



THE PREDICTIVE POINTERS

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ABSTRACT

This project develops a smart inventory management and sales prediction system for small and medium-sized businesses to maintain optimal stock levels and improve decision-making. By integrating a backend, database, and frontend, the system provides real-time monitoring, automated alerts, and predictive insights. Using Meta's Prophet model, it forecasts future demand from historical sales data. Through an intuitive dashboard, users can view detailed SKU-level and overall inventory analytics to enhance visibility and operational efficiency.

TOOGTON COMPANY'S BACKGROUND

Toogtons Innovator Co., Ltd. is a Thai apparel company founded in 2023 in Bangkok by Nirut Sae-Eia. The brand Toogtons (ทุกตอตัน) started from street sales and is now known for its ultra-soft “marshmallow” boxers and casualwear.

Nature of Business: Design, production, and online retail of comfortable undergarments and casualwear, primarily through Shopee, Lazada, and its official website, serving customers across Southeast Asia.

Mission: To redefine everyday comfort with soft, stylish, and accessible clothing.

Vision: To become Southeast Asia's leading comfortwear brand, recognized for innovation, quality, and customer-focused design.



PAJARA COMPANY'S BACKGROUND

Pajara Company Limited is a Thai apparel company registered on 2 April 2014 and based in Bangkok.

Nature of Business: The company is engaged in the design, manufacture, wholesale and retail of outerwear and other garments for men, women and infants. Specifically, it provides production services for outer garments and retails licensed-character sleepwear and casualwear under the brand "Pajara Pajamas".

Mission: To deliver fashionable, comfortable genuine licensed sleepwear and casual apparel to a broad audience, combining recognized character-branding with accessible quality design.

Vision: To be a recognized leader in the Thailand apparel market for licensed-character and casual sleepwear by focusing on design, quality and distribution.



CONCEPTS & RELATED THEORIES

The model prediction consists of 2 parts; The data, and the prediction model.

First, the data collection goes through the generic data pipeline (Collection, Extract, Transform, Load, Normalization and Analysis). Once the data has been collected, transformed, it is gets put into a database.

The prophet model uses machine learning to preform time-series forecasting on the chosen products by using statistics to predict changes seasonally, which is typically used for Weather forecasting, seasonal cycles, and sales prediction.

PROBLEMS

1

LIMITED VISIBILITY

Without any real-time stock tracking, this leads to stockouts and missed sales

2

SUBOPTIMAL REORDERING

Inefficient reordering results in uneven stock levels that lack proper data insight

3

NO DEMAND PREDICTION

Without future predictions, future marketing decisions will be made without the insight given by the forecast

PROBLEMS

INEFFECTIVE SKU MANAGEMENT

Underperforming products slip by undetected without a proper management system

4

HIGH OPERATIONAL COSTS

Manually compiling sales and stock data is time-consuming, prone to error and costly

5

OBJECTIVES

01

INTERACTIVE INVENTORY DASHBOARD

A dynamic and customizable view of all stock levels and products

02

PREDICTIVE SALES FORECASTING

Historical sales data is utilized to predict future sales over a specific period of time

03

AUTOMATED LOW STOCK ALERTS

Users are notified when certain stock falls below a set threshold

04

DYNAMIC SKU CATEGORIZATION

Products are automatically classified into active and dead stocks

SCOPE

01

INTERACTIVE INVENTORY DASHBOARD

Use FASTAPI Backend and
Nextjs frontend to develop it

02

PREDICTIVE SALES FORECASTING

Use Prophet model to
predict with some
accuracy

03

AUTOMATED LOW STOCK ALERTS

Display the low stock skus on
the website

04

DYNAMIC SKU CATEGORIZATION

Perform proper ETL to group
data into categories

BENEFITS

1

IMPROVED DATA VISUALIZATION

With the cleaned data users will have an easier time parsing the data and gaining new insights from it

2

AUTOMATED LOW STOCK NOTIFICATION SYSTEM

Users can now more efficiently and optimally reorder stock

3

SALES FORECASTING AND ANALYSIS

With the use of sales forecasting, users are able to have an idea of future sales that may benefit their future decisions

INTRODUCTION

- Our website provides businesses with real-time stock tracking and sales forecasting

STOCK MANAGEMENT

Clothing Inventory

Manage 5,209 SKUs • Default lead time: 14 days • Baseline threshold: 10 • Filter active: Active stock

Sales ready

Settings

⚠ Out of Stock

4,157

Items with zero stock

🟢 Active Stock

743

Active SKUs (recent sales)

📦 Dead Stock

4,248

No sales in last 6 months

🔄 Reorder Needed

4,530

Items below reorder point (uses lead time)

Product Inventory

Detailed view of all clothing SKUs

Upload Sales Data

Upload Stock Data

Upload SKUs Data

Search by name, SKU, brand, color, supplier...

All Categories

All Sizes

Clear All Filters

Showing 743 of 5,209 SKUs

Active filters: Active Stock

743 active items with recent sales

SKU	Product Details	Category	Stock Level	Sales Rate	Days Left	Status
TTTF136-M	M	Boxer Short Printed Fabr...	0	0.16 per day	0d	Out
TTTF131-M	(A3) สับปะรด -Pineapple (ผ้าฝ้าย)(M)	Boxer Short Printed Fabr...	13	0.41 per day	32d	Normal
TTTF105-M	(A3) อาโวคาโดเล็กพื้นเขียวเข้ม (ผ้าฝ้าย) New - avocado(M)	Boxer Short Printed Fabr...	668	1.91 per day	349d	Normal
TTTG135-M	(A4) Christmas กวางเรนเดียร์ -reindeer (ผ้าฝ้าย)(M)	Boxer Short Printed Fabr...	1	0.08 per day	12d	Low
TTTG140-M	(A4) Christmas ชนมั้งจิง(M)	Boxer Short Printed Fabr...	1	0.01 per day	179d	Low
TTTG141-M	(A4) Christmas ชวนค้าและสโนว์แมน(M)	Boxer Short Printed Fabr...	0	0.03 per day	0d	Out
TTTG108-M	(A4) จักรวาลพื้นฟ้า New - universe(M)	Boxer Short Printed Fabr...	334	1.03 per day	323d	Normal
TTTG109-M	(A4) จักรวาลพื้นเทาอ่อน New - universe(M)	Boxer Short Printed Fabr...	356	0.49 per day	728d	Normal
TTTG107-M	(A4) จักรวาลพื้นน้ำเงิน New - universe(M)	Boxer Short Printed Fabr...	612	0.87 per day	706d	Normal

← Back

(C5) สีพื้นดำ - black(XL)
SKU: TTP-010-XL

Current Stock

152

In Stock

Days of Inventory Remaining

∞

Based on 30-day avg sales

Sales Velocity

0.0

Units per day (30-day avg)

Sales Trend

→ 0.0%

Last 30 days vs previous 30

Best Selling Period

April 2025

1978 units sold

Worst Selling Period

May 2025

2 units sold

Active / Dead Status

Active

Active if sold within 6 months

Sales History

View product sales over time

Granularity

Monthly

View

By Channel

Channel

All Channels

Month	Facebook	Instagram	LINE	Lazada	Shopee	TikTok	unknown
Jan 2025	50	0	0	0	250	450	0
Feb 2025	100	0	0	0	350	450	0
Mar 2025	100	0	0	0	400	650	0
Apr 2025	150	0	0	0	500	1050	0
May 2025	100	0	0	0	550	550	0
Jun 2025	100	0	0	0	550	550	0
Jul 2025	50	0	0	0	150	250	0

Sales Summary

Total Period Sales:
7586 units

Average Monthly Sales:
1264 units

Best Month:
Apr 2025

DETAILED PRODUCT VIEW

Sales Analytics

View sales performance by channel

7586

Total Sales

0

Last 7 Days

TIKTOK TOOGTON

Top Channel

Sales by Channel

Channel Distribution

Channel	Units	Percentage
TIKTOK TOOGTON	4383	57.8%
Shopee	2407	31.7%
Facebook	563	7.4%
Shopee 2	116	1.5%
Lazada	96	1.3%

Market Share Analysis

Performance within Boxer Short Basic Plain (ผ้าฝ้าย ขาวโป้นและสีพื้น Size XL) category

Category Share

19.2%

of Boxer Short Basic Plain (ผ้าฝ้าย ขาวโป้นและสีพื้น Size XL)

Overall Share

1.8%

across all sales

Your Sales

7,586

units sold

Category Total

39,462

total units

Your Share of Category Sales

19.2%

7,586 / 39,462 units

Overall Market Share

1.82%

1.82% of all sales

Market Position

Overall market share of 1.82% across all sales, competing with 0 products in this category.

