SUPPLY CHAIN CASE STUDY

GROUP 8

GROUP 8

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OBJECTIVES & OVERVIEW

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AI and Predictive Analysis

OBJECTIVES

Ultimate Comfort Pants Launch in Jan'25

Fulfilling 2025 Customer Demand

Securing RM

OVERVIEW

Cairo Plant

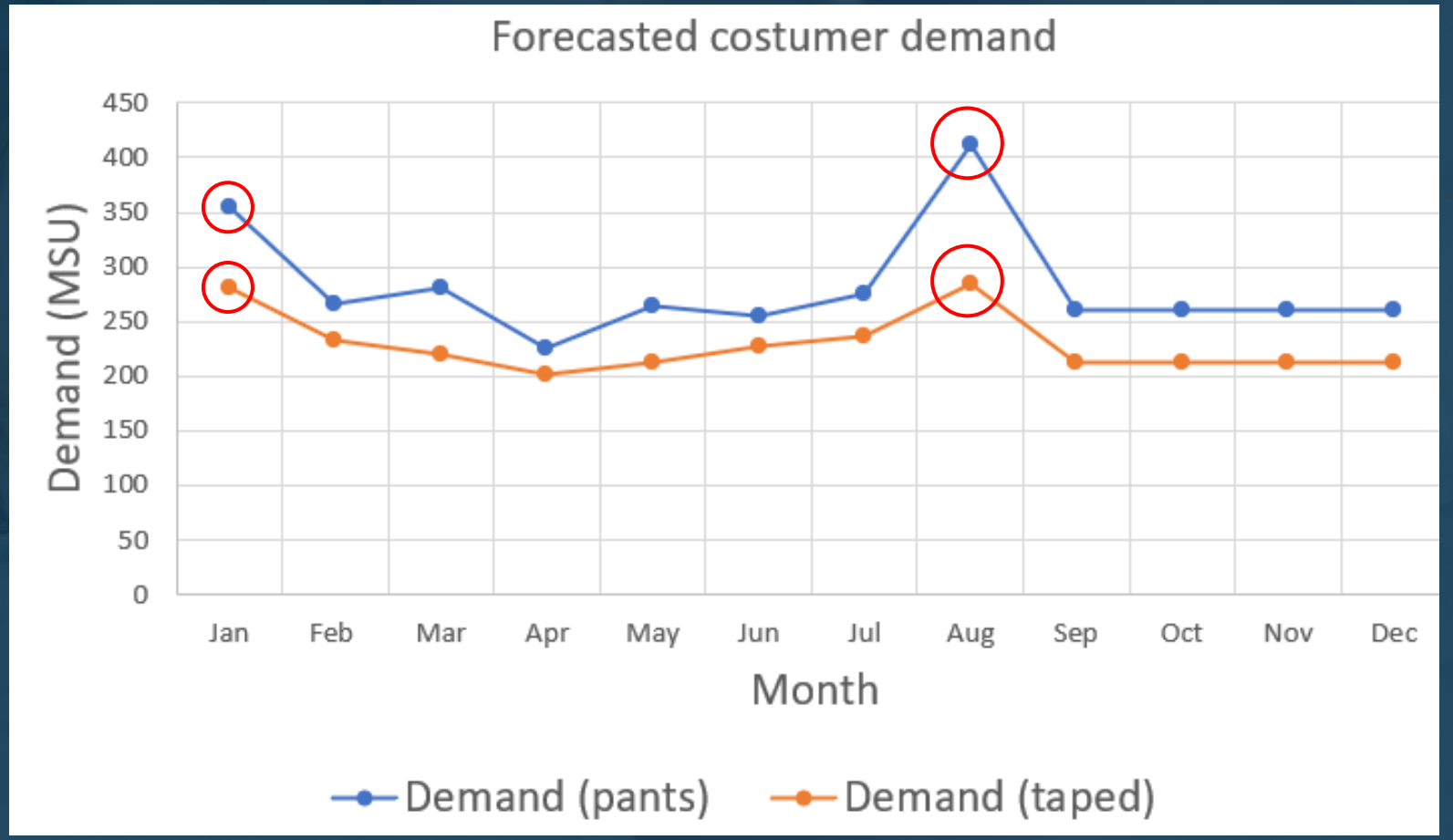
Production Line	Technology	Max MSU/Day	Operating Profile
L1	Pants	7	24/7
L2	Pants	5	24/5
L3	Taped	12	24/5

