Warehouse model & distribution network

Beauty products manufacturer and retailer

- Explored various potential sites and timelines for warehouse operations, considering projected optimal transit times over the next decade
- Created a dynamic model to assess warehouse utilization across multiple scenarios, factoring in orders' growth projections and available manpower

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Beauty products manufacturer and retailer needs warehouse model & distribution network

Picture this…

You're looking to design a model to assess warehouse utilization across multiple scenarios, factoring in orders' growth projections and capacity constraints. Currently, you are establishing new warehouses to accommodate the growing demand from online channel and sought to optimize warehouse locations by considering factors such as transit time, shipping costs, and capacity constraints. Also, you are evaluating the feasibility of fulfilling online orders for certain products from offline stores instead of shipping from warehouses.

You turn to Accordion.

We partner with your team to explore various potential sites and timelines for warehouse operations, considering projected optimal transit times over the next decade. Creating a dynamic model to assess warehouse utilization across multiple scenarios, including:

- Evaluating multiple scenarios based on the potential locations provided and recommended number of warehouses, their locations, and operational timeline while considering the optimal projected transit time for the next 10 years
- Examining the distribution of orders among warehouses on a monthly basis for different scenarios, aiming to identify seasonal impacts and assess feasibility of demand fulfillment considering capacity constraints
- Developing a dynamic model to redistribute a specific category of online orders to offline retail stores based on their nearest ZIP code locations, aiming to assess the cost and capacity impact of shifting these orders from warehouses to offline stores
- Enabling users to input growth projections, manpower availability, warehouse operational months, and other variables to simulate optimal scenarios

Your value is enhanced.

You have shared the insights into the warehouse capacity utilization by months through simulating business implications of various parameters such as manpower, orders' growth, operational cost, etc., facilitating strategic decisions regarding the timing and location of new warehouses. You have also done comprehensive visibility regarding an opportunity to extend the demand fulfillment from existing warehouses for additional 2 years by redistributing certain categories of online orders from warehouses to offline stores.

WAREHOUSE MODEL & DISTRIBUTION NETWORK

KEY RESULT

Fulfillment from existing warehouses for additional 2 years

VALUE LEVERS PULLED

- Warehouse Optimization
- Orders Distribution
- Optimal Transit Time Analysis

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Warehouse optimization model for online orders for a beauty products company

Situation

- Client aimed to establish new warehouses to accommodate the growing demand from online channel and sought to optimize warehouse locations by considering factors such as transit time, shipping costs, and capacity constraints
- Client was also to evaluating the feasibility of fulfilling online orders for certain products from offline stores instead of shipping from warehouses
- Partnered with the client to design a model to assess warehouse utilization across multiple scenarios, factoring in orders' growth projections and capacity constraints

Accordion Value Add

- Evaluated multiple scenarios based on the potential locations provided by the client and recommended number of warehouses, their locations, and operational timeline while considering the optimal projected transit time for the next 10 years
- Examined the distribution of orders among warehouses on a monthly basis for different scenarios, aiming to identify seasonal impacts and assess feasibility of demand fulfillment considering capacity constraints
- Developed a dynamic model to redistribute a specific category of online orders to offline Retail Stores based on their nearest ZIP code locations, aiming to assess the cost and capacity impact of shifting these orders from Warehouses to offline stores
- Enabled users to input growth projections, manpower availability, warehouse operational months, and other variables to simulate optimal scenarios.

