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Advancing Health System Integration through Supply Chain Improvement

Mike Rosser

Collaboration is a key element to success in the provision of sustainable and integrated healthcare services. Among the many initiatives undertaken to improve service quality and reduce costs, collaboration among hospitals in Ontario has been difficult to achieve; however, it is voluntary collaboration that will be vital to achieving transformation of the magnitude envisioned by system leaders.

Successful organizational collaboration has been achieved through the restructuring of supply chain management across hospitals in London, Ontario. This article presents Healthcare Materials Management Services (HMMS) as a case study in organizational collaboration and an innovator in healthcare supply chain management, and articulates its role as a contributing factor in a highly sustainable healthcare system.

HMMS is a joint venture of London Health Science Centre (LHSC) and St. Joseph's Health Care, London (SJHC). Since its inception in 1997, HMMS has successfully consolidated all aspects of purchasing and procurement, inventory and distribution management, logistics and payment across London hospitals. HMMS has realized significant benefits for its joint venture partners, including:

- returning a balanced budget or surplus in every year since its inception;
- reducing annual operating costs for Materials Management

- Services in London (more than \$1.7 million);
- freeing up 40,000 square feet of hospital space;
- reducing the number of hospital inventories from nine to one;
- reducing the number of job classifications from 36 to 3;
- consolidating four different unions and six union agreements into one;
- generating more than \$5 million in contract savings; and
- enabling collaborative partnerships with other hospitals.

Health System Integration in London

Healthcare providers in London, Ontario, have proactively sought and implemented opportunities since the early 1990s to rationalize the provision of services. The most visible and high profile result of this thinking was the merger in 1995 of the University and Victoria Hospitals, resulting in the creation of the London Health Science Centre. As early as 1991 there were discussions among London hospitals to share in the provision of materials management services, with the acknowledgement that there was the potential to improve the quality of service while collectively realizing cost reductions.

Development of a Joint Venture

The creation of HMMS was a lengthy process, from the generation of initial ideas and dialogue in 1991 to the implementation of a joint venture in February 1997. The initiation of HMMS

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hinged upon a number of factors being in place at critical points in time, creating an environment suitable for change. These factors included:

- *The commitment and drive of the leadership of the two organizations to collaborate.* This was the single most important factor driving the initiation of HMMS.
- *An increasing number of patient transfers across hospital sites within the city, facilitating the standardization of supplies and processes for enhanced interoperability between sites.*
- *Vacancies and retirements among key materials management personnel within the two organizations, providing a natural opportunity to rethink roles and restructure operations.*
- *The need to identify cost savings, efficiencies and increased physical space, with the desire to do so in areas that would not adversely impact direct patient care.*

A Joint Venture committee has also been established that guides the direction of laboratories, research and other joint ventures that are in place between the London hospitals. This governance structure allows HMMS to operate as an independent business unit providing responsive service to its partners and affiliates.

Summary of Operations

HMMS's original objectives included consolidation and integration of the functions of Purchasing, Accounts Payable, Receiving and Inventory Management. The original objectives of HMMS can be summarized as follows:

- to consolidate and integrate the functions of Purchasing, Accounts Payable, Receiving and Inventory Management;
- to design a warehousing and distribution solution for the London teaching hospitals with the capacity to service other hospitals on a regional basis;
- to provide service levels that meet or exceed the expectations of internal customers;
- to provide a comprehensive solution for the use of computer technology;
- to provide a proposal for the continued employment of affected employees;
- to provide opportunities for the hospitals to continue to reduce expenses each year by the implementation of cost-effective strategies, automation, workflow analysis and continuous quality improvement; and
- to establish a process for the standardization of supplies and services used within the London hospitals.

