DRAFT

GOODBABY GROUP: THE UPFRONT WAREHOUSE DECISION

On an early spring morning of 2019, a pile of files was placed on Jinrun Li's desk. Li, a veteran in the retail industry, was the Chief Logistics Officer for Goodbaby Group (Goodbaby), a leading retailer of maternal and child products in China. Among these files was a proposal from the Marketing Department to set up a kids' shoe store in a high-end shopping mall in Shanghai for the following fall. Li was expected to assess the proposal with a supply chain management perspective. Usually, a new store meant no more than another end point to the whole logistic network. However, this one came with added complexity as floor space was too small for the type of stores preferred by the Marketing Department. Li had to decide if a new supply chain structure that had been pilot tested over the past year would be an appropriate solution to satisfy the Marketing Department preference.

Goodbaby: From Strollers to a whole Range of Products and Services
The retailer founded 30 years ago, started with one type of products, baby strollers. Through the years, the company expanded to a whole portfolio of products including cots, highchairs, children's clothing, and nursing supplies. They also developed capabilities in retail logistics that were leveraged by other brand-based companies. In fact, using a different distribution channel than the one for its own brands, Goodbaby would manage stores and its related logistics for clients carrying national and even international brands.

The new store proposed by the Marketing Department was for one of its client brands. This particular client wanted Goodbaby to manage a set of stores that were categorized into four levels. The 'A' stores were usually located in the heart of downtowns and in high-end shopping malls. These stores main characteristics included (i) a wider range of stock-keeping-units (SKUs) in store, (ii) the newest styles, and (iii) limited special edition of products. The 'A' stores' sales area (where customers could shop) needed to be minimally 100 square-meters (m^2) in order to provide a comfortable shopping experience. In contrast, 'B' stores were smaller than 'A' and carried fewer SKUs — they were catering a larger market segment not as fashion and trend oriented as the segment targeted by the 'A' stores. Located in most Shanghai shopping malls, these 'B' stores were cash cows for Goodbaby. The 'C' stores were much smaller outlets with a narrower range of SKUS. 'D' stores were outlets for off-season products sold at a significant discount.

The New Store
The Marketing Department proposed store would be located in a high-end shopping mall in Shanghai. The total space available for the store was 120 m^2 which by convention allowed for a sale area of 85 m^2 (35 m^2 needed for the back store inventory). The Marketing Department would much prefer to have an 'A' store in this high end mall. The Marketing Department was inclined to settle for 'B' store as the dimension was

more suited for this level of store. However, a 'B' store would not be competitive in such a mall particularly when it came to brand identity and the customer segment targeted.

Forcing a sale area of 100 m^2, as suggested by the brand company specifications for an 'A' store meant to reduce the back store space and, therefore, the inventory that can be held at the store. While there was regular replenishment from regional warehouses to stores, it was still common to see out-of-stock SKUs in stores due to volatile demands between two replenishments. The rise of the e-commerce and fast delivery service had increased the consumers' expectations in terms of service level in retail stores. They simply had less patience for out-of-stock situations. When they wanted a particular product, they wanted it right away. Out-of-stock SKUs practically translated into lost sales. Higher in-store inventory level was essential to maximize sales. Li understood that the current replenishment time from the regional warehouse to the store was not compatible with less inventory in the store. That was the main conundrum that Li faced with the new store proposal.

Existing Supply Chain Structure
The stores in Shanghai were supplied from a regional warehouse, which provided product directly to stores. The regional warehouse was located outside of Shanghai resulting in a long transportation time of about 24 hours. On top of the transportation and delivery time, the stores orders needed to be picked, moved to the trucks and logistically managed (e.g., shipping schedule). All this pre-transportation work for the 53 stores in the city was rather manual and labor intensive which slowed down the speed of the whole process. Overall, the lead time on average was about 72 hours (3 days) from order to delivery to the store. Also, the existing supply chain allowed only one store replenishment per week (i.e., one order to be delivered each week). This supply chain structure created two problems:

1. The quantity distributed for the initial sales of a new SKU was quite large. During the high season, 60% of the forecasted season sales for all new products were held in stores — the storage area had to be big enough;

2. When a store ran out of stock during a replenishment cycle, the store manager would contact other stores to ask for the product. However, the instant transshipment between stores proved to be expensive. The transportation cost between stores was averaging nine yuan (CNY) excluding the additional cost related to the store personnel time needed to package and handle the products. According to an internal report, from July 2016 to June 2017, the transshipment costs were approximatively 3.5 million CNY for the company, almost equivalent to the total direct delivery costs from the regional warehouse to stores for the same period.