Impact

- Insights into the warehouse capacity utilization by months through simulating business implications of various parameters such as manpower, orders' growth, operational cost, etc., facilitating strategic decisions regarding the timing and location of new warehouses
- Comprehensive visibility to the client regarding an opportunity to extend the demand fulfillment from existing warehouses for additional 2 years by redistributing certain categories of online orders from warehouses to offline stores

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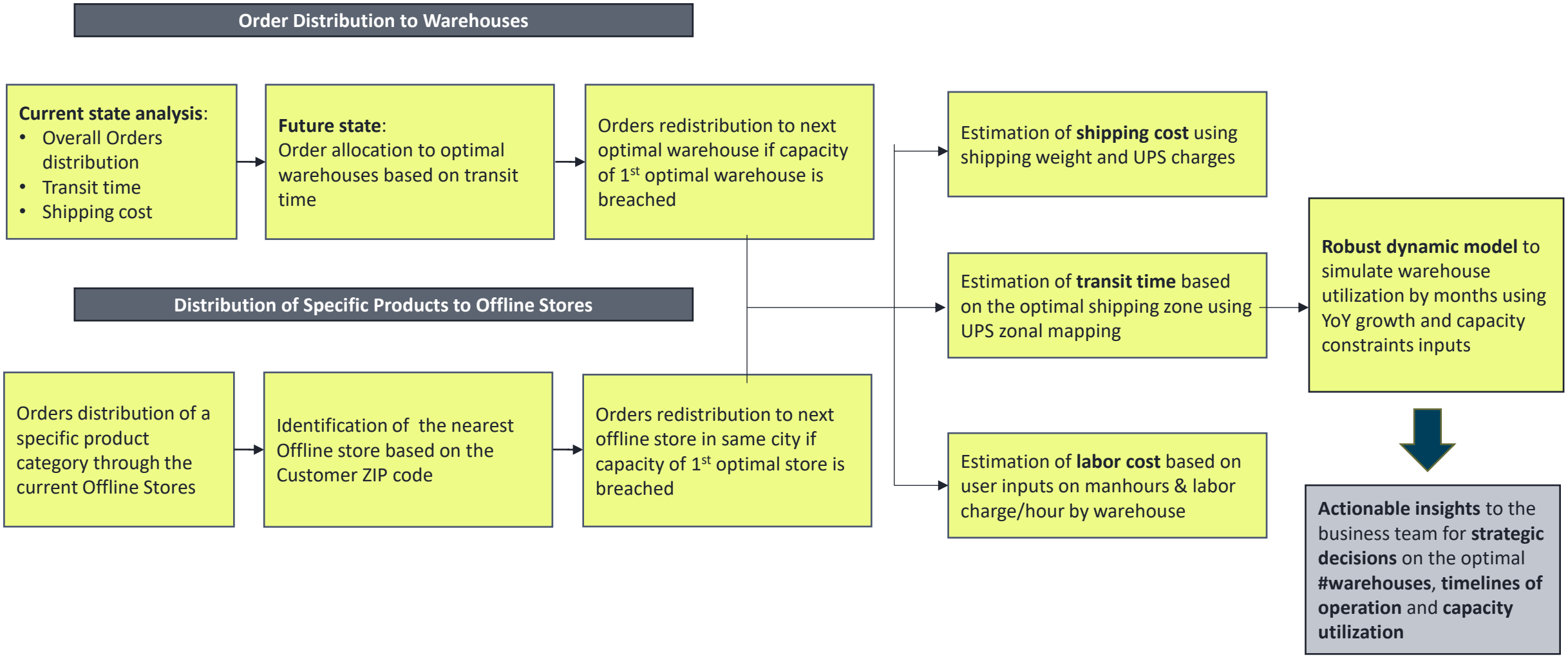
Methodology for optimizing orders' fulfillment from warehouses



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Dynamic flexibility for users to input parameters for simulation

Input Fields

Phases	Year	Month	Year & Month
Phase 1	2023	Jan	Jan.2023
Phase 2	2025	Sep	Sep.2025
Phase 3	2026	Sep	Sep.2026

<< First select phase time for Phase 2 and phase 3

Used for calculating demand

YoY Orders Growth	% Growth
CY23	
CY24	20%
CY25	20%
CY26	20%
CY27	20%
CY28	20%
CY29	20%
CY30	20%
CY31	20%
CY32	20%