OVERVIEW

Forecasted Customer Demand (MSU)

		Jan'25 (MSU)		Feb'25 (MSU)		Mar'25 (MSU)		Apr'25 (MSU)		May'25 (MSU)		Jun'25 (MSU)		Jul'25 (MSU)		Aug'25 (MSU)		Sep'25 (MSU)		Oct'25 (MSU)		Nov'25 (MSU)		Dec'25 (MSU)	
Market	Priority	Tech A	Tech B	Tech A	Tech B	Tech A	Tech B	Tech A	Tech B	Tech A	Tech B	Tech A	Tech B	Tech A	Tech B	Tech A	Tech B	Tech A	Tech B	Tech A	Tech B	Tech A	Tech B	Tech A	Tech B
A	1	200	40	170	50	150	52	105	55	137	44	110	30	88	32	124	36	130	52	130	52	130	52	130	52
B	2	95	130	65	85	92	68	97	72	78	58	70	80	90	80	135	110	92	60	92	60	92	60	92	60
C	3	35	40	15	32	22	34	24	36	20	29	21	31	40	33	76	37	22	34	22	34	22	34	22	34
D	4	25	30	16	30	17	30	0	0	30	50	54	53	57	56	76	62	17	30	17	30	17	30	17	30
E	5	0	40	0	35	0	36	0	38	0	31	0	33	0	35	0	39	0	36	0	36	0	36	0	36
Total Monthly MSU		355	280	266	232	281	220	226	201	265	212	255	227	275	236	411	284	261	212	261	212	261	212	261	212

OVERVIEW


Forecasted costumer demand
Demand (MSU)
450
400
350
300
250
200
150
100
50
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Month
Demand (pants)
Demand (taped)

Problem Statement

Problem 1

Raw Material shipment delay:

13 Jan — Original shipment arrival date in Cairo plant

↓

25 Jan — Delayed shipment arrival date at Cairo plant

Production gap →

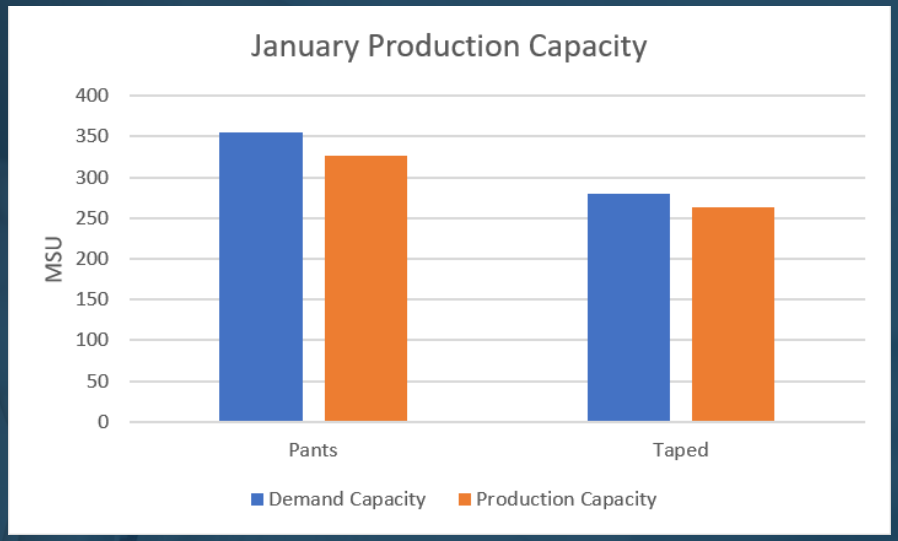
98 MSU Pants
74 MSU Taped

Problem Statement

Problem 2

January: Costumer demand exceeds max production capacity:

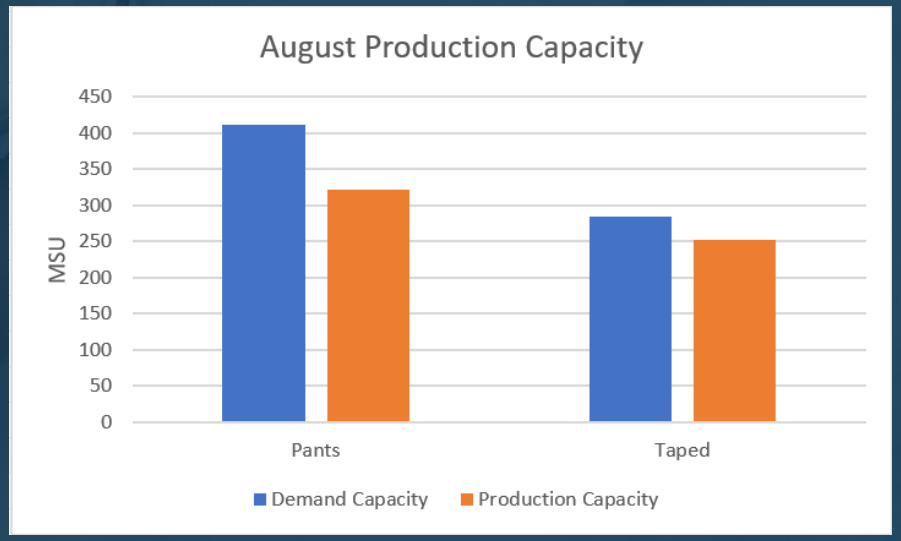
- Pants: 28 MSU
- Taped: 16 MSU



Problem 3

August: Costumer demand exceeds max production capacity:

- Pants: 89 MSU
- Taped: 32 MSU



PLAN & SOLUTIONS

Possible Solutions

For problem 1

- Prioritize high priority markets
- Supply some markets from different plants
- Change shipment method
- Find other suppliers/ spot markets
- Get RM from recycling

PLAN & SOLUTIONS: problem 1

Until 23 Jan → Production → 276 Pants (MSU) 209 Taped (MSU) → RM to produce → 73,500 kg

