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For tile-adhesives, a balance between price & availability needs to be ensured through efficient yet responsive supply chain.

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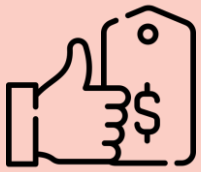
Business Goals

- As the product is newly launched by Asian Paints it is still in growth phase
- Business goal should be to **gain market** share and come at par with market leader



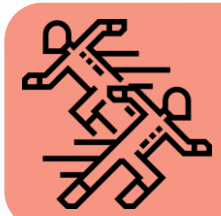
- Adhesives are functional products in a price competitive market
- Business goal should be to maintain a **competitive price** linked to market

- As the product is economical in highly competitive space, customer will be indifferent to the ‘Asian Paints’ brand
- Business goal should be to maintain **product availability** all time in the market

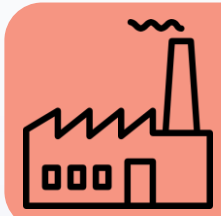
Derived Supply Chain Goals

Increasing market penetration by increasing number of dealers and distributors

Efficient supply chain aimed at minimizing inventory holding and transportation cost



Develop responsiveness in supply chain but not at expense of cost



Setting manufacturing locations closer to market and supplier locations

While D2Cons model fits perfectly for supplying to construction sites, trade-offs will have to be balanced for retail markets.

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	Depot and dealer model	Distributor Model	Directly to Construction Site
		Tradeoff ⇄ **Tradeoff**	**Strategic fit**
Benefits	- Less touchpoint, higher margins - Higher control on supply chain - Flexible & easier customization	- Efficient due to high MOQs - Low inventory & transportation cost - Higher market penetration	- Short transportation time - Can be used to aggregate supplies - Simplistic operation & coordination
Drawbacks	- Requires precise forecast - High inventory & transportation cost - Lower market penetration	- Distributor margin, low profitability - Product customization is difficult - Less demand responsiveness	- Demands high service levels - Requires large order size
	! Responsive distribution channel but cost inefficient	! Efficient but not responsive to demand fluctuation	✓ **Best suited** for transporting adhesives to **construct sites**

Adhesive Industry: Supply Side Uncertainties

Supply Source Capabilities	Supply Uncertainty is…
Frequent breakdowns in Supply	Low
Production process changes	Low
Supply Capacity constraints	Low
Inflexibility of Supply capacity	High
Unpredictability of Yields	High

Adhesive Industry: Demand Side Uncertainties

Customer Needs	Demand Uncertainty is…
Rate of innovation	Low
Range of SKUs	Low
Required service levels	Low
Lead time	Moderate
Range of quantity required	High

Given its lower supply chain costs, distributor model should be used for tile-adhesives, while D&D model is suited for paints - which demand high flexibility.

Supply Chain Cost Equation

Constant for all distribution networks

$$SC\ cost = Production\ cos + Primary\ freight\ cost + Tertiary\ freight\ cost + Holding\ cost$$

Varies with distribution network

- Inventory Holding Costs and Tertiary Freight Costs contribute significantly to overall product cost.
- Hence choosing a Supply Chain network which is low in both of these is important for bulkier products like Tile Adhesives.

Comparing two Supply Chains wrt. to these costs

Distribution channels	Depot & dealer model	Distributor model
Inventory holding cost	High	Low
Tertiary freight cost	High	Low

Product – Process Fit

Process	Process->	Dealer & Depot Model	Distributor Model
	Functional Product	✗	✓
	Requires Lean Supply Chain	✗	✓
	Requires Low-cost Supply C.	✗	✓

As Tile Adhesive is a functional product, we need low cost (lean) supply chain

A comparative study of paint and adhesive business strategies:

Strategies	Paint business strategy Responsive Supply Chain	Adhesive business strategy Efficient yet responsive Supply Chain
Business strategy	Quick response to demand	Supply demand at low cost
Pricing strategy	Value based	Market linked
Manufacturing strategy	Make to spec, delay customization	Make to stock, low cost, high utilization
Inventory strategy	Low FG inventory stock	Optimum FG inventory stock
Lead time strategy	Reduce even at high cost	Reduce but maintain low cost
Supplier strategy	Based on flexibility & reliability	Select based on cost efficiency & reliability
	Predominantly use depot & dealer model	*Predominantly use distribution model*

A hybrid model, with a dominant distribution model & D&D components, is better suited to achieve efficiency yet responsiveness.

