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B-Kay tech: HORIZONTAL COLLABORATION in Logistics

Robert Boute, Tom Van Steendam, and Stefan Creemers wrote this case solely to provide material for class discussion. The authors do not intend to illustrate either effective or ineffective handling of a managerial situation. The authors may have disguised certain names and other identifying information to protect confidentiality.

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Brandon Kay had been working at B-Kay Tech, a multinational company that distributed electronic consumer goods in the mid to high-end market and had around 800 full-time employees, since 2005. With its headquarters in Brussels, Belgium, the majority of its operations were in Europe, though B-Kay Tech was also active in North America and Eurasia.

Kay had started with the company as a planning analyst in the Belgian office in 2005, and between 2008 and 2016, he was project manager in the supply chain office. During that period, he successfully established several supply chain improvement programs, with one of his major achievements being the vendor-managed inventory collaboration agreement he had set up with the company’s two biggest retailers in 2012.

The agreement with the retailers resulted in higher delivery order stability, which helped B-Kay Tech to improve the planning of production and transport, in turn resulting in better resource planning and shorter delivery lead times. Service levels rose over the following years, while at the same time, inventory levels were reduced, not only in Kay’s own warehouses but also in those of the retailers.

Owing to this collaboration agreement, Kay was able to achieve significant supply chain savings for the company over the years, which in part led to his promotion to supply chain director at the start of 2017. In order to impress B-Kay Tech’s vice-president of Operations and Supply Chain, Kay wanted to devise a new breakthrough innovation project. He had heard about a different type of supply chain collaboration—horizontal collaboration—that involved partnerships with companies that operated at the same level in the supply chain; these companies could even be (potential) competitors. The idea behind horizontal collaboration was to bundle the partner companies’ shipments in the same transport, so that any available space in one company’s truck hauls could be utilized to transport shipments for other companies, reducing the overall number of trucks required. With the logistics team responsible for the greatest part of the company’s carbon footprint, this shift would not only affect B-Kay Tech’s bottom line, but would also help the company to reach the stringent 2020 sustainability targets set out by management.

Kay discussed this idea with his vice-president, who agreed that it could be a breakthrough project and signed off on it—with the stipulation that first results be visible within the year, and that Kay looked at more than just monetary savings in transport. With top management support in place, how could Kay find potential partners within the designated time frame and convince them, too, of the benefits of a collaboration?

Driving logistics efficiencies through collaborative shipping

B-Kay Tech had its own fleet of 25 trailer trucks for the local logistics that was supplemented with outsourced third-party logistics (3PL) shipping for the international lanes. One of the major inefficiencies Kay’s logistics team faced was that many of the trucks were driving only half-full. Owing to strict delivery demands and high inventory holding costs, Kay’s planning team members had only a few degrees of freedom to improve their truckload factors, especially if they did not want their service levels to suffer. Through collaborative shipping with another company, Kay could fill the empty space in his trucks, resulting in greater sustainability and cost improvements.

Given the high value density of B-Kay Tech’s products and the limited number of shipments, Kay felt that horizontal collaboration could improve the current situation. With the initiative for collaboration having originated with him, Kay was in charge of detecting bundling opportunities with other companies. This type of bundling was proactive: opportunities were detected prior to shipment, and if desired, plans were changed and shipments were delayed or moved forward in order to benefit from joint transport. This system contrasted with traditional freight groupage, which was mainly reactive: in groupage shipping, the logistics provider decided on bundling less than container loads in the execution phase, rather than in the planning phase, and the consolidation was only geographical (i.e., the timing of the shipments was not allowed to change).

It became clear to Kay that to maximize the gains of collaborative shipping, he had to alter his replenishment policy and be more flexible; he had to replenish inventories either sooner or later than originally planned to benefit from joint transport. He was not yet sure what this additional flexibility would mean for his inventory requirements.

Revisiting old friendships

At the annual Supply Chain Award ceremony in March 2017, Kay had gotten back in contact with David Rollins, a former colleague who had started working at WARE-TOUCH during the summer of 2013. WARE-TOUCH was a U.K.-based multinational company that produced and distributed everyday consumer goods throughout Europe and the Middle East, and whose production sites and distribution centres were spread across Europe and Turkey.

On one of its lanes towards Southern Europe, WARE-TOUCH travelled more or less the same route from its distribution centre in Flanders, Belgium, to its distribution centre in the Lake Como area in Northern Italy. In addition, WARE-TOUCH’s warehouses were located only a few kilometres from B-Kay Tech’s warehouses. Given that WARE-TOUCH arranged most of its international logistics on the spot market, it was not bound by a contract with a 3PL for that lane. Kay decided to get in touch with Rollins to see whether WARE-TOUCH would be interested in collaborating and bundling transport in the future.