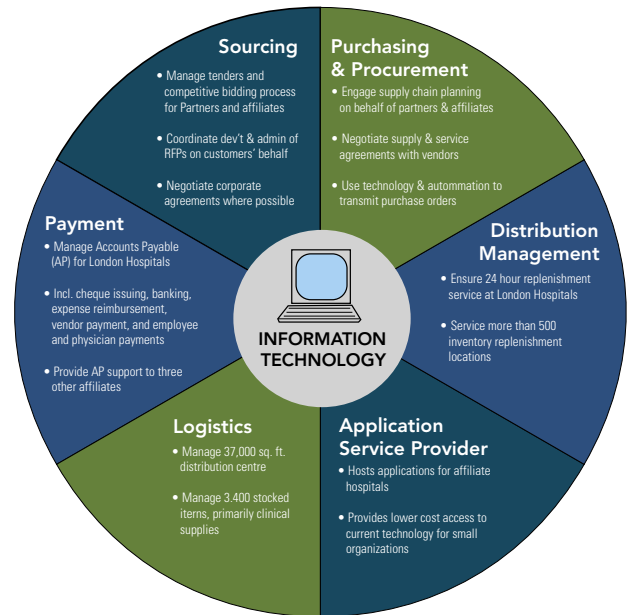
Cost-effective service was provided to the original joint venture partners with limited regional participation; however, HMMS has since broadened its scope of activities to include

significant regional operations, servicing 27 hospital sites and other healthcare organizations with more than 6,500 hospital cost centres.

Scope of Operations

The following graphic provides a summary of supply chain management activities undertaken by HMMS today. These activities have been grouped into five major categories of supply chain management operations: Sourcing, Purchasing & Procurement, Distribution Management, Application Service Provision, Logistics and Payment.

Summary of HMMS operations and accomplishments



Product and Process Standardization: Collaboration in Action

Standardization of products and processes has been a key organizational priority for HMMS since its inception. Specific benefits of standardization that have been realized include:

- *Cost savings:* Reducing the number of different items in inventory, negotiating large-scale service contracts across London hospitals and standardizing processes such as ordering, delivery and accounts payable has resulted in significant savings. Standardization has produced many economies of scale through bulk purchase of fewer different items, rather than low volumes of unique items, along with savings associated with streamlining contract management activities.
- *Patient safety and quality of care:* Standardization of policies and procedures benefits clinical practice by easing the transition between institutions for healthcare staff. It also allows

hospitals to scale up service levels quickly and more easily to react to system changes, crises, etc.

- *Space savings:* Hospital space is very expensive and these efforts have freed up over 40,000 square feet of hospital space in London hospitals. Even greater amounts of administrative, warehousing and clinical space have been made available in affiliate hospital sites.
- *Health system efficiency:* As a result of product standardization, gowns, medical devices, etc., are not discarded when patients are transferred between HMMS partner or affiliate hospitals.

A number of additional aspects of HMMS's operations and management highlight its strategy of collaboration, teamwork and innovation. The outcomes of this initiative have not only resulted in more efficient work processes and strong financial results, but also contributed to creating a unique and strong culture within the organization.

- *Internal collaboration:* HMMS has leveraged its physical separation from the hospital environment to rethink the way that services are provided. The model of integrated and self-directed work teams that has been adopted by the organization has standardized the types of positions and reduced the total number of positions. Human resource accomplishments achieved by HMMS include:
 - zero turnover (excepting retirements);
 - fewer sick days;
 - only two union grievances since inception;
 - fewer job classifications (from 32 to 3 classifications) allowing for greater workflow flexibility;
 - integration of job functions providing more variety within individual jobs, and providing staff with better insight into the full scope of HMMS operations;
 - improved quality of service and an emphasis on continuous quality improvement;
 - improved trust between staff and customers; and
 - fewer union agreements to be negotiated.
- *Use of information technology:* Sourcing, Purchasing/Procurement, Distribution Management, Logistics and Payment are all dependent on information technology. Cost savings and process efficiencies are achievable through implementation of information technology in each of these areas. Use of tools such as on-line catalogues and ordering, electronic data interchange (EDI), bar coding and electronic funds transfer (EFT) allow HMMS and its affiliates to:
 - eliminate "maverick purchasing" or "backdoor purchasing" to maximize product standardization;
 - enhance volume discounts;
 - enhance patient safety by ensuring the availability of proper supplies;

- integrate the six elements of the supply chain continuum from identification of need to payment; and
- analyze purchasing patterns to maximize efficiency and predict future needs.