In Plant: 47,500 kg
Needed: 26,000 kg

Solution

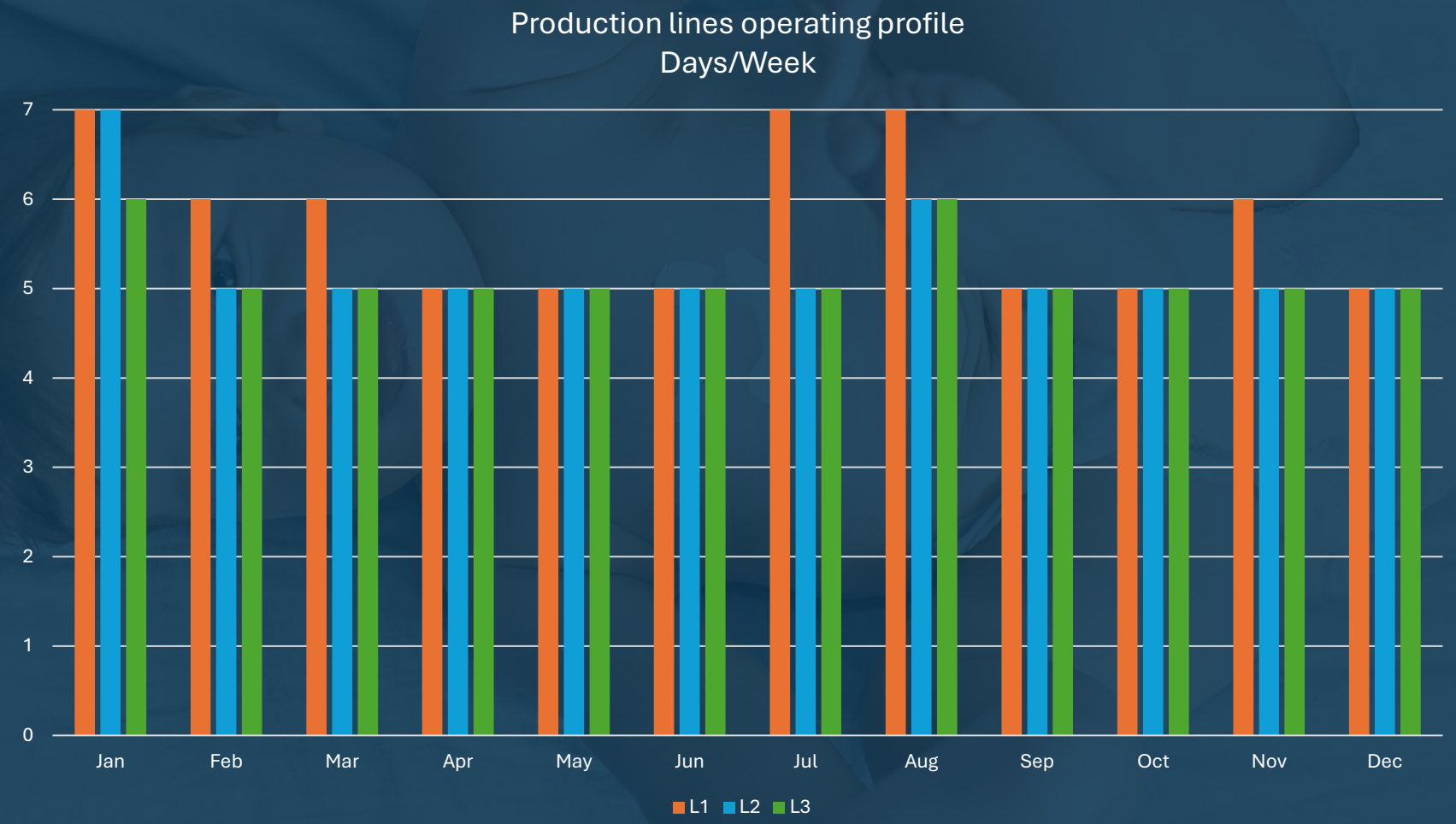
Air Freight

RM Flow

29 Dec	47,500 kg	In Stock
7 Jan	26,000 kg	Air Freight
23 Jan	20,000 kg	Sea Freight
25 Jan	20,000 kg	Delayed Shipment

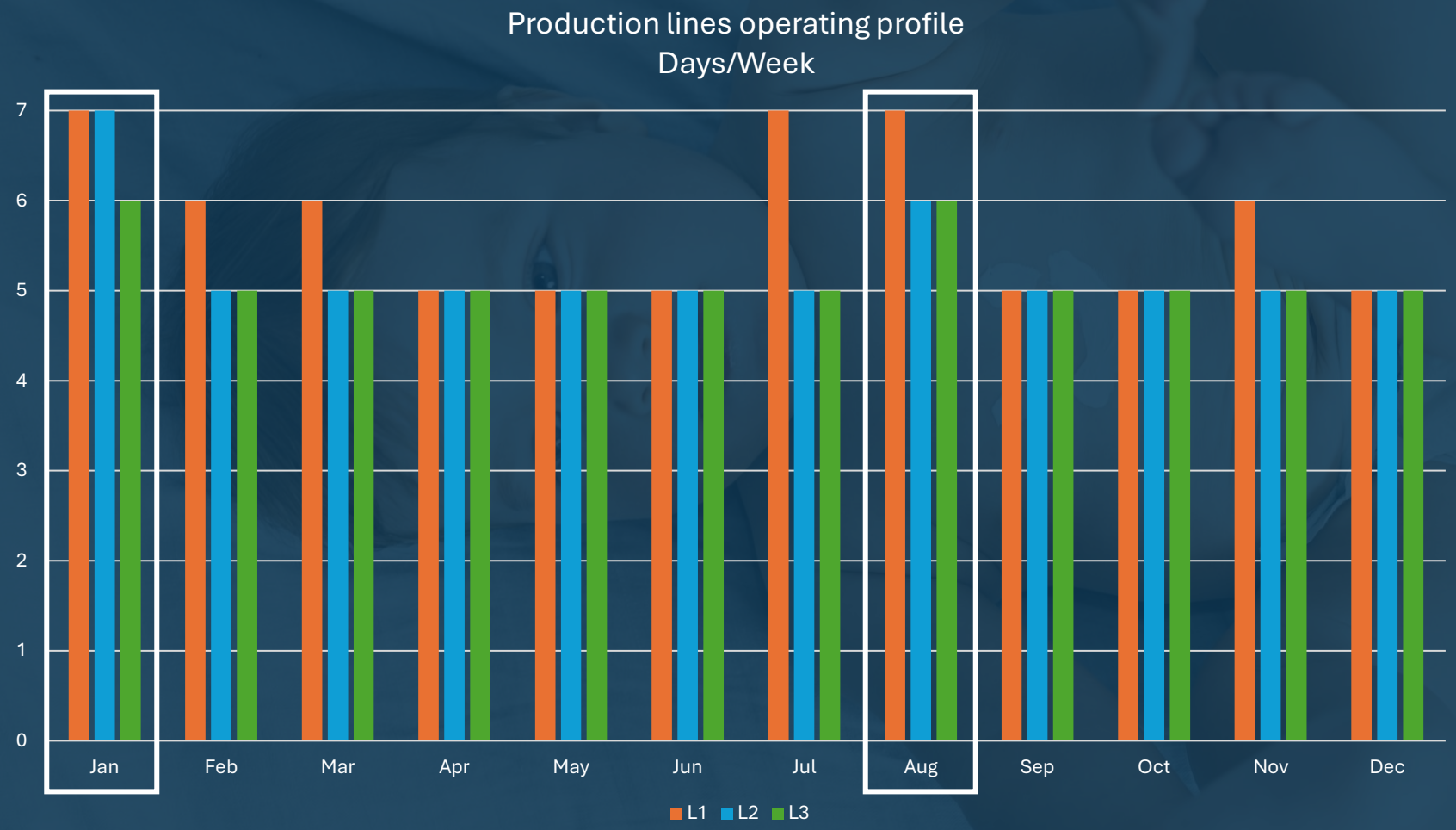
PLAN & SOLUTIONS: problem 2/3

OPERATING PROFILE



PLAN & SOLUTIONS: problem 2/3

OPERATING PROFILE



Adjusting operating profile in Jan & Aug due to high demand

PLAN & SOLUTIONS: problem 2

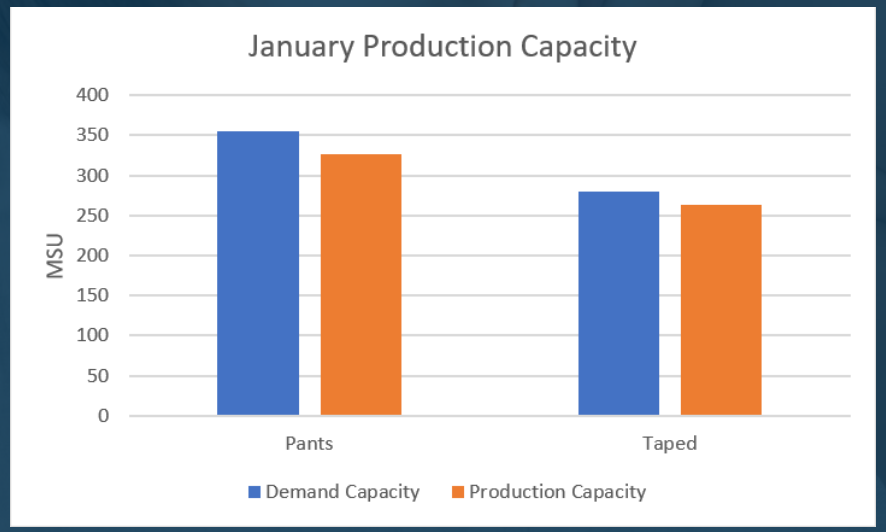
Total RM required= 96550 kg