Synchronization of orders by joint replenishment

As of March 2017, Kay’s team managed inventories using a traditional reorder point and order quantity model: whenever the inventory position (inventory on hand plus items on order) dropped to the reorder point, an order was placed for a fixed reorder quantity. The reorder point was based on the demand’s forecast error during lead time, whereas the order quantity was defined to balance the cost of inventory with the cost of transport.

To synchronize shipments in a collaborative shipping agreement, Kay’s inventory replenishment policy needed to be adapted to allow for joint orders with WARE-TOUCH. Therefore, he devised a replenishment policy that was both straightforward and transparent: when one or both companies placed an order (when its inventory position dropped to its reorder level) and organized a transport, the other company could decide to join the transport. With sufficient inventory, it was not necessary to replenish and fill the truck needlessly. On the contrary, when the inventory position was close to reaching its reorder point, it was worthwhile to fill the truck and to replenish a smaller amount. This policy allowed for the placement of joint orders, yet each company maintained the flexibility not to join the order in the case that they still had sufficient inventory.

The business case of a horizontal logistics alliance

Despite their distribution centres being close to each other, Kay was aware that WARE-TOUCH was in a different type of business than B-Kay Tech was, and that their daily logistics were not necessarily the same. For starters, B-Kay Tech worked with a fixed 3PL contract for its international lanes, whereas WARE-TOUCH sourced its transport on the spot market. With respect to products, B-Kay Tech offered low-volume, high-value-density products, while WARE-TOUCH supplied low-value commodities in high volumes (see Exhibit 1). Given its high volumes, WARE-TOUCH managed to ship full truckloads. On average, it shipped a full truck of 100 boxes to its distribution centre in the Lake Como area 60 times per year, where it carried about five weeks’ worth of inventory (see Exhibit 2). B-Kay Tech shipped between once and twice per week (100 times per year, on average), but its trucks were only 35 per cent full. Due to high inventory costs and high shipment frequency, its order quantity was only 35 boxes per truck. As a result, B-Kay Tech’s distribution centre carried only four weeks’ worth of inventory, on average.

For Kay, co-loading one of his trucks would enable him to fill the empty space in the truck and to share a major transport cost, even if his truck had to make a slight detour to pick up the order at WARE-TOUCH. But he wondered what the advantages of this arrangement were for WARE-TOUCH. After all, WARE-TOUCH already shipped full truckloads and at full efficiency.

To find out, Kay decided to simulate the costs in the case that B-Kay Tech and WARE-TOUCH both shifted towards collaborative shipping. If Kay initiated the order (i.e., if B-Kay Tech reached its reorder point), he would fill the truck with 30 boxes. With WARE-TOUCH joining the transport, it would fill the remaining space for 70 boxes. If WARE-TOUCH replenished its inventory, it would order 80 boxes, and Kay would fill the remaining truck space with 20 boxes. This way, Kay would be able to increase B-Kay Tech’s shipment frequency from 100 to 115 shipments per year; 90 shipments would be initiated by himself (for urgent inventory replenishments when the inventory position dropped below the reorder point), and 25 would be joined with WARE-TOUCH’s transport. Under this collaboration, WARE-TOUCH would be able to reduce the number of (self-initiated) transports from 60 to 50 per year, a reduction of over 15 per cent. In addition, WARE-TOUCH benefited from joining B-Kay Tech’s trucks 30 times per year, which meant that its shipment frequency would increase by more than 30 per cent (see Exhibit 3).

Next, Kay analyzed the impact of the collaborative shipping agreement on each company’s cost performance. If he placed an order and organized the transport, B-Kay Tech would be charged the major order costs (i.e., transport costs to Northern Italy), regardless of whether or not WARE-TOUCH joined the transport. If WARE-TOUCH joined Kay’s transport, it paid for the minor order costs (i.e., the marginal cost of handling and picking up the goods at the WARE-TOUCH distribution centre). The same reasoning would be applied if Kay joined the WARE-TOUCH truck, in which case WARE-TOUCH bore the major order costs and B-Kay Tech had to pay only the minor order costs.

Kay calculated that, under collaboration, the transport costs for B-Kay Tech (with both major and minor order costs but without inventory holding costs) would decrease slightly (less than 5 per cent), and the company’s inventory requirements would also decrease (from four to three and a half weeks’ worth of inventory). To his surprise, the benefits of this collaboration were much greater for WARE-TOUCH, as it would be able to reduce its transport costs by 10 per cent. Kay observed that although WARE-TOUCH would have to increase its inventories, this was to only a minor extent (from five to five and a quarter weeks’ worth of inventory).