Facing such a situation, Li wanted to reconsider the current supply chain structure. He pursued the goal to build in quicker delivery cycles to the store without negatively impact the service level. More rapid replenishments converted into lower inventory holding costs. In turn, reduced level of inventory held at the stores meant larger space for the sale areas. Li suddenly remembered the concept of the upfront warehouse. Upfront warehouses were quite popular among retailers since 2017. It consisted in an in-city (smaller) warehouse that could deliver products to consumers, usually within hours. Retailer giants such as JD and Alibaba had built upfront warehouses to provide rapid delivery for online orders, direct to consumers. Can the idea be replicated to supply the stores managed by Goodbaby? After several discussion, Goodbaby's management team decided to have an experimental upfront warehouse project in the Shanghai region (See Exhibit 1).

The "520" project

The pilot project was named "520" for (i) replenishment time that was not exceeding five hours, (ii) two replenishments a day, and (iii) zero out-of-stock situation. With an upfront warehouse, the previous supply chain structure was replaced with an intermediary step (Exhibit 1). According to the "520" plan, the upfront warehouse acted as a buffer for product flow from regional warehouse to stores. It provided replenishment to stores rapidly with the help of an automatic ordering system that monitored in-store inventory levels in real time.

This way, the replenishment journey to the stores was shortened significantly, particularly by having some of the manual tasks replaced by real time information systems. Products from regional warehouse would arrive at the upfront warehouse within 12 hours and from the upfront warehouse to the stores within 5 hours. As a result of these quicker replenishments, there would be no need to hold as many products in stores and the area devoted to back store inventory could be reduced from 20% to 10% of the total area.
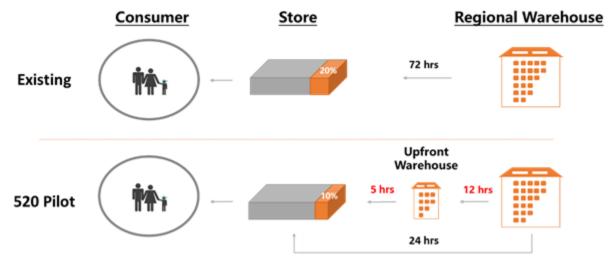
The "520" project was deployed to 27 out of 53 stores in Shanghai as a pilot in 2018. The 150 m^2 upfront warehouse was located in a relatively inexpensive district with, however, an excellent transportation network to these 27 stores. The upfront warehouse held between 700 to 800 SKUs which was about 30% of the total of SKUs for any given season. Usually, the upfront warehouse received supplies from the regional warehouse once a day. The total number of product units (e.g., a pair of shoes) distributed daily to the 27 stores from the upfront warehouse was about 200. The Logistics Department signed a contract with a local express-delivery courier firm and the boxes from the upfront warehouse were guaranteed to be delivered to the stores within 4 hours. The transportation cost charged by the courier averaged three CNY.

The replenishment orders are placed by an information system automatically. The upfront warehouse replenishment process was working as follows:

1. When the inventory volume in a store for a particular SKU reached a certain threshold, an order will be sent electronically to the upfront warehouse;
2. Workers at the upfront warehouse then picked and packed the products into boxes according to information system generated orders;
3. Couriers picked the boxes from the upfront warehouse and delivered them to store within four hours.

Li received some data from the Logistics Department illustrating the inventory and flow for six SKUs, over three of the 27 piloted stores, over a same 77-day period in 2017 (with the existing supply chain structure) and 2018 (with the upfront warehouse). Exhibit 2 presented an excerpt of that data for one of the six SKUs, for one of the three stores for 2017 and 2018. Li wanted to review the data before making a recommendation to Goodbaby's management on the new store. Was it possible for the proposed new store to have at least 100 m^2 (i.e., less back store space for the inventory) by incorporating an upfront warehouse to the supply chain structure?

