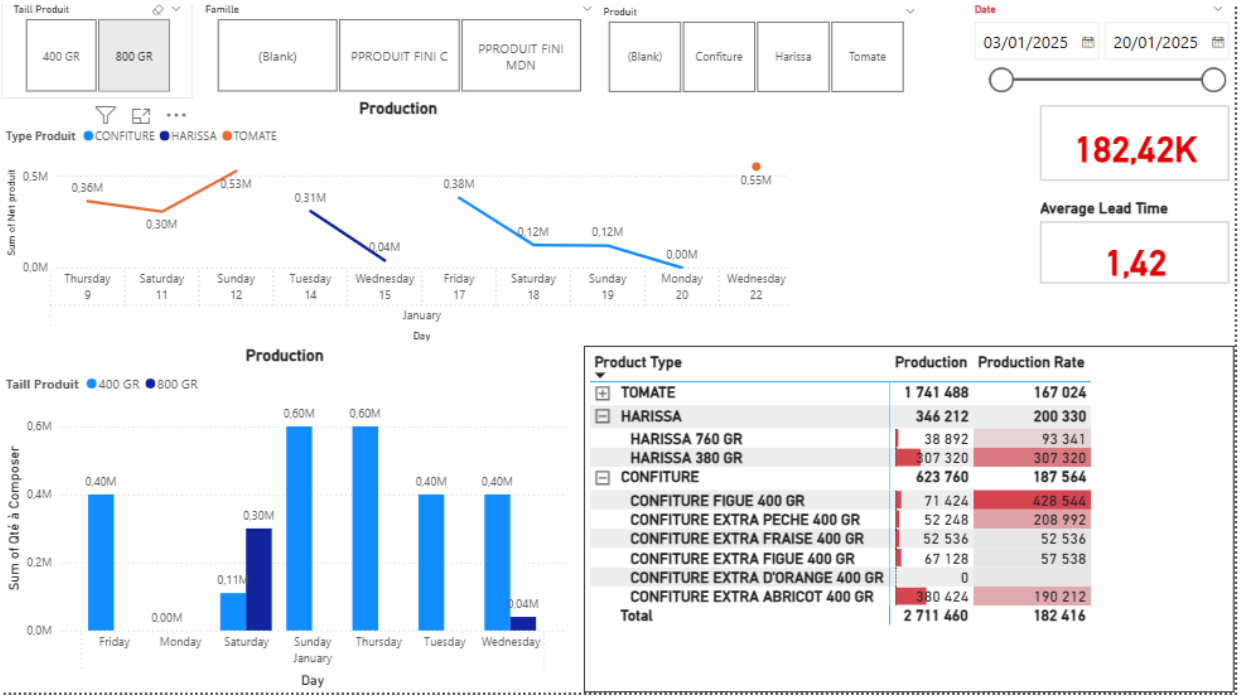


Figure 03: Production Dashboard

Purpose

- Monitor daily production performance
- Track production efficiency and delays

Visuals

- **Bar Chart**: Production quantity by day
- **Table**:
    - Production quantity by product
    - Average production rate
    - Average lead time

Business Value

- Identifies production delays and capacity issues
- Supports production planning and S&OP alignment