The latter point will have a particular impact should Ontario experience a major health system event such as a public health crisis: use of supplies can be closely monitored and proactive steps can be taken to avoid potentially critical shortages.

- *Dissemination of new technology:* IT investments have been leveraged in order to become an Application Service Provider (ASP) to affiliate hospitals. This model represents an opportunity for affiliates to acquire leading edge technology for minimal investment. For HMMS, this model provides additional revenues and for affiliates it provides significant cost avoidance and an enhanced level of service compared to their clients.
- *Geographic scope:* Advances in technology have meant that geographic proximity is not necessary. HMMS currently serves clients as far as 230 km away. However, without developing a close working relationship, it is difficult to make significant advances in process and product standardization. A key criterion for success has not been geographic proximity, but rather that a hospital be a good fit with the HMMS model of collaboration and standardization.

Evaluation of HMMS Accomplishments

The following evaluation framework has been developed to measure the accomplishments of HMMS against the organization's strategic and business priorities. This evaluation focuses on four key aspects of HMMS operations that have achieved considerable success and are consistent with the current priorities of healthcare reform in Ontario.

Future Initiatives

Future priorities for HMMS include:

- *Continued investment in IT:* A new information system, installed in 2004, provides HMMS and its partners with integrated Accounts Payable, inventory management, warehouse distribution and purchasing capabilities. The new system is easily scalable beyond HMMS. The systems vendor, McKesson, is currently working with some HMMS affiliates to investigate the potential to expand the system to the remote sites.
- *E-supply chain project:* HMMS, in partnership with six other large healthcare organizations, has been successful in receiving funding through the Ministry of Finance Ontario Buys Supply Chain initiative to further automate current manual processes through the expanded use of e-commerce and other technologies. HMMS's priorities through this program include: the expanded use of EDI transactions (POs, vendor

Summary of HMMS accomplishments				
Supply Chain Component	Cost Management	Collaboration	Accountability	Standardization
Sourcing	<ul style="list-style-type: none"> Monitors market changes by benchmarking product pricing. HMMS budget increases have been less than the CPI. Significant savings achieved as a result of standardization. 	<ul style="list-style-type: none"> Provides supply chain planning leadership, notably during the recent SARS crisis in Ontario. Extends participation in corporate agreements to affiliate hospitals. Acts as a sourcing agent for partners and all affiliates. 	<ul style="list-style-type: none"> Responsible to partners and affiliates to obtain high quality products at low prices. 	<ul style="list-style-type: none"> All standardization efforts to date have been successful. Clients continually seeking additional support in standardization efforts.
Purchasing & Procurement	<ul style="list-style-type: none"> Over 900 supply & service agreements negotiated with vendors. Fewer contracts to negotiate, resulting in reduced cost of contract management. Monitors inventory to identify product "obsolescence" (i.e., slow moving, rarely ordered products). 	<ul style="list-style-type: none"> Provides expertise and buying power to small hospitals. Reduced total effort when making purchasing decisions. Facilitates regional product evaluation and training. 	<ul style="list-style-type: none"> Facilitates open tendering process for: <ul style="list-style-type: none"> Products Supplies Services 	<ul style="list-style-type: none"> Assists partners & affiliates to achieve product standardization. Facilitates standardization of capital equipment. In addition to products, services have been standardized such as shredding, long distance, grounds keeping, fuel, medical gas, etc.
Distribution Management	<ul style="list-style-type: none"> Continually seeking opportunities to reduce inventory items and levels. Electronic stockless inventory systems reduce management and space costs. 	<ul style="list-style-type: none"> Works with partners and affiliates to manage inventory off-site. 	<ul style="list-style-type: none"> Single point of contact for inventory management issues. Achieves inventory fill rate greater than 98%. 	<ul style="list-style-type: none"> Approximately 85% of total inventory standardized. Nearly 100% of common supplies standardized.
Logistics	<ul style="list-style-type: none"> Consolidated transportation and warehouse costs result in reduced total cost and improved productivity. 	<ul style="list-style-type: none"> Service quality and reliability that provides confidence to affiliates to eliminate on-site warehouse and adopt stockless inventory systems. 	<ul style="list-style-type: none"> Measures and reports on service levels annually. Issued \$180 million worth of receipts in 2002/2003 from inventory and non-stock, direct shipments. 	<ul style="list-style-type: none"> Greater number of affiliates streamlines deliveries and adds flexibility to scheduling.
Payment	<ul style="list-style-type: none"> Consolidated AP function has saved staff and space costs. Integration of AP with purchasing has been a key driver of efficiencies. Leverages cash flow to minimize costs. Makes extensive use of EFT; approximately 5,000 EFT payments per month worth between \$7–\$8 M. 	<ul style="list-style-type: none"> Consolidation of AP service and integration of AP function has been key success factor. 	<ul style="list-style-type: none"> Paid nearly \$700 million worth of invoices in 2002/2003. Processes over 55,000 Pos / yr (representing over 175,000 lines). Issues nearly 70,000 cheques per year. Closes the books within four days of month-end. 	<ul style="list-style-type: none"> Common AP processes among London hospitals. Consolidated AP function results in fewer errors, faster turnaround and reduced costs.