Before adjustment of operating profile:

- **Total consumed RM** = 90030 kg

After adjustment of operating profile:

- **Total consumed RM**= 101820 kg



L1 (January)

Operating Profile: 24/7

Consumed RM: 28,210 kg

L2

Operating Profile: 24/7

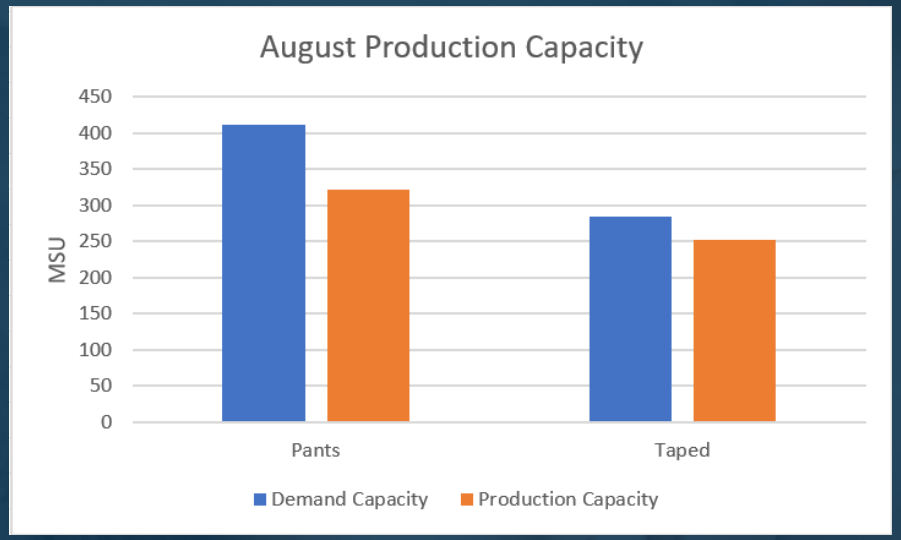
Consumed RM: 20,150 kg

L3

Operating Profile: 24/6

Consumed RM: 53,460 kg

PLAN & SOLUTIONS: problem 3



Total RM required= 104,550 kg

Before adjustment of operating profile:

- Total consumed RM= 87,220 kg

After adjustment of operating profile:

- Total consumed RM= 96,590 kg

L1 (August)

Operating Profile: 24/7

Consumed RM: 28,210 kg

L2

Operating Profile: 24/7

Consumed RM: 16,900 kg

L3

Operating Profile: 24/6

Consumed RM: 51,480 kg

Increase production in July to start the month of August with:

- 14% of the customer demand for pants
- 10% of the customer demand for taped

SAFETY STOCK

Average monthly safety stock: 8%

Reason:

1. Have finished product by beginning of month
2. Aid in months where demand is high
3. Account for Egyptian national holidays in 2025:

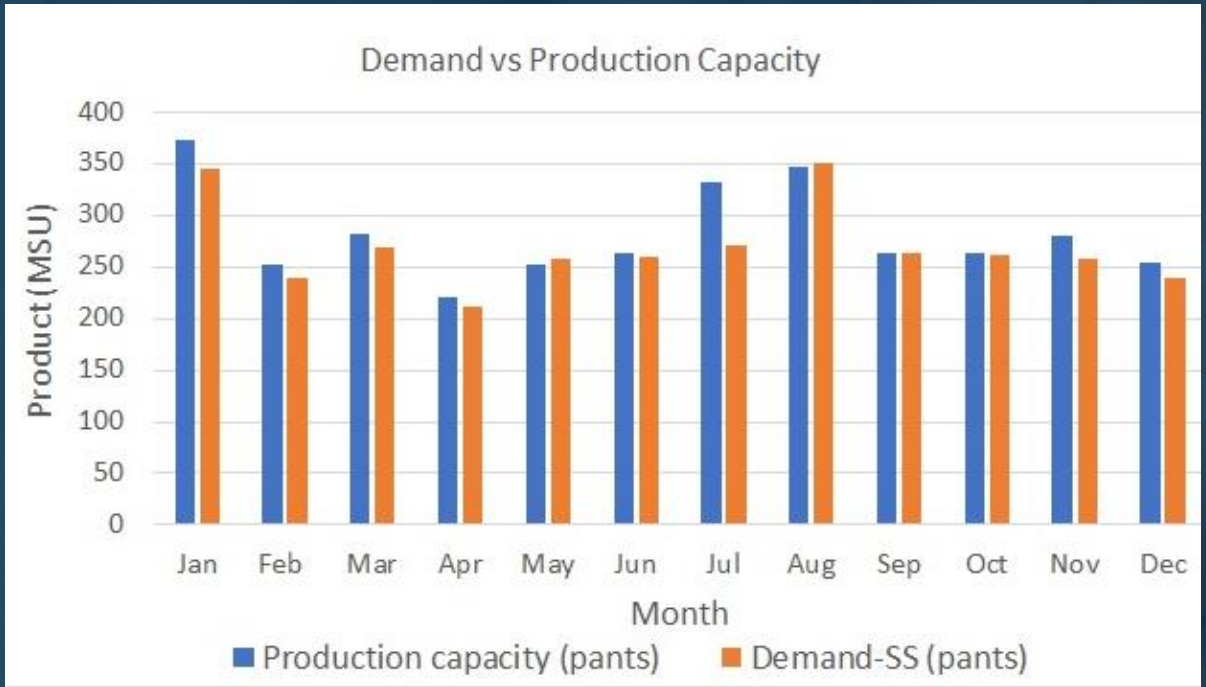
L1 = 7*21= 147 MSU (pants)

L2 = 5*21= 105 MSU (pants)