Inventory Summary

High-level overview of your inventory performance and health • Sales rate window: 180 days • 962 products with sales data

Stock Health Score

66.6/100

Multi-factor health assessment

Avg Days Until Stockout

135 days

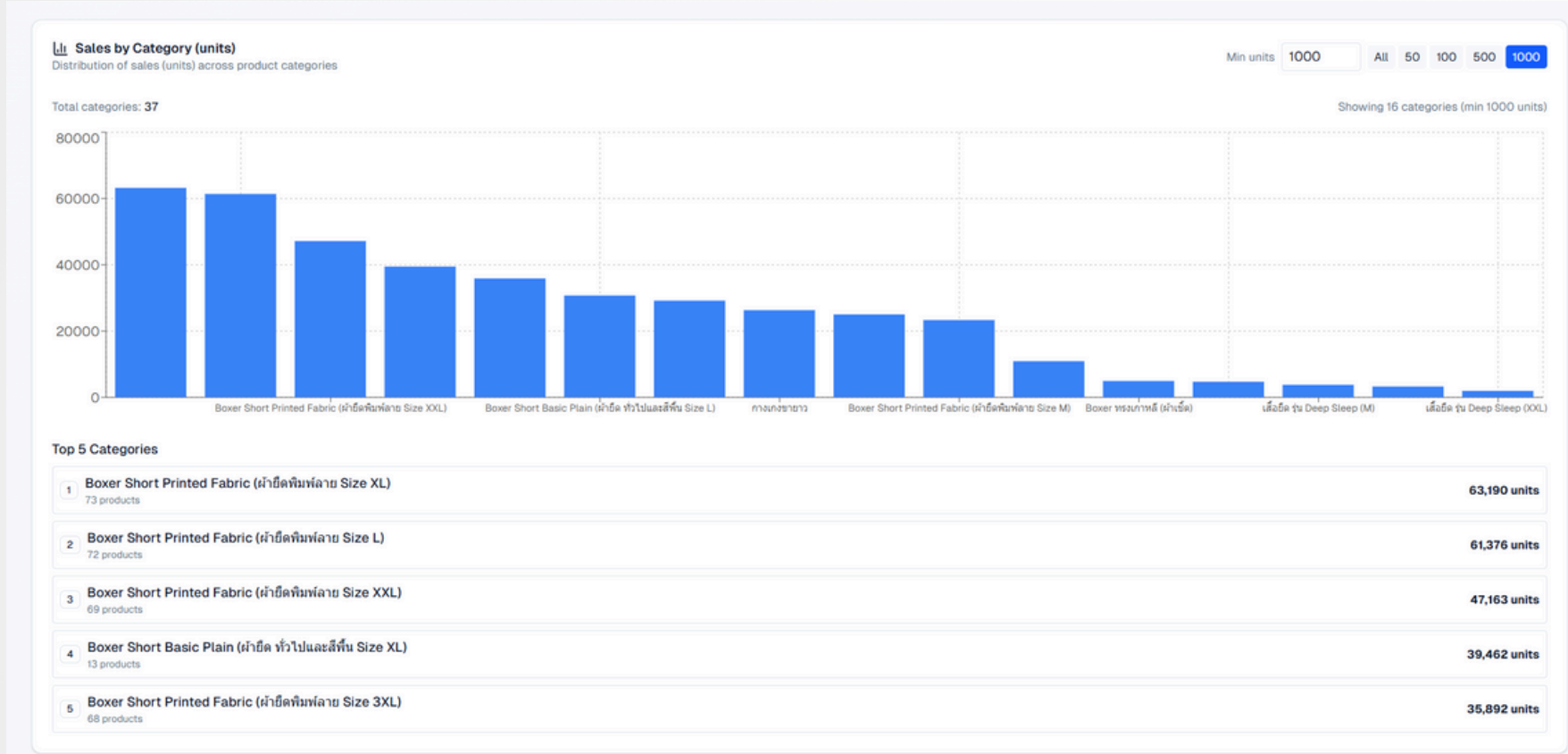
Weighted by sales velocity

Total Sales

417,098 units

Total units sold: 417,098

- Inventory Longevity
- Category Breakdown
- Top Performers
- Overall Sales



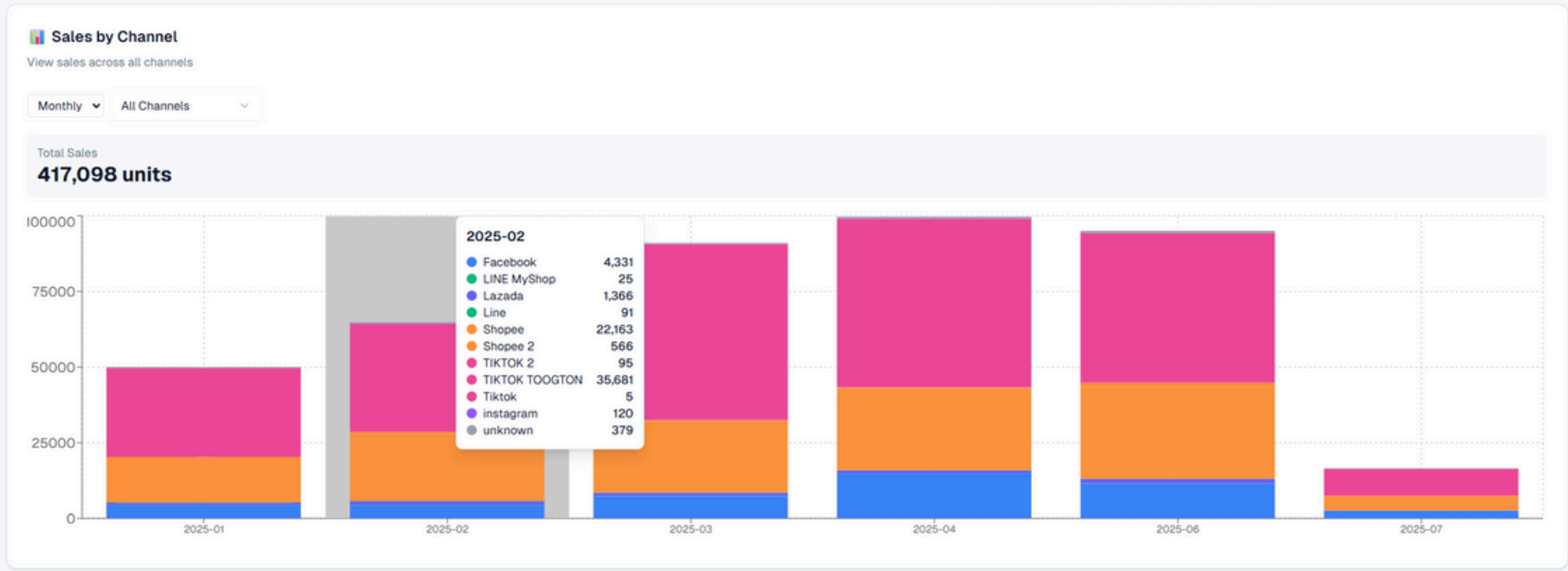
ANALYTICS

Top Performing Products

Products with highest sales velocity and multi-channel performance

Show top 10 SKUs

1	(C5) เสื้อผ้า - black(XL) TTP-B10-XL • Top: TikTok • 7 channels	152 in stock	7,586 sold
2	(C5) เสื้อผ้า - black gray(XL) TTP-B11-XL • Top: TikTok • 7 channels	229 in stock	6,935 sold
3	(C5) เสื้อผ้า - dark gray(XL) TTP-B07-XL • Top: TikTok • 7 channels	5 in stock	5,839 sold
4	(D5) เสื้อผ้า - black(XXL) TTP-B10-XXL • Top: TikTok • 6 channels	14 in stock	5,625 sold
5	(B5) เสื้อผ้า - black(L) TTP-B10-L • Top: TikTok • 6 channels	0 in stock	5,526 sold
6	(B5) เสื้อผ้า - black gray(L) TTP-B11-L • Top: TikTok • 8 channels	0 in stock	5,376 sold
7	(C5) เสื้อผ้า - navy blue(XL) TTP-B12-XL • Top: TikTok • 7 channels	225 in stock	5,215 sold
8	(B5) เสื้อผ้า - dark gray(L) TTP-B07-L • Top: TikTok • 8 channels	0 in stock	5,027 sold
9	(D5) เสื้อผ้า - black gray(XXL) TTP-B11-XXL • Top: TikTok • 6 channels	18 in stock	4,871 sold
10	(C5) เสื้อผ้า - earthy gray(XL) TTP-B13-XL • Top: TikTok • 7 channels	485 in stock	4,830 sold



SALES PREDICTION

Sales Predictions

AI-powered sales forecasts for inventory planning

Top 20 SKUs

12 Weeks

Refresh

SKU Forecasts	Category Forecasts	Channel Forecasts	Forecast Period
20 Individual products	10 Product categories	10 Sales channels	12 Weeks 84 days prediction

