

HEALTHCARE SUPPLY CHAIN MANAGEMENT: TO SELF-DISTRIBUTE OR NOT TO SELF-DISTRIBUTE, THAT IS THE QUESTION

Jacques Roy, Department of Logistics and Operations Management, HEC Montreal, 3000 Chemin de la Cote-Ste-Catherine, Montreal, Quebec , Canada, H3T 2A7, 514-340-6282, Jacques.roy@hec.ca

Sylvain Landry, Department of Logistics and Operations Management, HEC Montreal, 3000 Chemin de la Cote-Ste-Catherine, Montreal, Quebec , Canada, H3T 2A7, 514-340-6749, sylvain.landry@hec.ca

Martin Beaulieu, CHAINE Research Group, HEC Montreal, 3000 Chemin de la Cote-Ste-Catherine, Montreal, Quebec , Canada, H3T 2A7, 514-340-6751, martin.beaulieu@hec.ca

ABSTRACT

Based on case studies of Canadian and U.S. healthcare organizations, a benchmarking study of 50 Canadian healthcare organizations, and a literature review, this paper explains the reasons for the complexity of supply chains in the healthcare sector and proposes an evaluation grid for categorizing the various distribution options: self-distribution, stockless, and hybrid. We will also review the two opposite options, which have their own advantages and disadvantages.

INTRODUCTION

Over time, studies of supply chain management in the healthcare sector have confirmed its potential for yielding significant benefits. (Azzi et al., 2013, Ebel et al., 2013). Yet despite solutions that have been known for years, studies reveal a certain reluctance to deploy practices that would improve supply chain management in this sector (Azzi et al., 2013, Nachtmann and Pohl, 2009).

This reluctance may be explained by the complexity of such supply chains (Germain et al., 2011; Landry and Beaulieu, 2013). To reduce this complexity, two major strategies have emerged. On the one hand, we find self-distribution, where a group of organizations creates an infrastructure allowing them to play a more active role in distribution management, an internal solution (Azzi et al., 2013). On the other hand, we find stockless materials management, where a healthcare organization entrusts its inventory management operations to a distributor, an external solution (Arthur Andersen, 1990). These two options are in line with the traditional choices related to outsourcing which

translate into make or buy decisions (Bolumole, 2001, Hsiao et al., 2010). Studies have suggested various evaluation grids for selecting one of these two options (O'Daffer and Mooraj, 2011).

Based on case studies of Canadian and U.S. healthcare organizations, a benchmarking study of 50 Canadian healthcare organizations, and a literature review, this study explains the reasons for the complexity of supply chains in the healthcare sector and proposes an evaluation grid for categorizing the various distribution options: self-distribution, stockless, and hybrid. We will also review the two opposite options, which have their own pros and cons.

LOGISTICAL CHALLENGES FACING THE HEALTHCARE SECTOR

Landry and Beaulieu (2013) have summarized the major logistical challenges facing the healthcare sector. First of all, a healthcare organization is the juncture of a wide variety of supplies (pharmaceutical products, medical supplies, office supplies, cleaning products, bedding, etc.). With some families of products, we also observe a frequent turnover resulting from technological development (Ebel et al., 2013; Germain et al., 2011).

Moreover, before a product is sent to the end user - clinical staff or patient - it must make its way through the organization's internal supply chain, including receiving, warehousing, and replenishment as well as, in some cases, processing (cooking, washing, sterilization, etc). Thus, in the healthcare sector, supply chain integration requires the synchronization of an external chain, composed primarily of manufacturers and distributors, with the organization's internal chain (Rivard-Royer et al, 2002).

The central store as vector for integration

If we look at medical supplies, the synchronization of these two supply chains presents a major challenge. In a hospital, health professionals need a wide range of medical supplies to deliver the required care to patients. In addition, the variety and quantity of supplies may differ from one care unit to another depending on the type of unit.

Historically, hospitals had central stores, which served as interfaces between external and internal chains. One of the principal roles of the central store is to receive large quantities of merchandise. In many cases, it must then unpack the goods and sort it according to the type and quantity of products required to meet the needs of individual nursing units. The central store supports the delivery of care by making it unnecessary for nursing staff to deal with external suppliers to meet their day-to-day needs for medical supplies. It thus promotes the optimal use of clinical resources by transferring the responsibility for inventory management to a qualified stakeholder. The nursing units receive quantities

more suited to their consumption instead of dealing with the packaging of suppliers or their minimum order requirements, which would tend to increase inventory levels in each care unit and in the organization as a whole. Finally, the central store can consolidate transportation to the nursing units, avoiding multiple deliveries from numerous suppliers.

The central store thus becomes the ultimate storage area, which can react quickly if there are inventory shortages in the nursing units; a very sensitive issue in healthcare that can impact quality and cost. Clearly, to fulfill this key role, the manager of the central store must carefully set the management parameters for goods stored in the nursing units to be able to meet the needs of the nursing units.

However, in spite of this critical role, studies conducted in more than fifty Canadian hospitals tend to show that these stores often underperform. These stores must often deal with major architectural constraints as the hospital buildings have expanded while their storage space has remained unchanged. Those constraints include scarce space and low ceilings which limit the choice of storage equipment and result in low use of technologies, irregular performance monitoring, and revision of management parameters.