Used for calculating capacity

# People	Warehouse 1	Warehouse 2	Warehouse 3	Warehouse 4	Warehouse 5	Warehouse 6
CY23	20	3	3	3	5	3
CY24	20	3	3	3	5	3
CY25	20	3	3	3	5	3
CY26	20	3	3	3	5	3
CY27	20	3	3	3	5	3
CY28	20	3	3	3	5	3
CY29	20	3	3	3	5	3
CY30	20	3	3	3	5	3
CY31	20	3	3	3	5	3
CY32	20	3	3	3	5	3

Used for calculating capacity and labor cost

Warehouse	Orders/Person/Day	$/ Hour	Working Hours/ Day
Warehouse 1	70	$20	7.5
Warehouse 2	80	$20	7.5
Warehouse 3	80	$20	7.5
Warehouse 4	80	$20	7.5
Warehouse 5	80	$20	7.5
Warehouse 6	80	$20	7.5

Used for calculating capacity and labor cost

Month	Working Days
Jan	19
Feb	20
Mar	21
Apr	19
May	20
Jun	21
Jul	19
Aug	20
Sep	21
Oct	19
Nov	20
Dec	21
Total	**240**

Used for calculating the discovery orders that can be fulfilment from FSS

Door	City	Status (CY23)	Opening Month	Opening Year	ICAT Discovery orders/Day
Total					**820**
Region 1					**100**
Store 1	City 1	Open	Jan	2023	20
Store 2	City 1	Open	Jan	2023	20
Store 3	City 2	Open	Jan	2023	20
Store 4	City 3	Open	Jan	2023	20
Store 5	City 3	Open	Jan	2023	20

Used for calculating the capacity of FSS doors to fulfil discovery orders in the upcoming years

FSS Doors	# New FSS Doors	Discover Orders/ Day
CY26	3	20
CY27	3	20
CY28	3	20
CY29	3	20
CY30	3	20
CY31	3	20
CY32	3	20

Functionality for users to input various parameters and simulate different scenarios through the model

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Comparison of capacity utilization and timelines for different scenarios