Inventory Dashboard

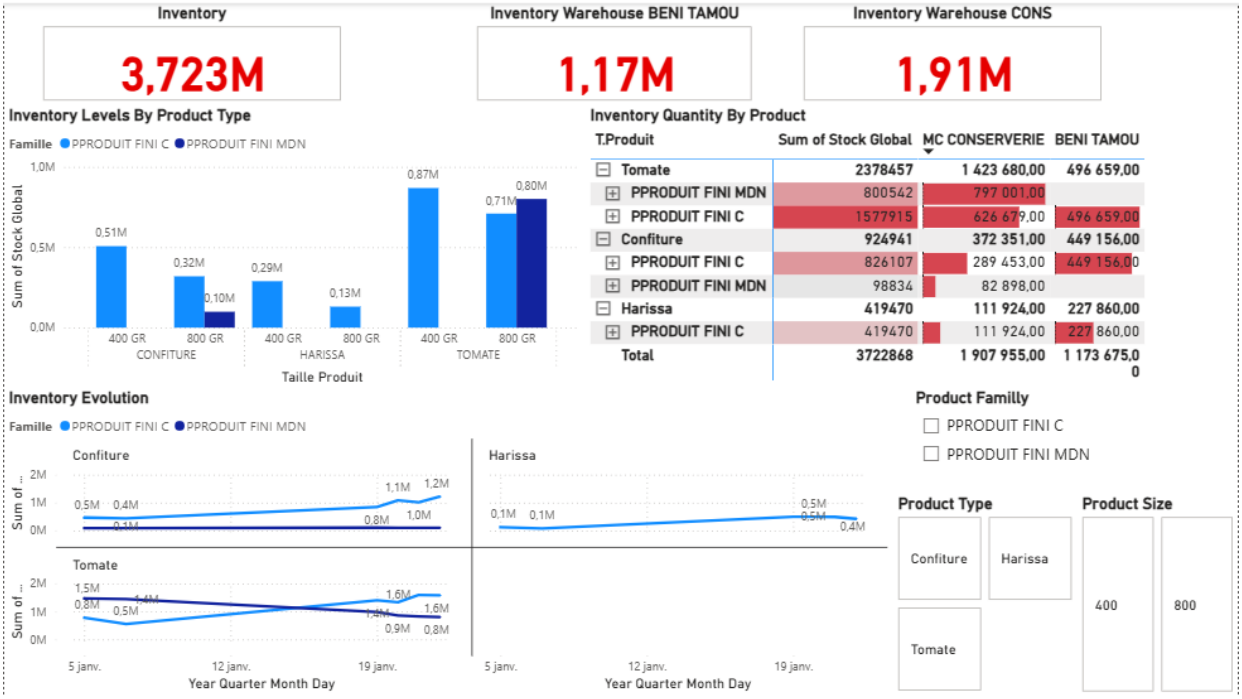


Figure 04: Inventory Dashboard

Purpose

- Monitor inventory levels and daily stock evolution
- Track stock distribution across Warehouse

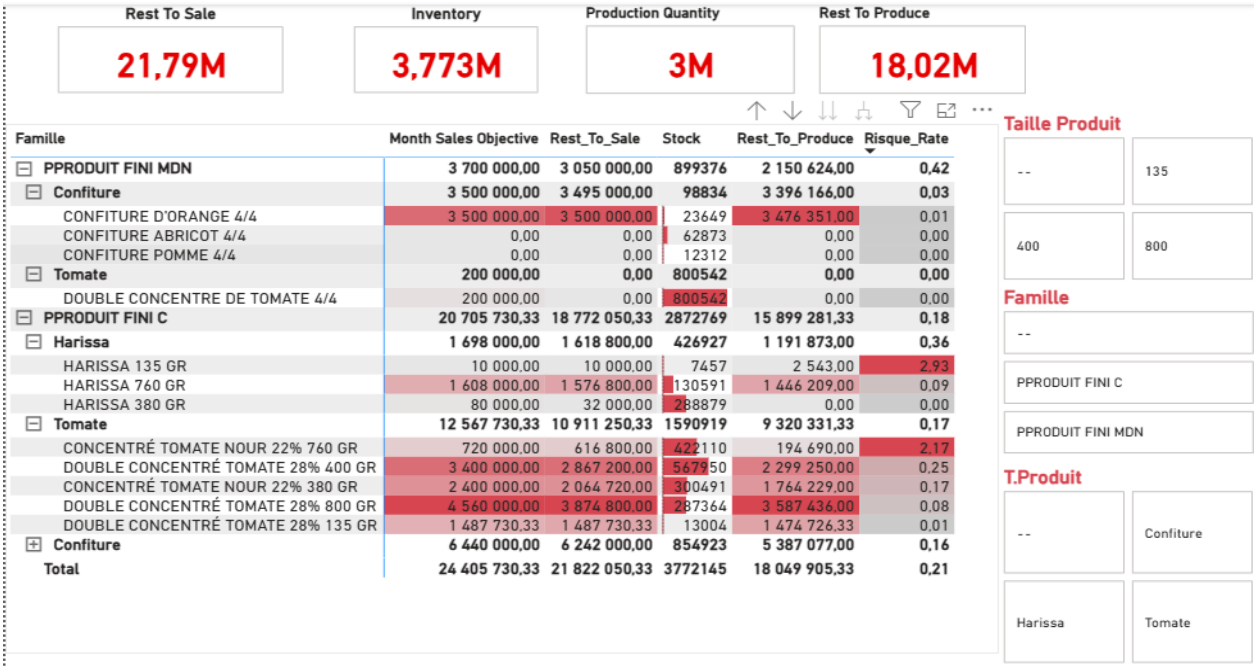
Visuals

- **Line Chart**: Inventory evolution by day
- **Matrix** :
    - Quantity per product in Warehouse 1
    - Quantity per product in Warehouse 2
    - Total quantity per product

Business Value

- Provides clear visibility of stock levels
- Supports inventory control and stock planning decisions