One size fit distribution channel cannot be applied to all.
Hence, we recommended using a hybrid distribution channel:
Direct to site: Use for large constructional projects with high MOQs
Distributor model: Use as a dominant distribution channel for small & medium dealers and for market penetration through small sellers
Depot & dealer model: Use for large dealers and absorbing demand shocks

We divide dealers in 3 segments based on annual demand:

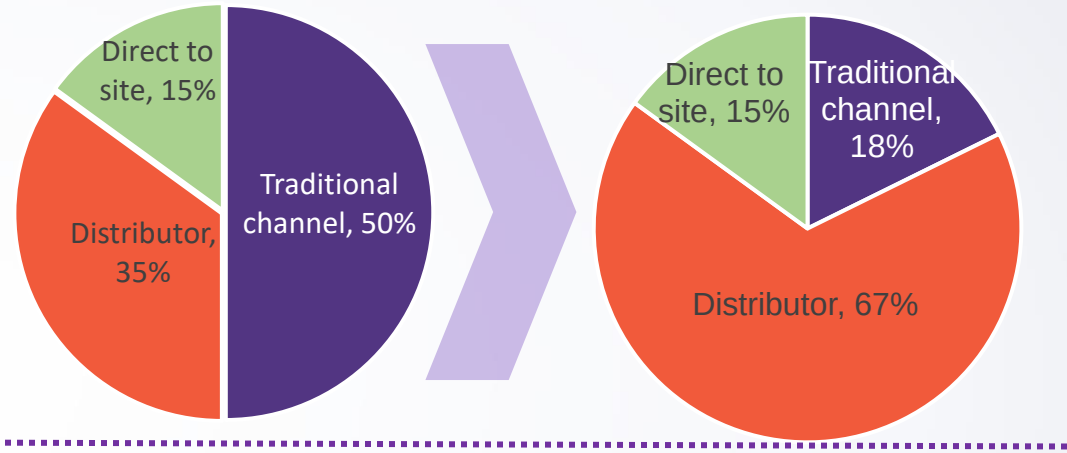
Microsoft Excel Worksheet

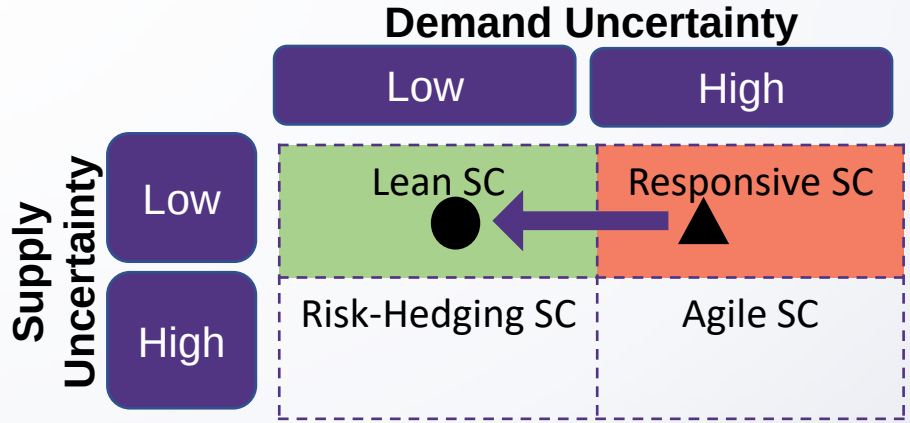
	Large dealers	Mid sized dealers	Small dealers
Annual demand (Kg)	>500	200-500	<200
% of dealers in each category	11.51%	79.2%	9.34%
Total number of dealers	8K	55.5K	6.5K
Percentage categoric demand	**18%**	82%	4%
Total categoric demand (Kg)	63	280	13.5