Forecasts		
Click on any card to expand and view detailed weekly predictions		
SKUs	Categories	Channels
(C5) สีพื้นดำ - black(XL) TTP-010-XLBoxer Short Basic Plain (ผ้ายัดหัวไปและลิ้น Size XL) 4,696Total 12 Weeks 55.9Avg per Day MAE: 106.32MAPE: 143.77% 12-Week Forecast Jul 6-12, 2025790 units Jul 13-19, 2025704 units Jul 20-26, 2025459 units Jul 27 - Aug 2, 2025228 units Aug 3-9, 2025193 units Aug 10-16, 2025347 units Aug 17-23, 2025503 units Aug 24-30, 2025467 units	(C5) สีพื้นเทาดำ - black gray(XL) TTP-011-XLBoxer Short Basic Plain (ผ้ายัดหัวไปและลิ้น Size XL) 14,903Total 12 Weeks 177.4Avg per Day MAE: 49.27MAPE: 93.47%	(C5) สีพื้นเทาเข้ม - dark gray(XL) TTP-007-XLBoxer Short Basic Plain (ผ้ายัดหัวไปและลิ้น Size XL) 1,691Total 12 Weeks 20.1Avg per Day MAE: 33.43MAPE: 57.99%
(D5) สีพื้นดำ - black(XXL) TTP-010-XXLBoxer Short Basic Plain (ผ้ายัดหัวไปและลิ้น Size XXL) 6,751Total 12 Weeks 80.4Avg per Day MAE: 25.71MAPE: 44.64%	(B5) สีพื้นดำ - black(L) TTP-010-LBoxer Short Basic Plain (ผ้ายัดหัวไปและลิ้น Size L) 2,707Total 12 Weeks 32.2Avg per Day MAE: 43.90MAPE: 79.25%	(B5) สีพื้นเทาดำ - black gray(L) TTP-011-LBoxer Short Basic Plain (ผ้ายัดหัวไปและลิ้น Size L) 8,385Total 12 Weeks 99.8Avg per Day MAE: 40.92MAPE: 122.92%

Forecasts

Click on any card to expand and view detailed weekly predictions

SKUs	Categories	Channels
Boxer Short Printed Fabric (ผ้ายัดพื้มพลาย Size XL) Category Forecast 27,086Total 12 Weeks 322.5Avg per Day MAE: 205.18MAPE: 45.08%	Boxer Short Printed Fabric (ผ้ายัดพื้มพลาย Size L) Category Forecast 36,564Total 12 Weeks 435.3Avg per Day MAE: 249.91MAPE: 64.88%	Boxer Short Printed Fabric (ผ้ายัดพื้มพลาย Size XXL) Category Forecast 32,143Total 12 Weeks 382.7Avg per Day MAE: 289.38MAPE: 87.03%
Boxer Short Basic Plain (ผ้ายัด หัวไปและสีพื้น Size XL) Category Forecast 23,013Total 12 Weeks 274.0Avg per Day MAE: 216.64MAPE: 62.63%	Boxer Short Printed Fabric (ผ้ายัดพื้มพลาย Size 3XL) Category Forecast 20,129Total 12 Weeks 239.6Avg per Day MAE: 261.81MAPE: 96.27%	Boxer Short Basic Plain (ผ้ายัด หัวไปและสีพื้น Size L) Category Forecast 15,791Total 12 Weeks 188.0Avg per Day MAE: 124.38MAPE: 51.86%
Boxer Short Basic Plain (ผ้ายัด หัวไปและสีพื้น Size XXL) Category Forecast 17,548Total 12 Weeks 208.9Avg per Day MAE: 132.08MAPE: 54.90%	กางเกงขามาว Category Forecast 38,780Total 12 Weeks 461.7Avg per Day MAE: 339.82MAPE: 138.41%	Boxer Short Basic Plain (ผ้ายัด หัวไปและสีพื้น Size 3XL) Category Forecast 15,516Total 12 Weeks 184.7Avg per Day MAE: 105.48MAPE: 43.70%
Boxer Short Printed Fabric (ผ้ายัดพื้มพลาย Size M) Category Forecast 11,989Total 12 Weeks 142.7Avg per Day MAE: 132.84MAPE: 91.59%		

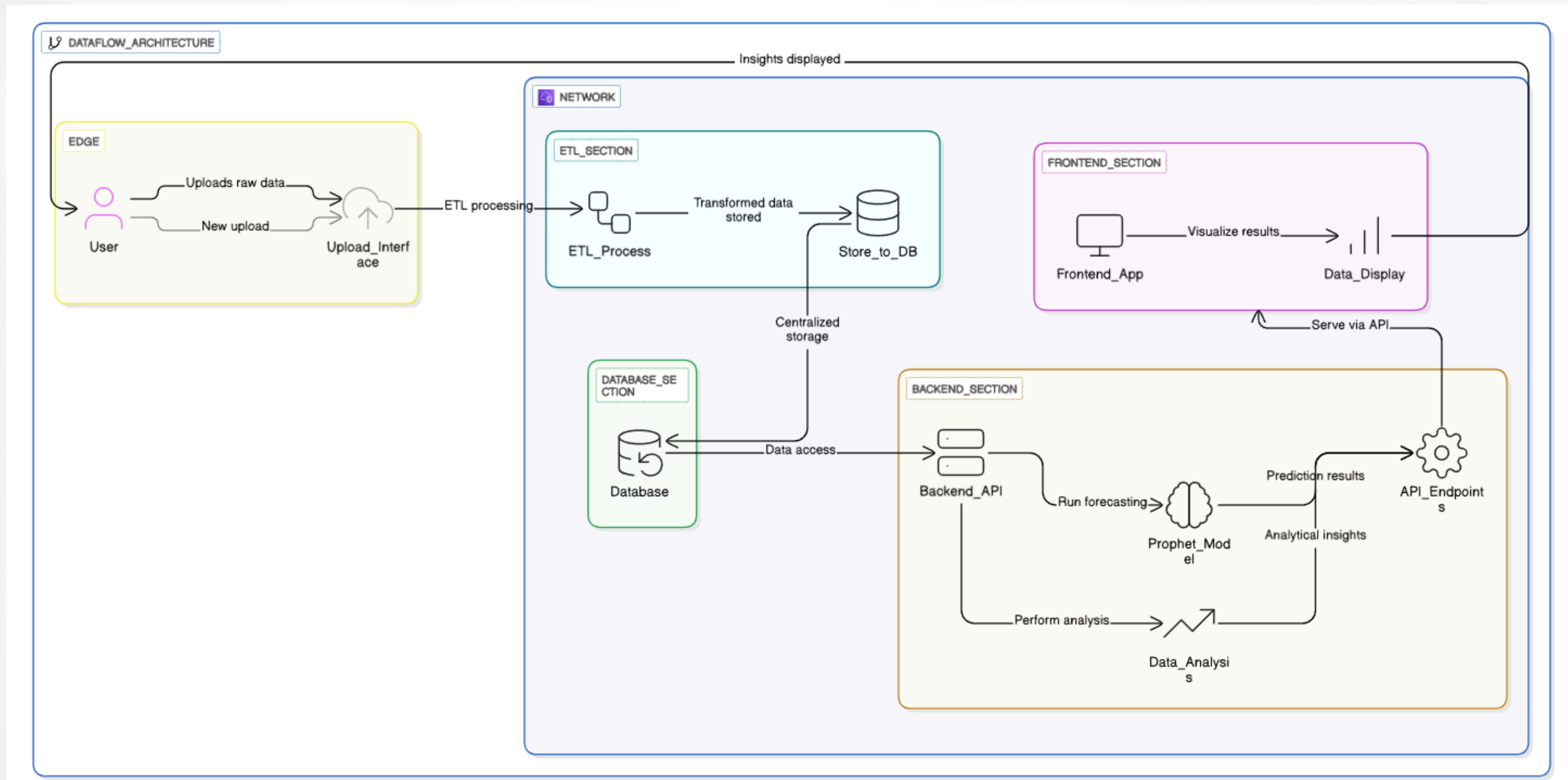
Forecasts

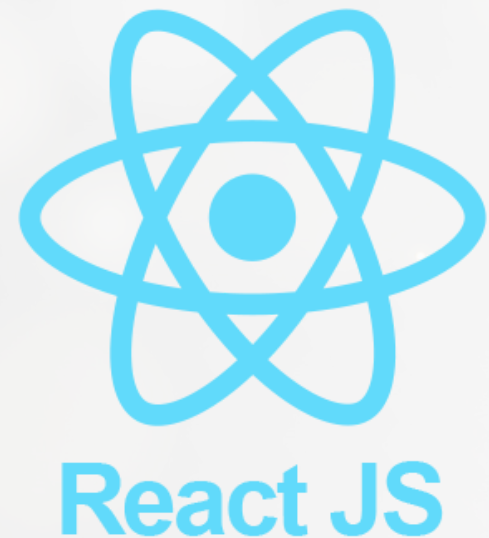
Click on any card to expand and view detailed weekly predictions