catalogues, invoices and EFT), warehouse automation, invoice imaging, web requisitioning and establishing a new offsite clean surgical warehouse.

Lessons Learned

The experience in London suggests that the key success factors for realizing operational and system-wide improvements is through organizational collaboration and commitment to adopting best

practices. Upon reviewing HMMS and its progression, there are a number of factors that have been critical to its success.

1. *Executive sponsorship:* Since the beginning in the mid-1990s, there has been great commitment and sponsorship from the executive of the London hospitals. In particular, the will to collaborate and to see HMMS through to successful implementation and subsequent autonomous operations has been

exemplary.

2. *Strong leadership and management:* The leadership team at HMMS has been a driving force behind the organization's success. Management's continual desire to drive the organization forward through efficient operations and effective partnering relationships (with both customers and suppliers) has resulted in the ability to execute the organization's strategy.
3. *Desire for collaboration among all partners and affiliates:* A strong desire to collaborate on behalf of all participating organizations has proven extremely important to the success of HMMS. The collaboration among the Joint Venture partners alone is not enough – this desire must extend to all participants, as there must be a mutually supportive network in place for all to realize benefits.
4. *Suppliers' openness and willingness to participate:* Suppliers have been instrumental to its success through their collaborative efforts in ensuring that the supply chain is effective. This has been achieved through favourable pricing, electronic integration and, in one case, placing staff at HMMS as a direct support resource.
5. *Support of physician and nursing leaders:* Due to the need for product standardization and the change in on-site inventory management procedures, the requirement for HMMS staff to succeed in working closely with clinicians was great. The clinical staff have been supportive of both goals and acknowledge the benefits to quality of care that have been yielded, such as reduced product waste, product familiarity and fewer stock-outs. The continued support of clinical leaders will be required as new opportunities are pursued.

6. *The development of a unique entity with its own culture:* Although all HMMS employees are contractually employees of SJHC through the joint venture agreement, the HMMS itself has developed its own identity and culture. HMMS staff celebrate successes together, have decreased absenteeism and are continually seeking to improve their operations through customer satisfaction surveys.

Achieving a fully integrated healthcare system is an ambitious objective. Although Ontario is in the midst of a major “transformational” change involving many aspects of the system, there have been many successes on a smaller scale. The experience of HMMS has shown that improvements to quality of care and cost savings are possible through voluntary collaborative action that takes place at a local level in a way that reflects the priorities of each of the partners. The improved cost management, collaboration, standardization and accountability that has been achieved by HMMS have led to both the improved operational performance of participating organizations as well as greater integration among those organizations.

About the Author

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