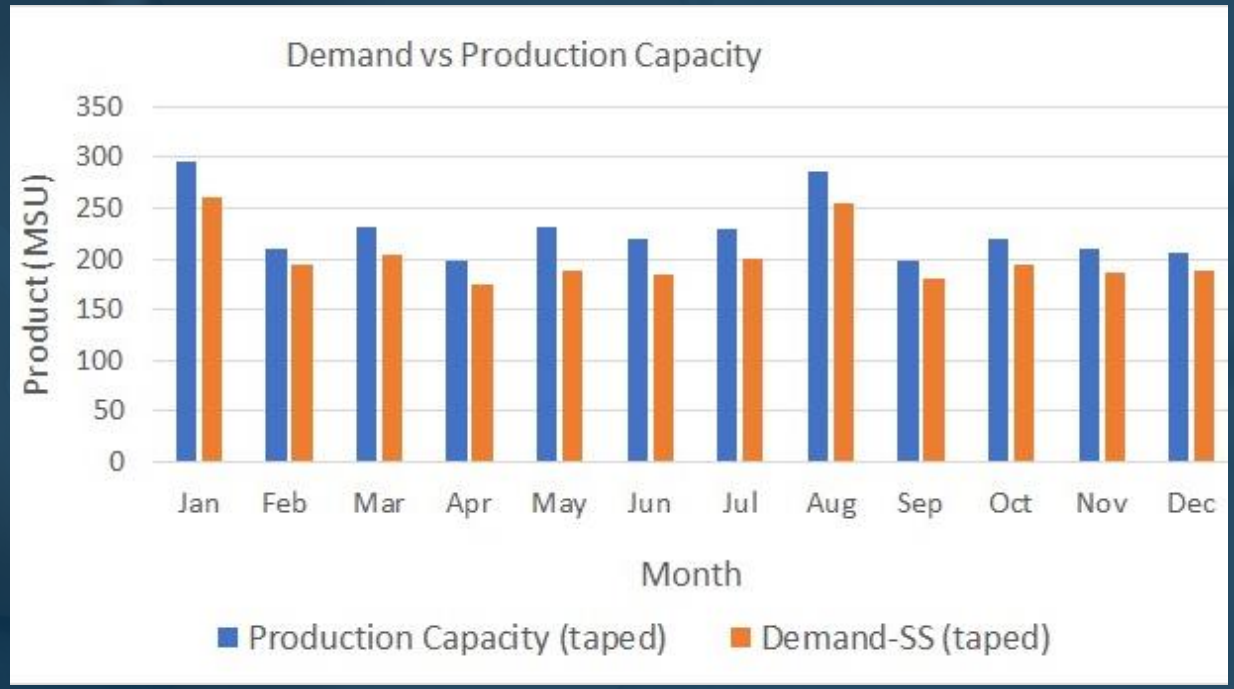
L3 = 12*2 = 252 MSU (taped)

Customer Demand vs Design Capacity

Pants



Taped



- Customer demand is fulfilled for the pants and taped throughout the entire year of 2025

FORECASTED RAW MATERIAL

Month	January	February	March	April	May	June	July	August	September	October	November	December
RM (kg)	101,820	70,560	79,540	64,240	74,340	73,920	84,560	96,590	69,960	73,920	74,200	70,150

STRATEGIC ACTIONS

- Diversify Suppliers
- Maintain Safety Stock Levels
- Risk assessments for scenarios like shipment delays or political issues
- AI for prediction and optimization

AI and Machine Learning Strategies

Predictive Modeling for Risk Management

- Leverages ML to forecast supply chain disruptions by analyzing risk factors.

Key Data Sources:

- Shipping patterns & port data
- Supplier lead times & customs
- Economic & geopolitical indicators

Cross-Functional Collaboration:

- Teams Involved: Supply Chain, MSM, IT
- Actions: Refine the model & Real-time alerts for proactive risk mitigation

Inventory Optimization Models

- Optimizes reorder points and inventory levels based on forecasted demand & lead times.

Key Data Sources:

- Supplier lead times & customs data
- Market trends & economic indicators
- Historical sales & demand forecasts

Cross-Functional Collaboration:

- Teams Involved: Sales, Supply Chain, IT
- Actions: Continuous feedback loop to adjust forecasting models

AI and Machine Learning Strategies

Scenario Planning [Prospective]

- Creates and evaluates “what-if” scenarios to proactively prepare for potential supply chain disruptions, ensuring resilience across a range of future conditions.

Data Sources:

- Historical shipping data & port traffic
- Supplier lead times & customs
- Market trends, economic indicators, and sales forecasts

Cross-Functional Collaboration:

- Teams Involved: Supply Chain, MSM, IT, Leaders
- Actions: Train the model using updated scenarios and contingency plans & Simulate scenarios for readiness in diverse future conditions

Thank you

Questions ?