Trust and adequate gainsharing

Kay found that there would clearly be gains for both companies if they were to collaborate, but the gains were not automatically distributed evenly. He considered several angles from which to approach WARE-TOUCH with his proposal, and drafted a partnership idea that was both equitable and sustainable. However, he quickly realized he would need a neutral third party to make the arrangement work from a legal point of view.

Kay decided to call Erika Owens, a former classmate who specialized in commercial law and who had started her own firm as a collaborative shipping trustee in 2014. After speaking with her, it became clear to Kay how vital it would be to have a neutral trustee party to gather, analyze, and govern any information sensitive to anti-trust laws. In addition, Owens could take care of constructing a legal framework with multilateral contracts that would be anti-trust compliant. This framework would then also define the rules of engagement and secure the mechanisms for entry, exit, and gainsharing in the partnership, thereby ensuring continuity and stability in the collaboration.

To deal with this legal complexity without hurting the savings, Owens presented a business proposal to Kay: she would take care of the legal set-up and would fill the trustee role for the first year, in exchange for access to B-Kay Tech and WARE-TOUCH’s shipment data. This access would allow her to bring in additional partners or wholly new collaboration options at a later stage, at which point she would then be remunerated based on a percentage of the realized gains. In this way, Kay would be able to bring a financially fair and legally sound proposal to the negotiation table without having to hand over part of the gains realized at that point to the trustee.

With all of the building blocks identified, the next steps in making the project a reality were clear to Kay: he would need to devise a gainsharing mechanism that would convince WARE-TOUCH to begin the collaboration, and to prepare the negotiations that would undoubtedly follow.

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Robert Boute is a full professor of Operations and Supply Chain Management at Vlerick Business School. Tom Van Steendam is a senior researcher of Operations and Supply Chain Management at Vlerick Business School. Stefan Creemers is a full professor of Operations Management at IESEG School of Management.

Exhibit 1: B-KAY TECH AND WARE-TOUCH COMPANY DATA

|  |  |  |
| --- | --- | --- |
|  | B-Kay Tech | WARE-TOUCH |
| Average demand (per week) | 5 | 10 |
| Standard deviation demand (per week) | 2.5 | 5.0 |
| Annual inventory holding cost | €25.00 | €7.50 |
| Major order cost (transport cost to Northern Italy) | €50.00 | €75.00 |
| Minor order cost (handling cost of picking up the goods at the other company) | €10.00 | €10.00 |
| Total shipment lead time | 1 week | 1 week |
| Required service level | 90% | 90% |

Note: € = EUR = euro. All currency amounts are in EUR unless otherwise specified.

Source: Company documents.

Exhibit 2: B-KAY TECH AND WARE-TOUCH: CURRENT LOGISTICS PERFORMANCE (NO COLLABORATION)

|  |  |  |
| --- | --- | --- |
|  | B-Kay Tech | WARE-TOUCH |
| Order quantity | 35 | 100 |
| Reorder point | 12 | 25 |
| Current service level | 92% | 92% |
| Average inventory level | 20 | 50 |
| Average weeks’ worth of inventory | 4 | 5 |
| Annual inventory holding costs | €500 | €375 |
| Number of transports per year | 100 | 60 |
| Annual transport costs | €5,000 | €4,500 |
| Total annual logistics costs (inventory holding + transport costs) | €5,500 | €4,875 |

Source: Company documents.

Exhibit 3: B-KAY TECH AND WARE-TOUCH: LOGISTICS PERFORMANCE (UNDER COLLABORATION)

|  |  |  |
| --- | --- | --- |
|  | B-Kay Tech | WARE-TOUCH |
| Order quantity (when self-initiated) | 30 | 80 |
| Reorder point | 12 | 25 |
| Joined transport quantity | 20 | 70 |
| Current service level | 92.25% | 93.00% |
| Average inventory level | 17.5 | 55 |
| Average weeks’ worth of inventory | 3.5 | 5.25 |
| Annual inventory holding costs | €437.50 | €412.50 |
| Number of self-initiated transports per year | 90 | 50 |
| Number of transports joined per year | 25 | 35 |
| Annual transport costs | €4,750.00 | €4,050.00 |
| Total annual logistics costs (inventory holding + transport costs) | €5,187.50 | €4,462.50 |

Note: Simulation of costs under collaboration as done by Kay.

Source: Company documents