Depot & dealer model | Distributor model

Assumptions:
1. Annual demand at dealer level follows a normal dealers with μ = 357 Kg and σ = 119 Kg.
2. Total number of dealers in India = 70000

Current distribution split → Recommended distribution split





▲ Current supply chain
● Ideal supply chain in long run

In long run, demand uncertainty will decrease. Hence lean SC should be ultimate aim.

Four mfg. plants - each in the North, South, East, West, with the given fulfilment schedule, should be operated for min. variable costs (1/2).

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1

Raw Material Availability	Demand: High	Demand: Low
High	North (33% sales), East (18% sales), South (25%) — Build new site	NA
Low	West (24% sales) — Collaborate with other plants	Central — Ignore

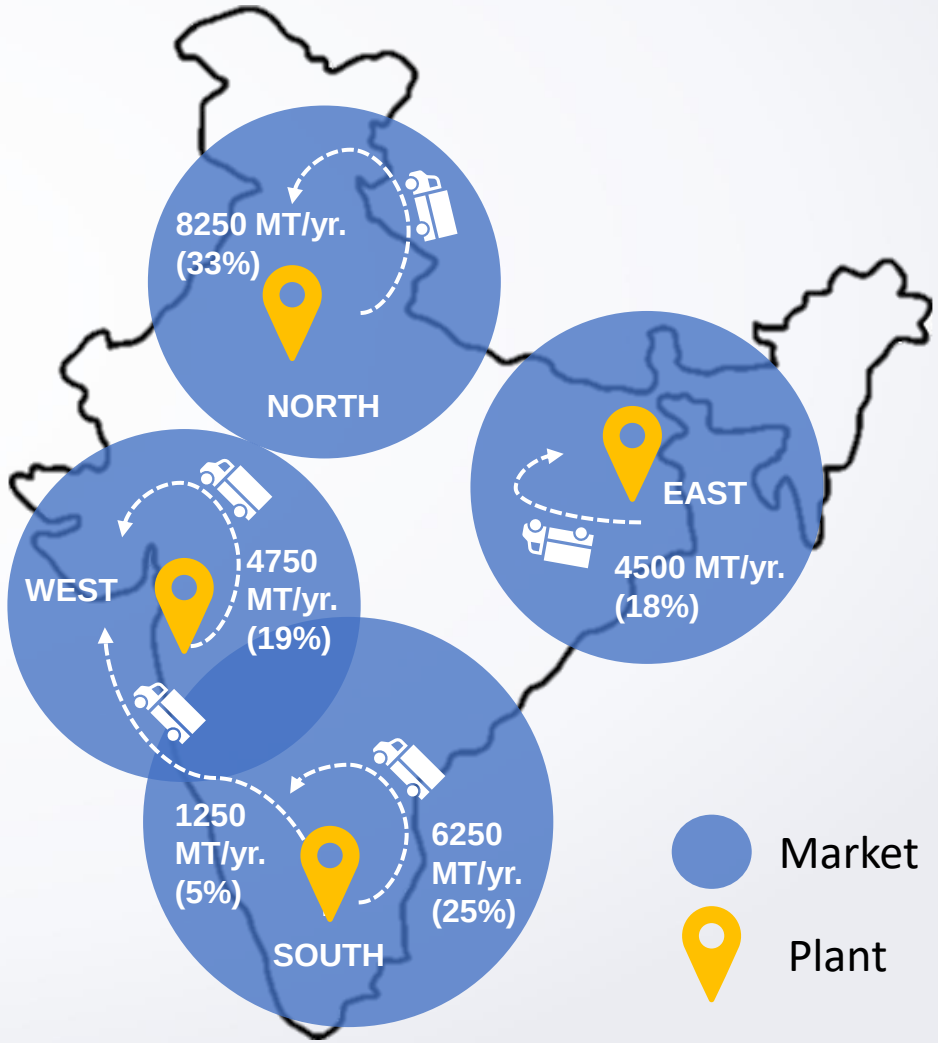
Further comparing the region-wise % cement production (since major required raw material) with given region-wise sales data:

2

Region	% Demand	% Supply	
North	33%	22%	Potential deficit
South	25%	33%	Potential surplus
East	18%	19%	Demand = Supply
West	24%	13%	Potential deficit
Central	-	13%	

Assumptions: Ignoring fixed plant set up costs since they will get offset in the long run.
Plant capacities are proportional to cement production of the region. (*IBEF data*)

Using framework (1) , data (2) and minimizing variable costs by minimizing distances, we arrive at the following network:



Four mfg. plants - each in the North, South, East, West, with the given fulfilment schedule, should be operated for min. variable costs (2/2).

Note: Exact location choice within a suggested region must be supplemented by considering political, social, environmental, tech/infra factors too.

Product-to-Market Plan

From \ To	North	West	East	South
North	8171	0	0	0
West	0	4560	0	0
East	50	0	4700	0
South	28	1440	0	6762

Constraint: Demand of each region should be met completely.
Goal: Minimize the 'supply-capacity' mismatch for each plant, cumulatively.
Objective: Minimize the total variable cost incurred, i.e., minimize the distance that needs to be covered.
Assumption: Fixed cost is not important here since it will get offset in the long term.

Mathematical Formulation

D_{ij}: Distance from plant i to market j

M_j: Sales (demand) of market j

C_i: Capacity of plant i

Microsoft Excel Worksheet

Decision Variable

X_{ij}: Amount of tile adhesives supplied from plant i to market j

Constraints

$$For\ each\ market\ j, \sum_{for\ all\ plants\ i} X_{ij} \geq M_j$$

Goal

$$Keep\ as\ low\ as\ possible: \sum_{for\ all\ plants\ i} |C_i - \sum_{j} X_{ij}|$$

Objective

$$Minimize: \sum_{for\ all\ i,j} D_{ij}.X_{ij}\ taking\ care\ of\ the\ goal\ and\ X_{ij} \geq 0$$

Due to lack of data in the short-term, sales should be qualitatively forecasted using market intelligence and firm's mktg. strategy.

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Forecasting Strategy

Objective:

To forecast the demand in the market to enable an effective production and logistics plan.

Integrated Demand Planning:

Linking forecast to all activities of supply chain:

- Capacity Planning
- Production Planning
- Purchase Planning
- Promotion Planning
- Inventory Planning
- Distribution Planning

Factors Influencing Forecast:

Linking forecast to all activities of supply chain:

- Historical Demand
- Lead Time
- Promotional Efforts
- State of economy
- Competitor Actions
- New product introduction

Level of Forecast:

- In short term, AP should focus on aggregate level forecast and will largely depend on marketing strategy employed.
- In long term, will be having enough demand data and will be able to move from pull strategy to push strategy.

Forecasting Methodology

Forecasting Methods to be used:

- Tile Adhesive is a new product and AP does not have enough historical data; it should **not opt for Time Series** forecasting.
- In short term **Qualitative Forecasting method**, using market intelligence should be used to determine the aggregate demand
- With available historical data combined with Marketing efforts, **Simulation forecasting methods** should be used to imitate the consumer choices that give rise to demand

Demand Forecast Plan

	2021	2022	2023
Market Size ($ Mn)	115	125	136
Sales Volume (mT)	343830	374775	408505
Target Market Share	7.3%	8.73%	10.47%
Estimated Annual Demand (mT)	25000	32700	42772

Why this strategy will work:

- Pull distribution will reduce the unpredictability and risk associated while serving demand
- In long term time series forecasting will provide more granular data enabling push strategy

Since tile grout requires responsive yet wide market presence, distributors should be serviced through depot model.