S&OP Dashboard



Famille	Month Sales Objective	Rest_To_Sale	Stock	Rest_To_Produce	Risque_Rate
PPRODUIT FINI MDN	3 700 000,00	3 050 000,00	899376	2 150 624,00	0,42
Confiture	3 500 000,00	3 495 000,00	98834	3 396 166,00	0,03
CONFITURE D'ORANGE 4/4	3 500 000,00	3 500 000,00	23649	3 476 351,00	0,01
CONFITURE ABRICOT 4/4	0,00	0,00	62873	0,00	0,00
CONFITURE POMME 4/4	0,00	0,00	12312	0,00	0,00
Tomate	200 000,00	0,00	800542	0,00	0,00
DOUBLE CONCENTRE DE TOMATE 4/4	200 000,00	0,00	800542	0,00	0,00
PPRODUIT FINI C	20 705 730,33	18 772 050,33	2872769	15 899 281,33	0,18
Harissa	1 698 000,00	1 618 800,00	426927	1 191 873,00	0,36
HARISSA 135 GR	10 000,00	10 000,00	7457	2 543,00	2,93
HARISSA 760 GR	1 608 000,00	1 576 800,00	130591	1 446 209,00	0,09
HARISSA 380 GR	80 000,00	32 000,00	288879	0,00	0,00
Tomate	12 567 730,33	10 911 250,33	1590919	9 320 331,33	0,17
CONCENTRÉ TOMATE NOUR 22% 760 GR	720 000,00	616 800,00	422110	194 690,00	2,17
DOUBLE CONCENTRÉ TOMATE 28% 400 GR	3 400 000,00	2 867 200,00	567950	2 299 250,00	0,25
CONCENTRÉ TOMATE NOUR 22% 380 GR	2 400 000,00	2 064 720,00	300491	1 764 229,00	0,17
DOUBLE CONCENTRÉ TOMATE 28% 800 GR	4 560 000,00	3 874 800,00	287364	3 587 436,00	0,08
DOUBLE CONCENTRÉ TOMATE 28% 135 GR	1 487 730,33	1 487 730,33	13004	1 474 726,33	0,01
Confiture	6 440 000,00	6 242 000,00	854923	5 387 077,00	0,16
Total	24 405 730,33	21 822 050,33	3772145	18 049 905,33	0,21

Figure 05: S&OP Dashboard

Purpose

- Monitor overall supply chain alignment with sales and production plans
- Track remaining quantities to sell and produce, inventory levels, and potential stock risks

Visuals

- **Matrix** :
    - Sales Objective
    - Rest to Sale
    - Rest to Produce
    - Risk Rate (Risque de Rupture)

Business Value

- Provides a consolidated view of demand vs production
- Identifies stock gaps and potential shortages
- Supports S&OP decision-making and production planning

Packaging Demand Dashboard

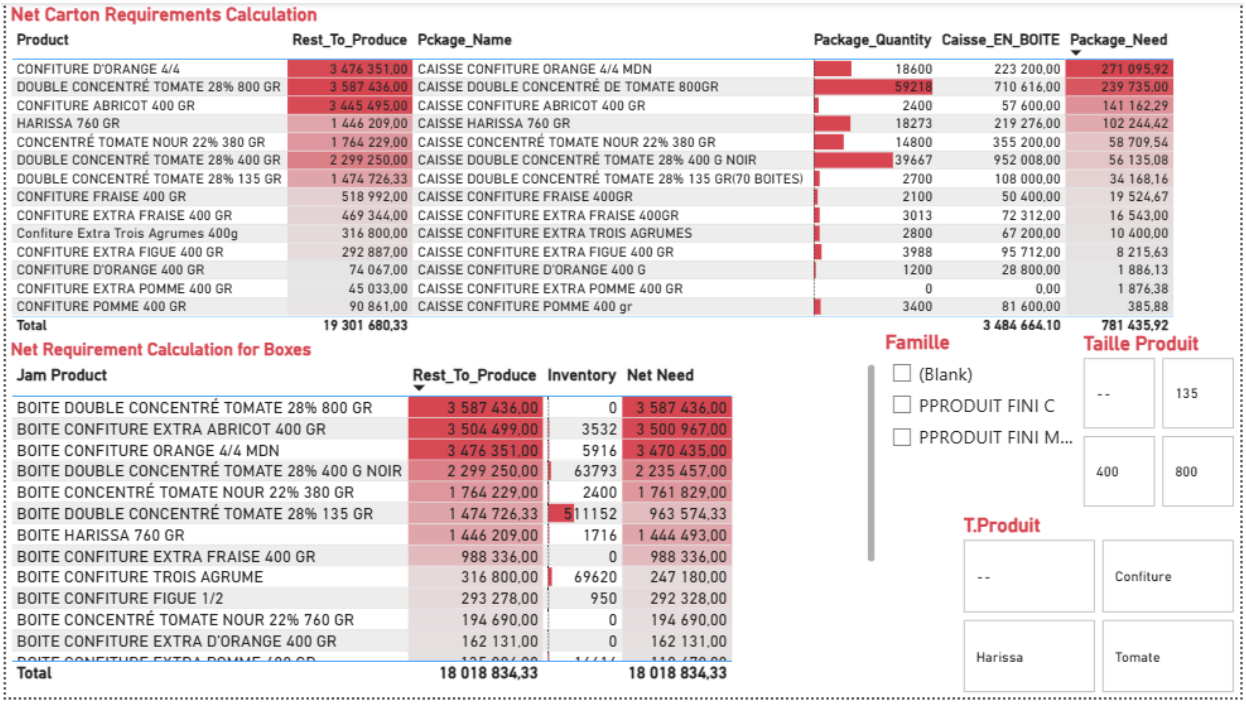


Figure 06: Packaging Demand Dashboard

Purpose

- Calculate packaging requirements to meet production objectives
- Track boxes and packages needed for production planning

Tables / Visuals

- **Table 1**: Packages needed to fulfill production objectives
- **Matrix 2**: Boxes needed to fulfill production objectives

Business Value

- Helps plan packaging and logistics accurately
- Ensures production targets are supported by sufficient packaging resources