SKUs	Categories	Channels
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(C5) สีพื้นกรมท่า - navy blue(XL) TTP-012-XLBoxer Short Basic Plain (ผ้ายัด หัวไปและลิ้น Size XL) 6,945Total 12 Weeks 82.7Avg per Day MAE: 34.92MAPE: 104.24%	(B5) สีพื้นเทาเข้ม - dark gray(L) TTP-007-LBoxer Short Basic Plain (ผ้ายัด หัวไปและลิ้น Size L) 2,840Total 12 Weeks 33.8Avg per Day MAE: 27.37MAPE: 99.08%	(D5) สีพื้นเทาดำ - black gray(XXL) TTP-011-XXLBoxer Short Basic Plain (ผ้ายัด หัวไปและลิ้น Size XXL) 6,694Total 12 Weeks 79.7Avg per Day MAE: 34.92MAPE: 83.73%
(C5) สีพื้นเทาหิน - earthy gray(XL) TTP-013-XLBoxer Short Basic Plain (ผ้ายัด หัวไปและลิ้น Size XL) 1,037Total 12 Weeks 12.3Avg per Day MAE: 27.76MAPE: 78.60%	(E5) สีพื้นดำ - black(3XL) TTP-010-3XLBoxer Short Basic Plain (ผ้ายัด หัวไปและลิ้น Size 3XL) 4,247Total 12 Weeks 50.6Avg per Day MAE: 26.44MAPE: 374.10%	(E5) สีพื้นเทาดำ - black gray(3XL) TTP-011-3XLBoxer Short Basic Plain (ผ้ายัด หัวไปและลิ้น Size 3XL) 4,524Total 12 Weeks 53.9Avg per Day MAE: 36.84MAPE: 165.61%

DESIGN METHOD SYSTEM ARCHITECTURE

- Raw data are uploaded in the form of CSV files that is cleaned during the ETL process
- The cleaned data is stored a database
- The backend retrieves the data from the database to preform sales predictions and analysis that will be displayed on the frontend





PROPHET



DESIGN METHOD **DEVELOPMENT STACK**

Our development stack uses FastAPI, and supabase for the Backend, and React and Electron for the Frontend rendering of the desktop application. Alongside the Prophet model for sales prediction



DESIGN METHOD

DATABASE SCHEMA & BACKEND

API ENDPOINTS

Inventory Prediction API			0.1.0	OAS 3.1
/openapi.json				
default ^				
GET	/products	Get Products		▼
GET	/products/facets	Products Facets		▼
GET	/categories	Categories		▼
GET	/sales	Get Sales		▼
GET	/sales/top_skus	Top Skus		▼
GET	/sales/top_categories	Top Categories		▼
GET	/sales/{sku}	Sales By Sku		▼
GET	/skus	Get Skus		▼
GET	/stock	Get Stock		▼
GET	/stock/out_of_stock	Get Out Of Stock		▼
GET	/stock/low	Get Low Stock		▼
GET	/stock/activity	Get Stock Activity		▼
GET	/analytics/sales/timeseries	Get Sales Timeseries		▼
GET	/analytics/sales/by-channel	Get Sales By Channel		▼
GET	/analytics/sales/by-channel/sku	Get Sales By Channel Summary For Sku		▼
GET	/analytics/sales/market-share	Get Market Share For Sku		▼
GET	/analytics/sales/by-category	Get Sales By Category		▼

sales			
id	int4		
transaction_date	timestamp		
item_id	varchar		
platform	varchar		
quantity	int4		
stock			
id	int4		
raw_id	varchar		
name	varchar		
category	varchar		
quantity	int4		
skus			
id	int4		
raw_id	varchar		
name	varchar		
category	varchar		
subcategory	varchar		
size	varchar		
unit	varchar		

METHODOLOGY - CONCEUPTUAL STAGE

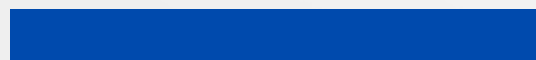
PREDICTION

MODEL

- Prophet is a machine-learning based tool for predictive analysis
- Prophet takes into consideration trend, seasonality and holidays

$$y(t) = g(t) + s(t) + h(t) + e(t)$$

- $y(t)$ = Prediction
- $g(t)$ = Trend
- $s(t)$ = Seasonality
- $h(t)$ = Holidays
- $e(t)$ = Error



METHODOLOGY - CONCEUPTUAL STAGE

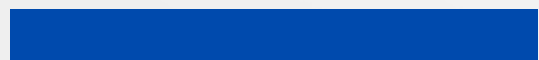
PREDICTION

MODEL

Growth Function

- Prophet uses a Piece-Wise Linear Model to forecast the sales data where the intercept and slope will change at the changepoint
- Changepoints (c) are the points in which a trend shifts directions

$$y = \begin{cases} \beta_0 + \beta_1 x, & \text{if } x \leq c \\ \beta_0 - \beta_2 c + (\beta_1 + \beta_2)x, & \text{if } x > c \end{cases}$$



METHODOLOGY - CONCEUPTUAL STAGE

PREDICTION

MODEL

Seasonality Function

$$s(t) = \sum_{n=1}^N \left(a_n \cos\left(\frac{2\pi nt}{P}\right) + b_n \sin\left(\frac{2\pi nt}{P}\right) \right)$$

- A Fourier Series that is able to approximate the cyclical data of seasonality
- P = The time period (weekly seasonality = 7, yearly seasonality = 365.25)
- N = The total order. The lower order provides a smoother, simpler curve, a higher order creates a more complex and somewhat spiky curve

METHODOLOGY - CONCEUPTUAL STAGE

PREDICTION

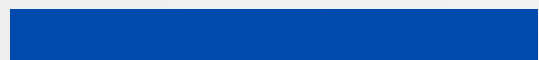
MODEL

Holiday Function

- A list of holidays are used and mapped onto the forecast depending on the country specified
- The model then adds or subtracts values from the forecast based on the historical data of said holidays

Error Function

- It is a statistical assumption about randomness or noise present in the data that cannot be explained

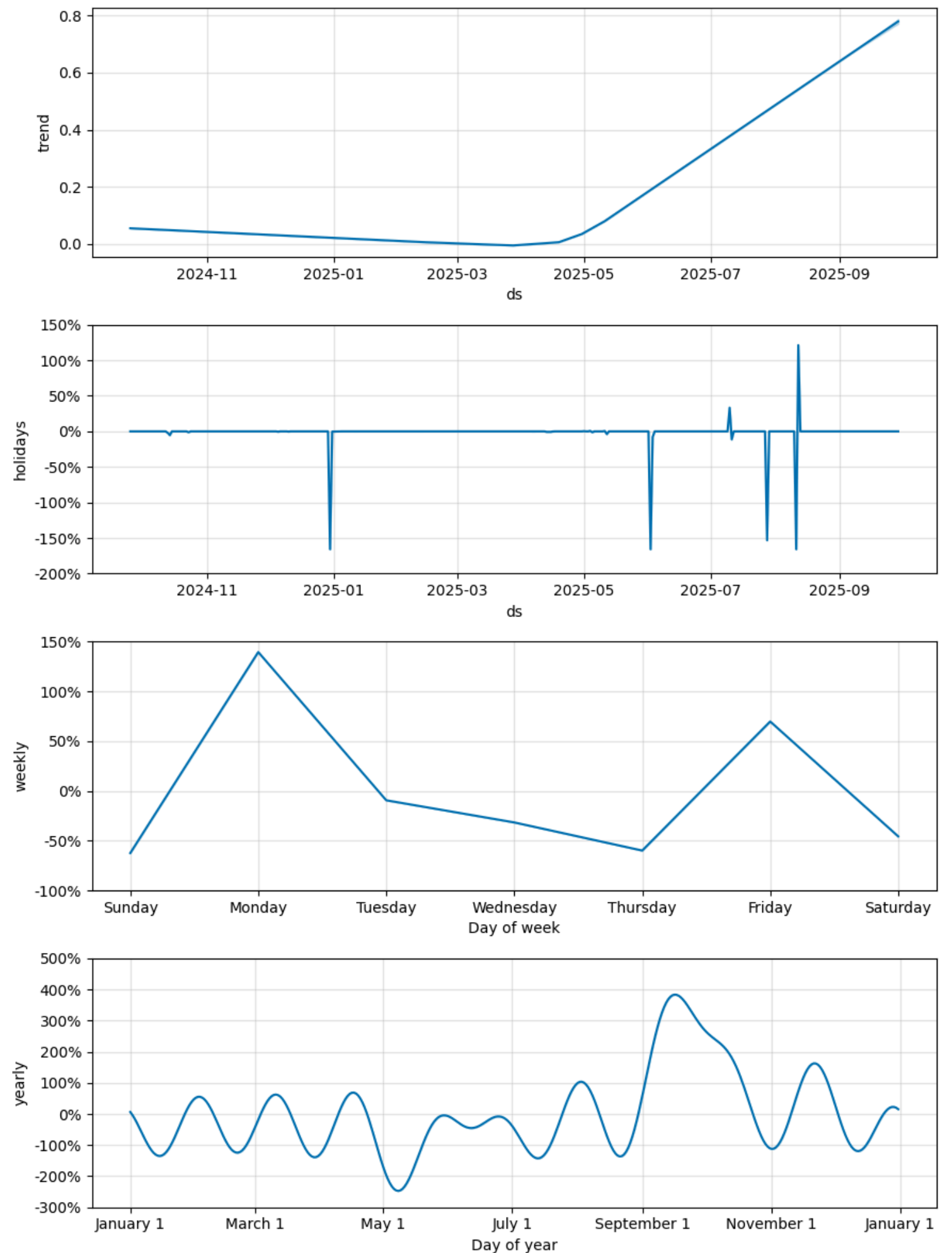


METHODOLOGY - CONCEUPTUAL STAGE

PREDICTION

MODEL

- **Trend:** Shows how well the product is selling overall
- **Holidays:** Shows how different holidays affect sales rate
- **Weekly:** Shows the weekly trend of sales
- **Yearly:** Shows the yearly trend of sales