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Supply characteristics

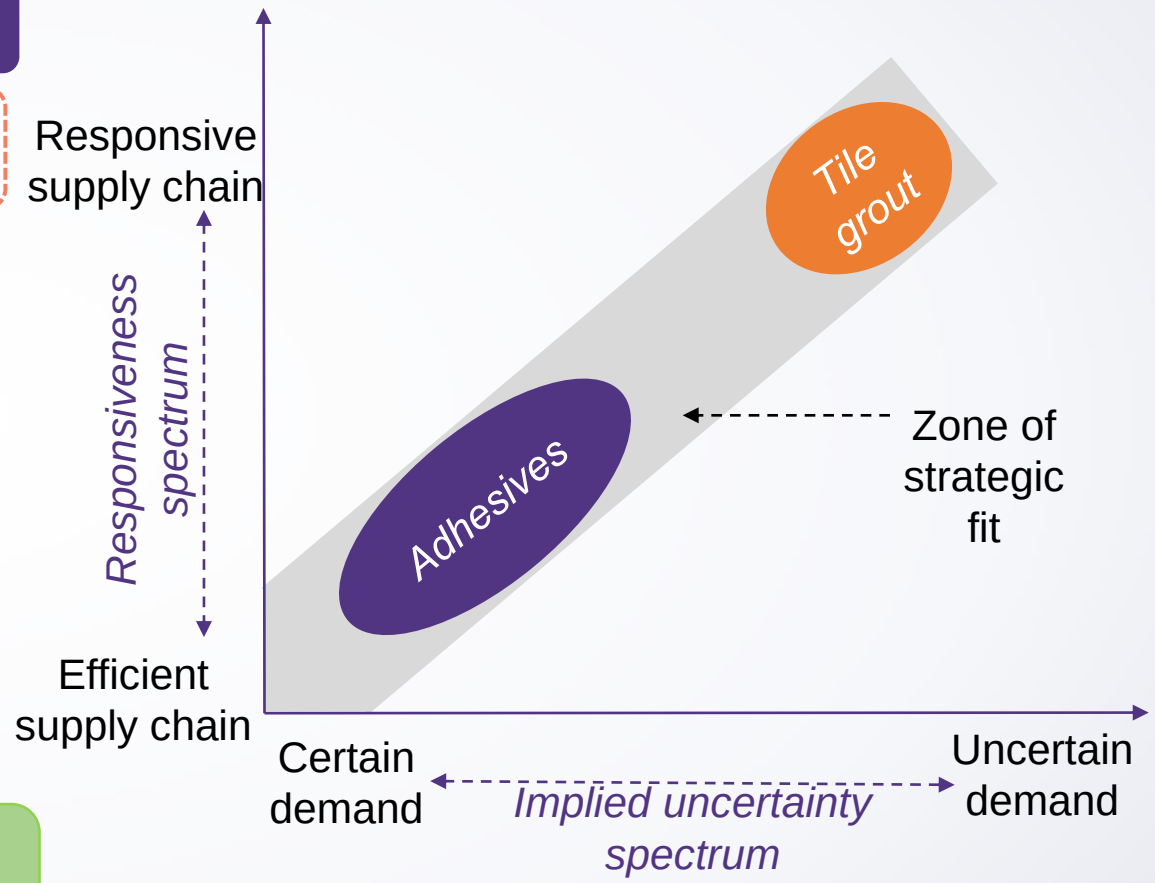
Few manufacturing locations
Several upcoming product shades

Demand characteristic

Low volumetric demand per SKU
Large product variety (42 SKUs)

High implied demand & supply uncertainty

Product Characteristics	Implications
Non Commoditised Product	Higher margins available
Non Bulky Product	Low Transportation and Inventory costs
Complementory Product to Tile Adhevsive	Tile Grout and Tile Adhesive should be available at same counter



Recommended Supply Chain

- Responsive Supply Chain – For high Supply Demand Uncertainty
- Uncertainty can be reduced by observing Made to Order strategy
- Responsive Supply chain is aided by higher product margins and low logistics costs
- Complementariness of Tile Grout necessitates presence at all counter where Tile Adhesive is sold

- Thus following current model of servicing distributor through depots is the suitable for the product line.