Summary of all scenarios

S.No	Phase 1	Phase 2	Phase 3	Last Year till which demand can be fulfilled	CY24			CY26			CY27		
	Current	Jan.2024	Feb.2025		Number of months having more demand than its capacity	Annual Demand Fulfilment Status	Warehouses with more demand then their capacity	Number of months having more demand than its capacity	Annual Demand Fulfilment Status	Warehouses with more demand then their capacity	Number of months having more demand than its capacity	Annual Demand Fulfilment Status	Warehouses with more demand then their capacity	Number of months having more demand than its capacity
1	Warehouse 1| Warehouse 2| Warehouse 3| Warehouse 4	Warehouse 5	Warehouse 6	CY30	4	Yes	Warehouse 2, Warehouse 3, Warehouse 4	5	Yes	Warehouse 2, Warehouse 3, Warehouse 4, Warehouse 6, Warehouse 10, Warehouse 8, Warehouse 9	7	Yes	Warehouse 1, Warehouse 2, Warehouse 3, Warehouse 4, Warehouse 5, Warehouse 6, Warehouse 10, Warehouse 8, Warehouse 9	8
2	Warehouse 1| Warehouse 2| Warehouse 3| Warehouse 4	Warehouse 5	Warehouse 6	CY30	11	Yes	Warehouse 2, Warehouse 3, Warehouse 4	9	Yes	Warehouse 3, Warehouse 4, Warehouse 5, Warehouse 6, Warehouse 10, Warehouse 9	12	No	Warehouse 1, Warehouse 2, Warehouse 3, Warehouse 4, Warehouse 5, Warehouse 6, Warehouse 10, Warehouse 9, Warehouse 7	12
3	Warehouse 1| Warehouse 2| Warehouse 3| Warehouse 4	Warehouse 5	Warehouse 6	CY30	4	Yes	Warehouse 2, Warehouse 3, Warehouse 4	5	Yes	Warehouse 2, Warehouse 3, Warehouse 4, Warehouse 6, Warehouse 10, Warehouse 8, Warehouse 9	7	Yes	Warehouse 1, Warehouse 2, Warehouse 3, Warehouse 4, Warehouse 5, Warehouse 6, Warehouse 10, Warehouse 8, Warehouse 9	8
4	Warehouse 1| Warehouse 2| Warehouse 3| Warehouse 4	Warehouse 5	Warehouse 6	CY30	11	Yes	Warehouse 2, Warehouse 3, Warehouse 4	10	Yes	Warehouse 3, Warehouse 4, Warehouse 5, Warehouse 6, Warehouse 10, Warehouse 9	12	No	Warehouse 1, Warehouse 2, Warehouse 3, Warehouse 4, Warehouse 5, Warehouse 6, Warehouse 10, Warehouse 9, Warehouse 7	12
5	Warehouse 1| Warehouse 2| Warehouse 3| Warehouse 4	Warehouse 5	Warehouse 6	CY30	4	Yes	Warehouse 2, Warehouse 3, Warehouse 4	5	Yes	Warehouse 2, Warehouse 3, Warehouse 4, Warehouse 6, Warehouse 10, Warehouse 8, Warehouse 9	7	Yes	Warehouse 1, Warehouse 2, Warehouse 3, Warehouse 4, Warehouse 5, Warehouse 6, Warehouse 10, Warehouse 8, Warehouse 9	8
6	Warehouse 1| Warehouse 2| Warehouse 3| Warehouse 4	Warehouse 5	Warehouse 6	CY30	4	Yes	Warehouse 2, Warehouse 3, Warehouse 4	5	Yes	Warehouse 2, Warehouse 3, Warehouse 4, Warehouse 6, Warehouse 10, Warehouse 8, Warehouse 9	7	Yes	Warehouse 1, Warehouse 2, Warehouse 3, Warehouse 4, Warehouse 5, Warehouse 6, Warehouse 10, Warehouse 8, Warehouse 9	8
7	Warehouse 1| Warehouse 2| Warehouse 3| Warehouse 4	Warehouse 5	Warehouse 6	CY30	11	Yes	Warehouse 2, Warehouse 3, Warehouse 4	12	Yes	Warehouse 3, Warehouse 4, Warehouse 5, Warehouse 6, Warehouse 10, Warehouse 9	12	No	Warehouse 1, Warehouse 2, Warehouse 3, Warehouse 4, Warehouse 5, Warehouse 6, Warehouse 10, Warehouse 9, Warehouse 7	12

Provides detailed comparison of scenarios with timeline feasibility along with average transit time, shipping cost and labour costs

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Deep dive into the projections for an individual scenario

Ship Specific Category Orders from Offline Stores?	Yes
Scenario Number	1

<< Select scenario from dropdown

	Phase 1	Phase 2	Phase 3
Warehouses	Warehouse 1 to Warehouse 4	Warehouse 5	Warehouse 6
Max timeline	Nov.2026	Nov.2027	Nov.2028