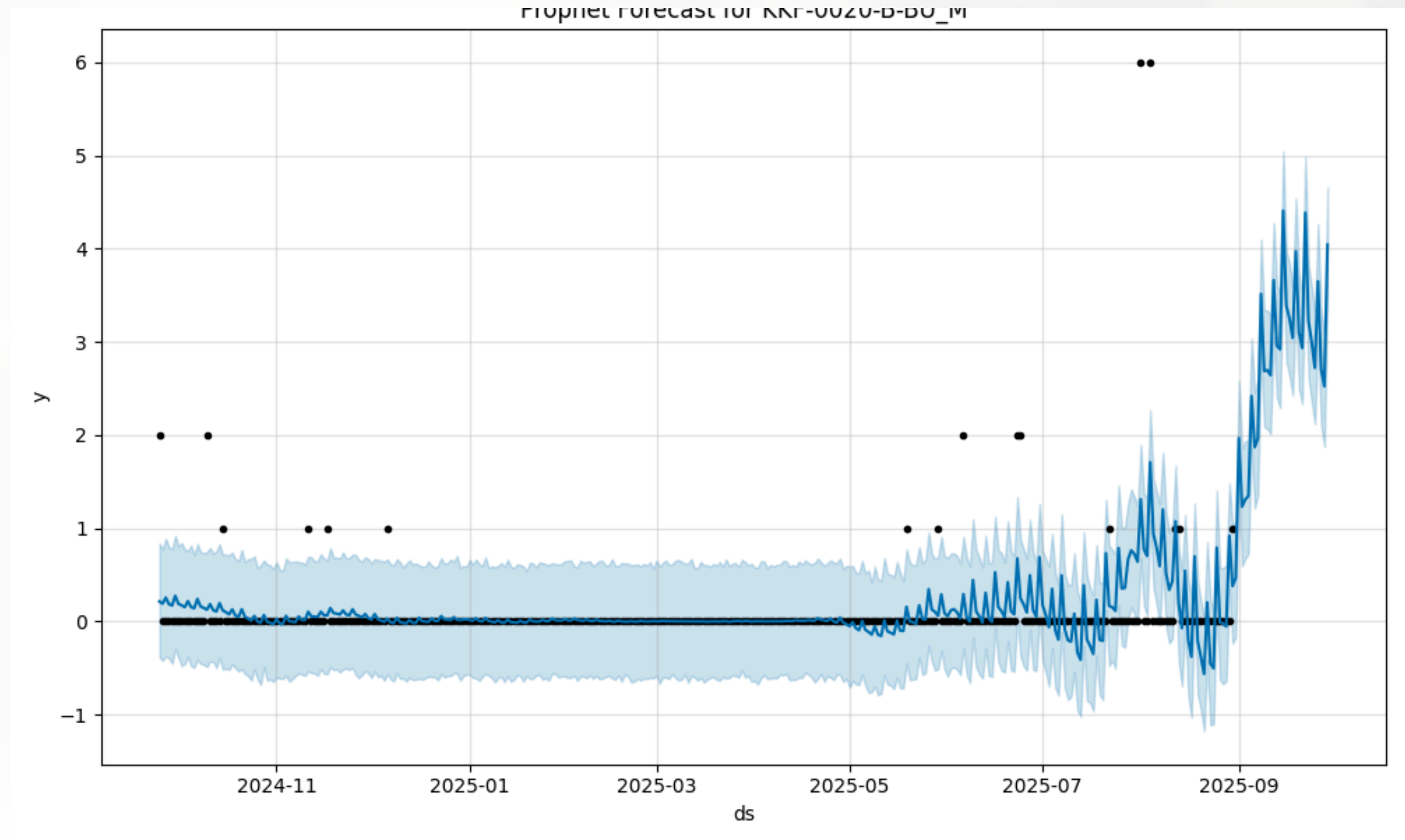
METHODOLOGY - CONCEUPTUAL STAGE

PREDICTION

MODEL

Example Prediction

- Black dots represent historical sales
- Blue line represents the predicted sales
- Light blue area represents the certainty of the prediction



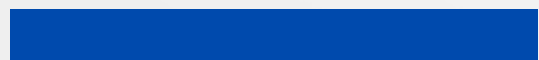
METHODOLOGY - CONCEUPTUAL STAGE

PREDICTION

MODEL

Accuracy Check

- The model splits the data into a testing set and a training set
- The model then uses the data from the training set to make a forecast, comparing it with the testing set
- The difference between the two is the accuracy



METHODOLOGY - IMPLEMENTATION STAGE

CALCULATIONS

Clothing Inventory
Manage 5,209 SKUs • Default lead time: 14 days • Baseline threshold: 10 • Filter active: Active stock

Sales ready Settings

1 **Out of Stock**
4,157
Items with zero stock

2 **Active Stock**
743
Active SKUs (recent sales)

3 **Dead Stock**
4,248
No sales in last 6 months

4 **Reorder Needed**
4,530
Items below reorder point (uses lead time)

Product Inventory
Detailed view of all clothing SKUs

Upload Sales Data Upload Stock Data Upload SKUs Data

Search by name, SKU, brand, color, supplier... All Categories All Sizes Active Stock

Clear All Filters

Showing 743 of 5,209 SKUs Active filters: Active Stock

SKU	Product Details	Category	Stock Level	5 Sales Rate	6 Days Left	Status
TTTF136-M	M	Boxer Short Printed Fabr...	0	0.00 per day	0d	Out
TTTF131-M	(A3) สีส้มเปรี้ยว-Pineapple (ผ้าฝ้าย)(M)	Boxer Short Printed Fabr...	13	0.41 per day	32d	Normal
TTTF105-M	(A3) ลาวาลาได้เล็กชิ้นเขียวเข้ม (ผ้าฝ้าย) New - avocado(M)	Boxer Short Printed Fabr...	668	1.91 per day	349d	Normal
TTTG135-M	(A4) Christmas กวางเรนเดียร์ -reindeer (ผ้าฝ้าย)(M)	Boxer Short Printed Fabr...	1	0.08 per day	12d	Low
TTTG140-M	(A4) Christmas ขนเมฆหิมะ(M)	Boxer Short Printed Fabr...	1	0.01 per day	179d	Low
TTTG141-M	(A4) Christmas ขนค่านและสโนว์แมน(M)	Boxer Short Printed Fabr...	0	0.03 per day	0d	Out
TTTG108-M	(A4) จักรวาลพื้นผ้า New - universe(M)	Boxer Short Printed Fabr...	334	1.03 per day	323d	Normal
TTTG109-M	(A4) จักรวาลพื้นเทาอ่อน New - universe(M)	Boxer Short Printed Fabr...	356	0.49 per day	728d	Normal
TTTG107-M	(A4) จักรวาลพื้นน้ำเงิน New - universe(M)	Boxer Short Printed Fabr...	612	0.87 per day	706d	Normal

1. Out of Stock: Stock level = 0 from provided data

2. Active Stock: Is active if the last sales date is within the specified period (Configure in setting)

3. Dead Stock: Is inactive if the last sales date is outside of the specified period (Configure in setting)

4. Reorder Needed: if stock level $\leq$ reorder_point. reorder_point = low stock threshold + (leadtime * daily salesrate)

5. Sales Rate: Total sales / period of sales (configurable in settings)

6. Days Left: Stock level / Daily sales rate

METHODOLOGY - IMPLEMENTATION STAGE

SETTINGS

Clothing Inventory

Manage 5,209 SKUs • Default lead time: 14 days • Baseline threshold: 10

Sales ready

Settings

Inventory Settings

Configure default values for inventory calculations and thresholds

Baseline Low-Stock Threshold

- 10 +

5 10 15 20

Used when a product's low-stock threshold is not set.