Summarizing the recommendations…

	What?	How?	Why?
1	Servicing to contruction site	Use Direct to Site model	Best supply chain providing startegic fit
2	Servicing to small & medium dealers	Use of Distributor Model	Cost Efficient Supply Chain
3	Servicing to large dealers	Use of Depot - Dealer Model	High MOQs reduces the freight costs yet remain reponsive with margins
4	Servicing demand spikes	Use of Depot - Dealer Model	Responsive Supply Chain
5	Lean Supply Chain	Use of Hybrid Model	In Long Term Asian Paints will gain: - More counters onboard - Brand Recognition - Past Demand Data
6	Inventory of Distributors	Maintain high inventory level Sign a service contract	High invetory for unpredictable demand Service contracts for risk hedging
7	Servicing Tile Grouts	Distributors through depots	Responsive Supply Chain Low logistic costs for lighter product
8	Demand Forecasting	Qualitative & Simulation based in Short Term	Pull based strategy and aggregate level planning will be best give the situtation
9	Marketing Strategy	Short Term - Pull Strategy Long Term - Push Strategy	Low predictability hence higher costs Use of demand data for precise predictions

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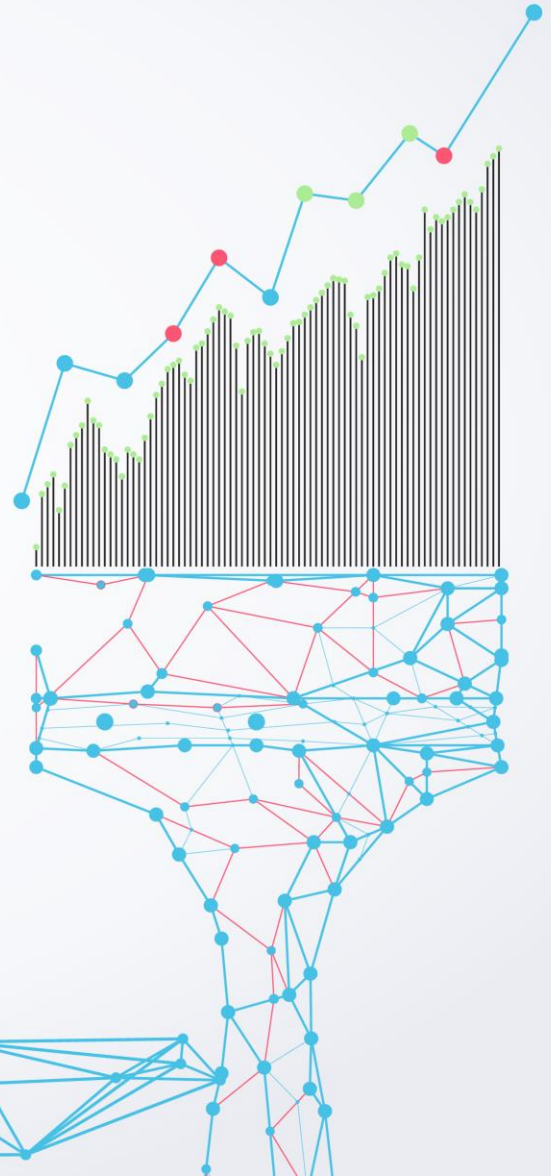
IGNITING INNOVATION



THANK YOU

Q&A with the Jury