Annual Summary of the selected scenario

	For Warehouse		For FSS		Total			
Year	Shipping Cost (in k's)	Labor Cost (in k's)	Shipping Cost (in k's)	Labor Cost (in k's)	Total Cost (in k's)	Annual Demand Fulfillment Status	Warehouses with more demand then their capacity	Number of months having more demand than its capacity
CY23	$ 3,000k	$ 1,000k	$ 2,000k	$ 400k	$ 6,400k	Yes	Warehouse 3, Warehouse 4	3
CY24	$ 4,000k	$ 1,000k	$ 2,000k	$ 1,000k	$ 8,000k	Yes	Warehouse 3, Warehouse 4	5
CY25	$ 5,000k	$ 2,000k	$ 2,000k	$ 1,000k	$ 10,000k	Yes	Warehouse 3, Warehouse 4	6
CY26	$ 6,000k	$ 2,000k	$ 3,000k	$ 1,000k	$ 12,000k	Yes	Warehouse 3, Warehouse 4, Warehouse 6	10
CY27	$ 7,000k	$ 2,000k	$ 3,000k	$ 1,000k	$ 13,000k	Yes	Warehouse 2, Warehouse 3, Warehouse 4, Warehouse 5, Warehouse	11
CY28	$ 8,000k	$ 2,000k	$ 3,000k	$ 1,000k	$ 14,000k	No	Warehouse 1, Warehouse 2, Warehouse 3, Warehouse 4, Warehouse	12
CY29	$ 10,000k	$ 2,000k	$ 4,000k	$ 1,000k	$ 17,000k	No	Warehouse 1, Warehouse 2, Warehouse 3, Warehouse 4, Warehouse	12
CY30	$ 12,000k	$ 2,000k	$ 4,000k	$ 1,000k	$ 19,000k	No	Warehouse 1, Warehouse 2, Warehouse 3, Warehouse 4, Warehouse	12
CY31	$ 15,000k	$ 3,000k	$ 4,000k	$ 1,000k	$ 23,000k	No	Warehouse 1, Warehouse 2, Warehouse 3, Warehouse 4, Warehouse	12
CY32	$ 18,000k	$ 3,000k	$ 4,000k	$ 1,000k	$ 26,000k	No	Warehouse 1, Warehouse 2, Warehouse 3, Warehouse 4, Warehouse	12

Annual/Monthly Capacity Utilization and Demand Fulfillment Status of each Warehouse

	CY23												CY24	CY25	CY26	CY27	CY28
Warehouse	Jan.2023	Feb.2023	Mar.2023	Apr.2023	May.2023	Jun.2023	Jul.2023	Aug.2023	Sep.2023	Oct.2023	Nov.2023	Dec.2023	Annual Demand Fulfillment Status	Annual Demand Fulfillment Status	Annual Demand Fulfillment Status	Annual Demand Fulfillment Status	Annual Demand Fulfillment Status	Annual Demand Fulfillment Status
Warehouse 1	20%	20%	20%	20%	20%	20%	20%	30%	40%	30%	40%	60%	Yes	Yes	Yes	Yes	Yes	No
Warehouse 2	20%	20%	10%	20%	20%	20%	10%	20%	30%	20%	30%	30%	Yes	Yes	Yes	Yes	Yes	Yes
Warehouse 3	80%	60%	60%	70%	70%	60%	60%	90%	100%	80%	100%	100%	Yes	Yes	Yes	Yes	Yes	No
Warehouse 4	60%	50%	50%	50%	60%	40%	50%	60%	80%	60%	80%	100%	Yes	Yes	Yes	Yes	Yes	No
Warehouse 5													Yes	Yes	Yes	Yes	Yes	Yes
Warehouse 6													Yes	Yes	Yes	Yes	Yes	Yes
Overall Capacity Fulfillment Status	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Overall Capacity Utilization	30%	30%	30%	30%	30%	30%	30%	40%	50%	40%	50%	60%						

Annual/Monthly Order Distribution in each Warehouse

	CY23												CY24	CY25	CY26	CY27	CY28
Warehouse	Jan.2023	Feb.2023	Mar.2023	Apr.2023	May.2023	Jun.2023	Jul.2023	Aug.2023	Sep.2023	Oct.2023	Nov.2023	Dec.2023	Order Distribution	Order Distribution	Order Distribution	Order Distribution	Order Distribution	Order Distribution
Warehouse 1	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	60%	50%	50%	50%	50%	50%	50%
Warehouse 2	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Warehouse 3	30%	30%	30%	30%	20%	20%	30%	30%	20%	30%	20%	20%	20%	20%	20%	20%	20%	10%
Warehouse 4	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	10%	10%
Warehouse 5														0%	10%	10%	10%	10%
Warehouse 6																0%	10%	10%
Total Orders	14,000	12,000	12,000	12,000	14,000	12,000	11,000	16,000	21,000	14,000	21,000	28,000	187,000	226,000	261,000	313,000	376,000	452,000

Provides the yearly costs along with the fulfilment status of the Warehouses for user selected scenario#

Capacity utilisation and Order distribution in the warehouses in a particular month after re-distribution of orders based on user inputs

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