Sales Rate Window (days)

- 180 + Window to average sales for rate calculation

7d 14d 30d 90d

Default Lead Time (Days)

- 14 +

7d 14d 21d 30d

Time from order to delivery. Used for reorder point calculations.

Active / Dead Window (Months)

- 6 + Months to consider an SKU active (no sales within this window = dead)

3m 6m 9m 12m

Cancel

Save Settings

METHODOLOGY - IMPLEMENTATION STAGE

CALCULATIONS

Clothing Inventory
Manage 5,209 SKUs • Default lead time: 14 days • Baseline threshold: 10 • Filter active: Active stock

Sales ready Settings

Out of Stock
4,157
Items with zero stock

Active Stock
743
Active SKUs (recent sales)

Dead Stock
4,248
No sales in last 6 months

Reorder Needed
4,530
Items below reorder point (uses lead time)

Product Inventory
Detailed view of all clothing SKUs

Upload Sales Data Upload Stock Data Upload SKUs Data

Search by name, SKU, brand, color, supplier... All Categories All Sizes

Clear All Filters

Showing 743 of 5,209 SKUs Active filters: Active Stock 743 active items with recent sales

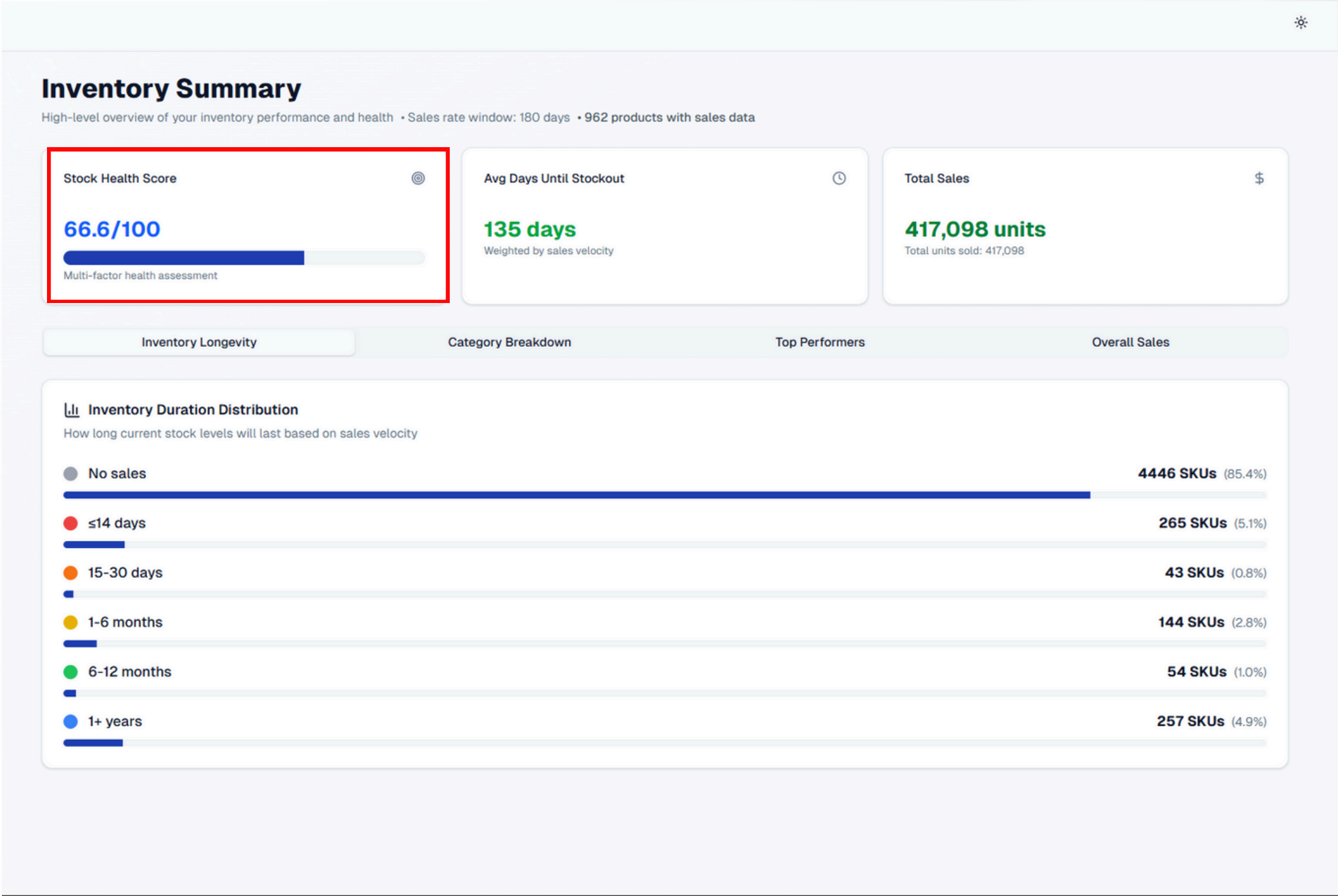
SKU	Product Details	Category	Stock Level	Sales Rate	Days Left	Status
TTF136-M	M	Boxer Short Printed Fabr...	0	0.16 per day	0d	Out
TTF131-M	(A3) ส้มปรี๊ด -Pineapple (ผ้าฝ้าย)(M)	Boxer Short Printed Fabr...	13	0.41 per day	32d	Normal
TTF105-M	(A3) ลาโวกาโดเล่เล็กพื้นเขียวเข้ม (ผ้าฝ้าย) New - avocado(M)	Boxer Short Printed Fabr...	668	1.91 per day	349d	Normal
TTG135-M	(A4) Christmas กวางเรนเดียร์ -reindeer (ผ้าฝ้าย)(M)	Boxer Short Printed Fabr...	1	0.08 per day	12d	Low
TTG140-M	(A4) Christmas ชนมึงชิง(M)	Boxer Short Printed Fabr...	1	0.01 per day	179d	Low
TTG141-M	(A4) Christmas ชนค่านละสโนแมน(M)	Boxer Short Printed Fabr...	0	0.03 per day	0d	Out
TTG108-M	(A4) จักรวาลพื้นฟ้า New - universe(M)	Boxer Short Printed Fabr...	334	1.03 per day	323d	Normal
TTG109-M	(A4) จักรวาลพื้นเทาอ่อน New - universe(M)	Boxer Short Printed Fabr...	356	0.49 per day	728d	Normal
TTG107-M	(A4) จักรวาลพื้นน้ำเงิน New - universe(M)	Boxer Short Printed Fabr...	612	0.87 per day	706d	Normal

- Out - stock = 0
 - Red
- Urgent - days left < 7
 - Red
- Low - stock $\leq$ baseline threshold
 - Amber
- Watch - days left < 30
 - Yellow
- Normal - otherwise
 - Green

METHODOLOGY - IMPLEMENTATION STAGE

CALCULATIONS

Factor	Max Points	Criteria
Stock Coverage	40	Days until stockout: 90+ days = 40pts, 60-89 = 30pts, 30-59 = 20pts, 14-29 = 10pts, <14 = 0pts
Stock Vs Reorder Point	30	Stock $\geq 2\times$ reorder = 30pts, $\geq 1.5\times$ = 20pts, $> 1\times$ = 10pts, $\leq$ reorder = 0pts
Sales Activity	20	Last sale ≤ 7 days = 20pts, ≤ 30 = 15pts, ≤ 60 = 10pts, ≤ 90 = 5pts, > 90 = 0pts
Not Overstocked	10	Days left ≤ 365 = 10pts, ≤ 500 = 5pts, > 500 = 0pts
Total	100	Average across all products