The emergence of solutions

To reduce the above-mentioned complexity and offer a solution to the constraints faced by organizations, stockless distribution emerged in the late 1970s. Stockless - or point-of-use - distribution (Rivard-Royer et al., 2002) is a replenishment approach in which a distributor sorts and packs products according to the specific needs of each nursing unit. The products are delivered directly to the nursing units by the distributor or to the receiving platform of the organization in accordance with the needs expressed by the units (Arthur Andersen, 1990). In these circumstances, the healthcare organization can be said to outsource the management of its store.

Initially met with enthusiasm, this logistic strategy began to be called into question in the mid-1990s. The distributors who had been its biggest proponents also began to revise their positions. Over the years, in an intensely competitive context, distributors had increased their services to organizations, thus cutting into their profit margins. At the same time, they had to deal with manufacturers (their suppliers) who continued to adopt more traditional approaches to managing their business relationships. With little or no visibility at the point of consumption, the manufacturers had low (or erratic) service levels. The withdrawal of some distributors from stockless programs coincided with the financial difficulties of one of them. Some distributors even began to rediscover the merits of calculating the Economic Order Quantity to better balance the distribution efforts with the inventory carrying costs (Rivard-Royer et al., 2002).

This questioning of the traditional model of distributor-driven stockless management was no doubt fuelled by the emergence of integrated delivery networks (IDN) in Canada and

the U.S. resulting from the merger of healthcare organizations and social services. These larger organizations are no longer just actors seeking solutions with external partners; they now have a critical mass that can justify their taking charge of distribution in their own facilities (Anonymous, 2012). This self-distribution model takes the form of a distribution center serving a specific territory. In this context, self-distribution is a form of healthcare network-driven stockless materials management system. Whereas the central store used to supply the service points of its organization, the distribution center fulfills this role for the network. Its volume of activities allows the distribution center to justify investments in more elaborate technologies than could easily be justified by a single central store. Since the distribution center is detached from the organizations it serves, it will not be limited by the architectural constraints experienced by many stores. In these circumstances, the organizations in this territory can abandon their central stores and receive the supplies they need in the quantities required by their nursing units.

THE POSITIONING OF LOGISTICS OPTIONS

The outsourcing of logistics activities has been the subject of many synthesis reports (Bolumole, 2001, Hsiao et al., 2010, and Razzaque and Sheng, 1998). Bolumole (2001) places logistics outsourcing decisions within a spectrum of options ranging from internal to external. The intermediary options have been categorized in various ways. For example, Hsiao et al. (2010) divide the options between operational decisions (execution) and those of planning and control. For their part, Razzaque and Sheng (1998) suggest a form of division based on the ownership of assets.

Table 1 - Positioning of logistics options in the healthcare sector

Parameters	Internal option (self-distribution)	External option (distributor-driven stockless)
Ownership of distribution facilities	Healthcare network	Distributor
Ownership of inventory	Healthcare network	Distributor
Ownership of transportation fleet	Healthcare network	Distributor
Daily operations	Healthcare network	Distributor
Control	Healthcare network	Shared with the healthcare network

Based on these studies, Table 1 illustrates the positioning of the two major logistics options at end of the spectrum, opening the door to numerous intermediary options. For

example, in Canada, a healthcare network has decided to purchase a regional warehouse. It owns the facilities but outsources its management to a logistics services provider. Another example is that of a healthcare network that signed a stockless agreement with one of its distributors, which handles 80% of its requirements for medical supplies, although another independent firm handles transport. This carrier even handles crossdocking, sorting supplies that are not in stockless mode, and that come from other suppliers. This option is more complex than the traditional stockless approach. These two examples show that healthcare organizations are not restricted to the two extreme options but they can choose to configure their logistics network in order to better respond to their actual and future needs.

CONCLUDING REMARKS AND KEY SUCCESS FACTORS

The options described above, whether internal, external or hybrid should not be considered as a solution to all logistics problems faced by healthcare organizations. In fact, those options are often the result of a gradual and continuous improvement process. The study of a Canadian case of implementing a stockless strategy confirms the importance of cleaning up internal logistic processes beforehand. In fact, for that organization, the stockless option was implemented after four years spent standardizing medical supplies, consolidating the various stores dispersed at various sites, and increasing the service offer of the central store by taking charge of inventory control in the nursing units. The organization had followed the recommendations of the Arthur Andersen (1990) study, which identified a series of actions to be carried out before implementing a stockless option. Adopting a stockless system made it possible for the logistics department of that organization to diversify its offer to some of the organization's other departments that were at that time less well served by the logistics department.

As for the self-distribution option, our case studies again show that processes within the organization must be upgraded. Self-distribution nevertheless differs from distributor-driven stockless in a major way: staff skills must be upgraded (Anonymous, 2012). This observation supports the conclusion of a study by Aberdeen Group (2006), which concluded that the most effective distribution centers, in whatever economic sector, had invested not just in technology but also in the ability of their employees to reap the full benefits of those technologies. Our observations in the Canadian healthcare sector confirm the importance of training: we observed major differences in productivity in the central stores of healthcare organizations, and among the factors identified was the ability of management teams to monitor performance and ensure that instructions were followed.

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