EXHIBIT 1: EXISTING SUPPLY CHAIN VS. PILOT PROJECT

Source: Created by authors

EXHIBIT 2: COMPARATIVE INVENTORY DATA SAME PERIOD (2017 VS. 2018)*

Day	2017					2018					
	InStore	TransshipOut	TransshipIn	Regional	Sales	InStore	TransshipOut	TransshipIn	Upfront	Regional	Sales
1	4	0	0	0	0	3	0	0	0	0	0
2	4	0	0	0	0	3	0	0	0	0	0
3	4	0	0	0	0	3	0	0	0	0	0
4	4	0	0	0	0	3	0	0	0	0	0
5	4	0	0	0	0	3	0	0	0	0	0
6	4	0	0	0	0	3	0	0	0	0	0
7	4	0	0	0	0	3	0	0	0	0	0
8	4	0	0	0	0	3	0	0	0	0	0
9	4	0	0	0	0	3	0	0	0	0	0
10	4	0	0	0	0	3	0	0	0	0	0
11	4	0	0	0	0	3	0	0	0	0	0
12	4	0	0	0	0	3	0	0	0	0	0
13	4	0	0	0	0	3	0	0	0	0	0
14	4	0	0	0	1	3	0	0	0	0	0
15	3	0	0	0	0	3	0	0	0	0	0
16	3	0	0	0	0	3	0	0	0	0	0
17	3	0	0	0	0	3	0	0	0	0	0
18	3	0	0	0	0	3	0	0	0	0	0
19	3	0	0	0	0	3	0	0	0	0	0
20	3	0	0	0	0	3	0	0	0	0	0
21	3	0	0	0	0	3	0	0	0	0	0
22	3	0	0	0	0	3	0	0	0	0	0
23	3	0	0	0	0	3	0	0	0	0	0
24	3	0	0	0	0	3	0	0	0	0	0
25	3	0	0	0	0	3	0	0	0	0	0
26	3	0	0	0	0	3	0	0	0	0	0
27	3	0	0	3	0	3	0	0	0	0	0
28	6	0	2	0	0	3	0	0	0	0	0
29	8	0	0	0	0	3	0	0	0	0	0
30	8	0	0	0	0	3	0	0	0	0	0
31	8	0	0	0	0	3	0	0	0	0	0
32	8	0	0	0	0	3	0	0	0	0	0
33	8	0	0	0	0	3	0	0	0	0	0
34	8	0	0	0	0	3	0	0	0	0	0
35	8	0	0	0	0	3	0	0	0	0	0
36	8	0	0	0	0	3	0	0	0	0	0
37	8	0	0	0	0	3	0	0	0	0	0
38	8	0	0	0	1	3	0	0	0	0	0
39	7	0	0	0	0	3	0	0	0	0	0
40	7	0	0	0	0	3	0	0	0	0	0
41	7	0	0	0	0	3	0	0	0	0	0
42	7	0	0	0	0	3	0	0	0	0	0
43	7	0	0	1	0	3	0	0	0	0	0
44	8	0	0	0	0	3	0	0	0	0	0
45	8	0	0	0	0	3	0	0	0	0	0
46	8	0	0	-1	0	3	0	0	0	0	0
47	7	0	0	0	1	3	0	0	0	0	0

Day											
48	6	0	0	0	0	3	0	0	0	0	0
49	6	0	0	0	0	3	0	0	0	0	1
50	6	0	0	0	0	2	0	0	0	0	1
51	6	0	0	0	0	1	0	0	0	0	0
52	6	0	0	0	0	1	0	0	2	0	0
53	6	0	0	0	0	3	0	0	0	0	0
54	6	0	0	0	0	3	0	0	0	0	1
55	6	0	0	0	0	2	0	0	0	0	0
56	6	0	0	0	0	2	0	0	1	0	0
57	6	0	0	0	0	3	0	0	0	0	0
58	6	0	0	0	0	3	0	0	0	1	0
59	6	0	0	0	0	4	0	0	0	0	0
60	6	0	0	0	0	4	0	0	0	0	0
61	6	0	0	0	0	4	0	0	0	0	0
62	6	0	0	0	0	4	0	0	0	0	1
63	6	0	0	0	0	3	0	0	0	4	1
64	6	0	0	0	1	6	0	0	0	0	0
65	5	0	0	0	0	6	0	0	0	0	0
66	5	0	0	0	0	6	0	0	0	0	0
67	5	0	0	0	0	6	0	0	0	0	0
68	5	0	0	0	0	6	0	0	0	0	0
69	5	0	0	0	0	6	0	0	0	0	0
70	5	0	0	0	0	6	0	0	0	0	0
71	5	0	0	0	0	6	0	0	0	0	0
72	5	0	0	0	0	6	0	0	0	0	0
73	5	0	0	0	1	6	0	0	0	0	0
74	4	0	0	0	1	6	0	0	0	0	0
75	3	0	0	0	0	6	0	0	0	0	0
76	3	0	0	0	0	6	0	0	0	0	0
77	3	0	0	0	0	6	0	0	0	0	0

* *Excerpt from a larger database. Data for one SKU, in one store, same period of 77 days in 2017 (existing supply chain structure) vs. in 2018 (pilot with upfront warehouse).*

Source: Company Files

Legend:

- "InStore": in-store inventory in the morning.
- "TransshipOut": the number of items transshipped to other stores.
- "TransshipIn": the number of items transshipped from other stores.
- "Upfront": number of product units replenished from the upfront warehouse.
- "Regional": number of products units received from (positive) or returned to (negative) the regional warehouse from the store.
- Sales.