METHODOLOGY - IMPLEMENTATION STAGE

CALCULATIONS

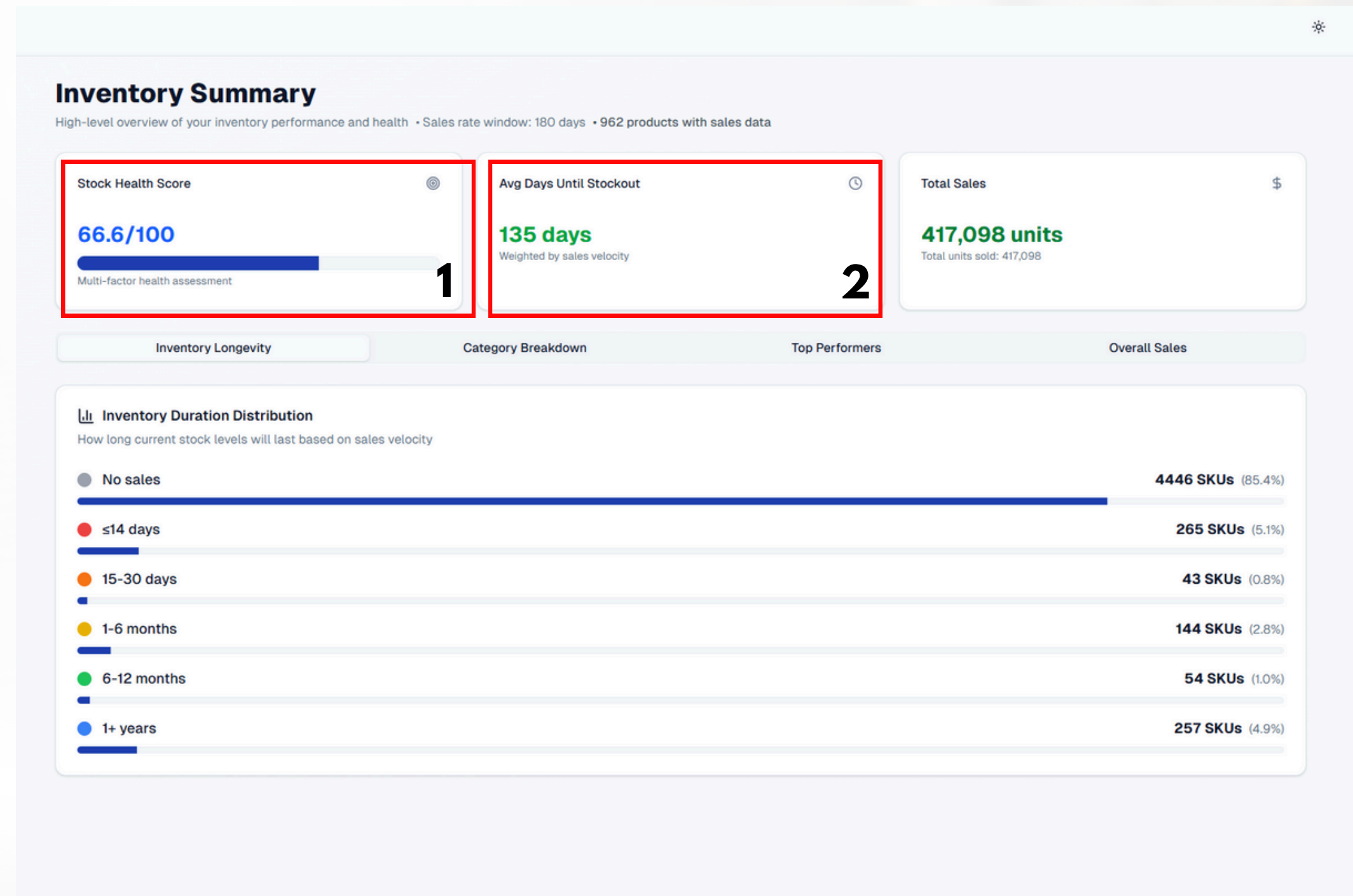
1. Color Coding:

- 80–100: ● Green (Excellent health)
- 60–79: ● Blue (Good health)
- 40–59: ● Orange (Moderate health)
- 0–39: ● Red (Poor health)

2. Avg Days till Stockout: Weighted Avg = $\frac{\sum(\text{days_left} \times \text{daily_rate})}{\sum(\text{daily_rate})}$ (skus with higher sales rate have higher weight)

Color Coding:

- < 14 days: ● Red (Critical)
- 14–29 days: ● Orange (Warning)
- ≥ 30 days: ● Green (Healthy)



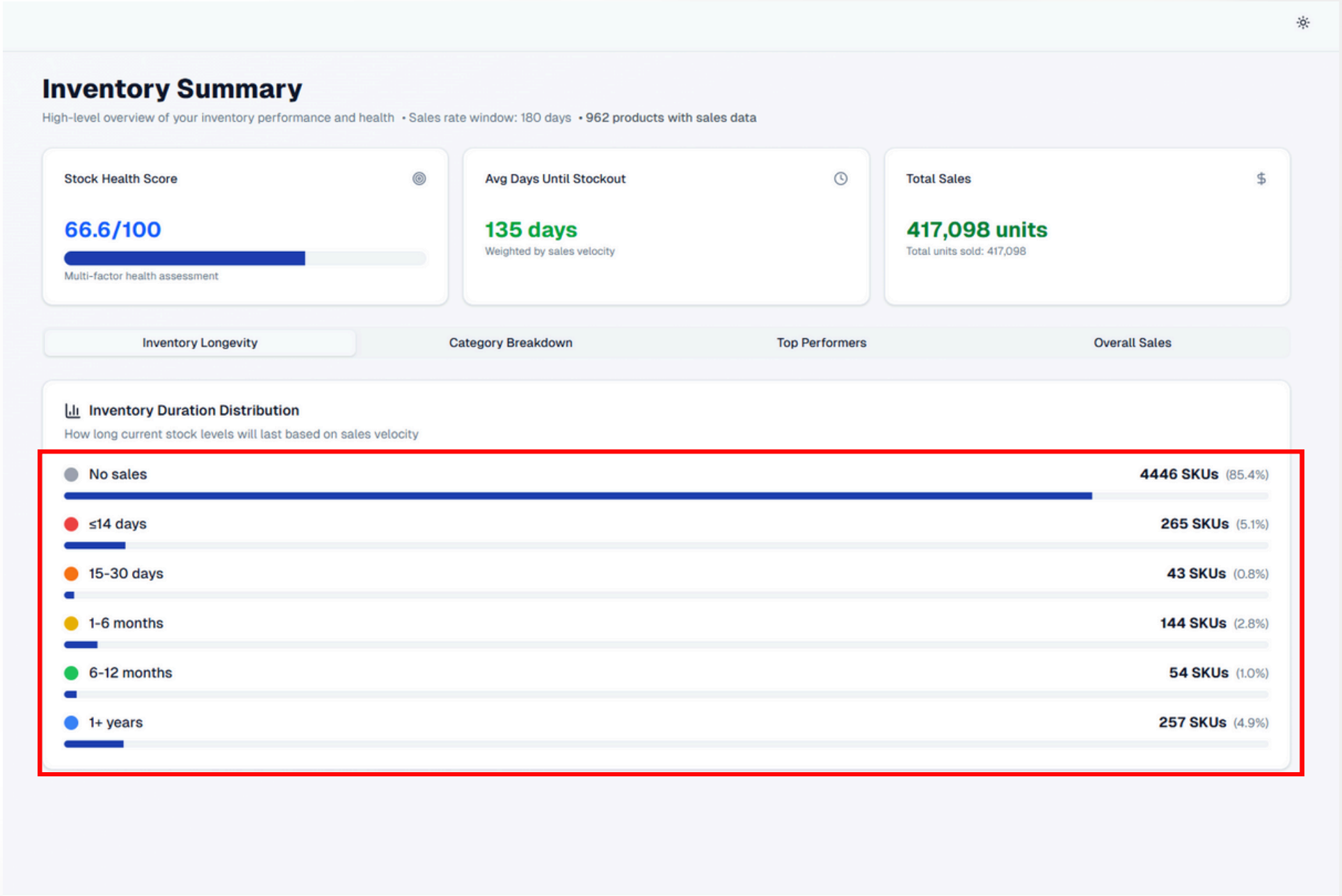
METHODOLOGY - IMPLEMENTATION STAGE

CALCULATIONS

Inventory Duration Distribution Calculations:

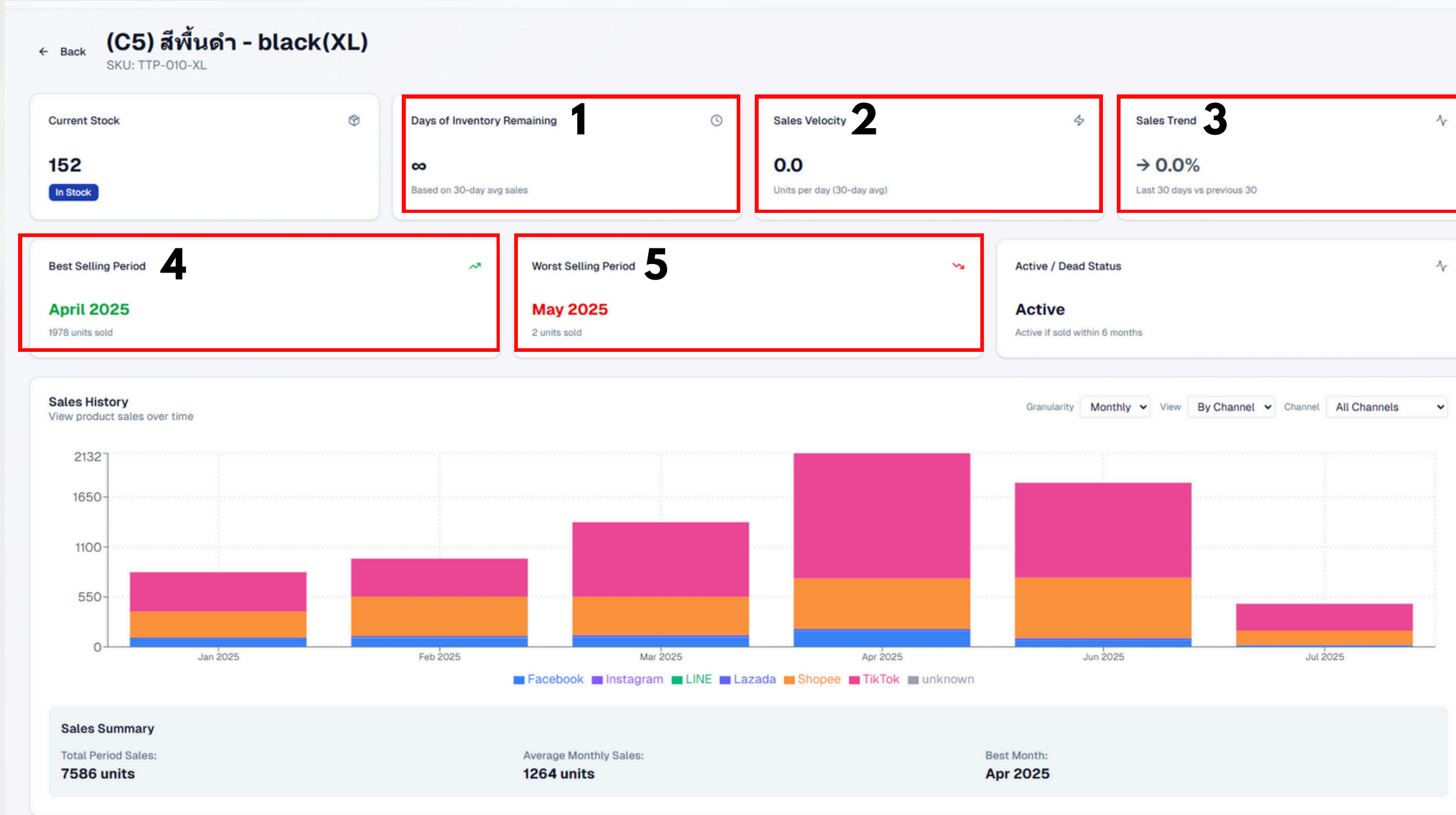
$\text{daysUntilStockout} = \text{stock} / \text{sales rate}$

Category	Condition	Color	Description
No sales	$\text{dailySalesRate} \leq 0$ OR $\text{currentStock} == 0$	Gray	Products with no sales velocity
≤ 14 days	$\text{daysUntilStockout} \leq 14$ OR	Red	Critical – stock will run out in 2 weeks or less
15–30 days	$\text{daysUntilStockout} > 14$ AND ≤ 30	Orange	Warning – stock will run out in 2–4 weeks
1–6 months	$\text{daysUntilStockout} > 30$ AND ≤ 180	Yellow	Moderate – stock will last 1–6 months
6–12 months	$\text{daysUntilStockout} > 180$ AND ≤ 365	Green	Healthy – stock will last 6–12 months
1+ years	$\text{daysUntilStockout} > 365$	Blue	Overstocked – stock will last over a year



METHODOLOGY - IMPLEMENTATION STAGE

CALCULATIONS



1. Days of inventory remaining: $\text{stock} / \text{sales rate of the past 30 days}$. 0 if stock is 0 and ∞ if no sales in the last 30 days

2. Sales Velocity: Avg sales rate for last 30 days

3. Sales Trend: $(\text{last30} - \text{previous30}) / \text{previous30} \times 100$
Direction:

- Up (↑): Trend > 5%
- Down (↓): Trend < -5%
- Stable (→): Between -5% and 5%

4. Best Selling Period: Month with most sales

5. Worst Selling Period: Month with least sales

METHODOLOGY - IMPLEMENTATION STAGE

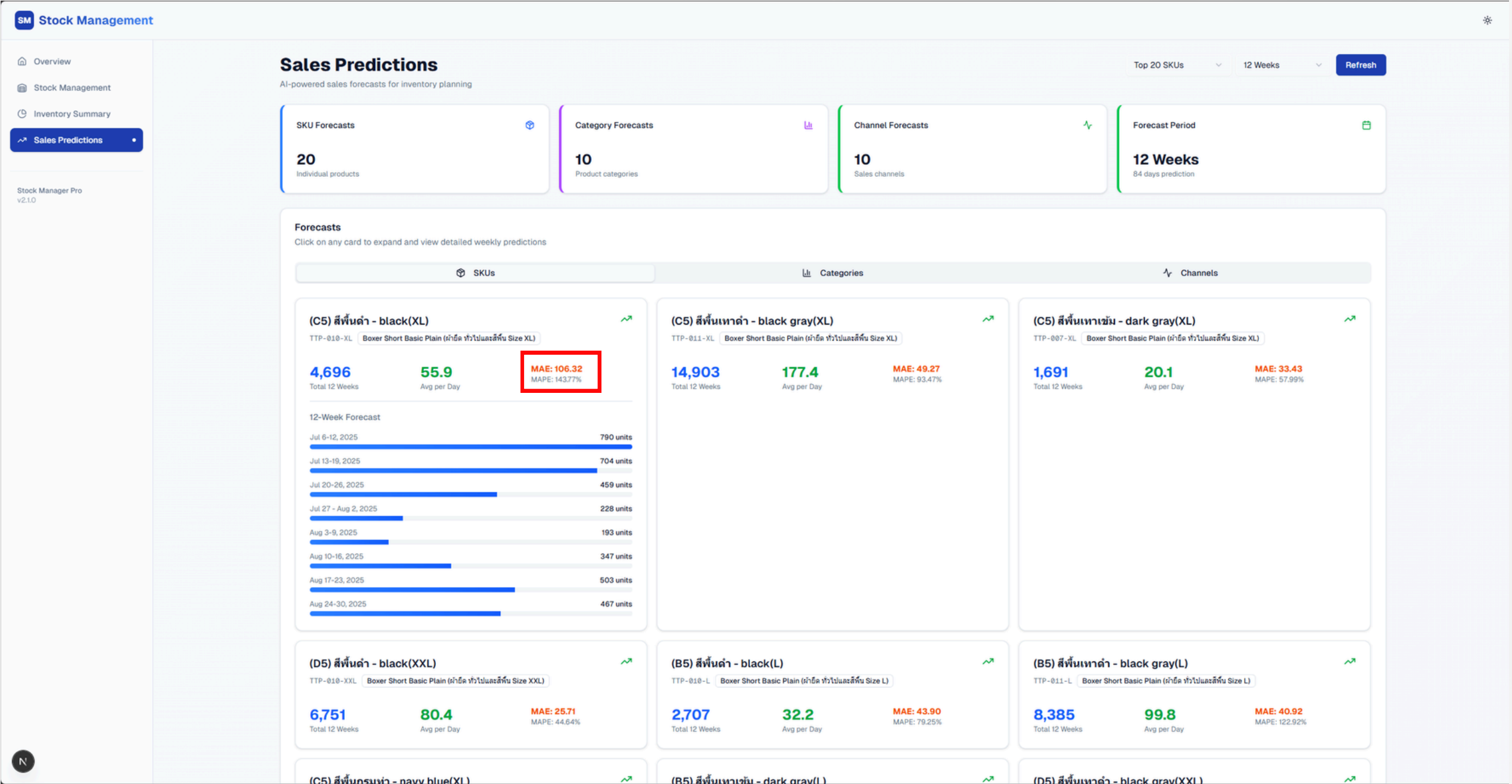
CALCULATIONS

$$MAE = \frac{1}{n} \sum_{i=1}^n |x_i - x|$$

Mean Absolute Error
Xi = Predicted Value
X = Actual Value
n = Number of data points

$$MAPE = \frac{\sum \frac{|A - F|}{A} \times 100}{N}$$

Mean Absolute Percentage Error
F = Predicted Value
A = Actual Value
N = Number of data points



RESULTS

1

Successfully launched
a working application
of the stock
management website

2

Successfully
implemented sales
forecasting into the
application

3

Successfully
implement process to
clean sales and stock
data

DISCUSSION LIMITATIONS

- Experienced problems while packaging the application
- Prediction is not fully accurate and can be further fine-tuned
- Relies the user manually uploading data
- The ETL process is not 100% correct and can lead to some errors in the database

DISCUSSION FUTURE WORK

- Connecting the application directly with the company's system
- Further fine tune the prediction model
- Develop a more robust ETL system
- Explore better ways to package the application

A top-down view of a desk with various items: a laptop in the upper center, a cup of coffee on the left, a pen and glasses in the middle, paper clips on the left, and a large leaf in the bottom left corner. The background is a light, neutral color.

THANK YOU