

Supplier Relationship Management: A Case Study in the Context of Health Care

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Received 1 September 2008; received in revised form 29 April 2009; accepted 1 October 2009

Abstract

Supplier Relationship Management (SRM) plays an important role in the reduction of costs and the optimization of performance in industrial enterprises. Despite enormous investments in innovation, the health care sector has not experienced fundamental change yet. However, increased market dynamics and the implementation of economic principles will force health service providers to optimize cost structures as well as effectiveness and efficiency of business relationships. This paper reviews the current state of the art in the field, translates and amends the current findings for the health care context, and presents a case study illustrating the impact of the implementation of SRM principles in a leading Swiss hospital.

Key words: Business Networking, E-Business, E-Collaboration, E-Procurement, Health Care, Supplier Relationship Management, Supply Management

1 Introduction

The adoption of information and communication technology (ICT) in health care is currently seen as an opportunity to improve not only effectiveness, efficiency, and quality of health services but also the transparency of the economic activities and the availability of information in real time [65]. Despite enormous investments in innovation and the magnitude of the opportunities for innovators, the health care sector has not experienced fundamental change yet [23]. However, the pressure to achieve effectiveness and efficiency is set to increase significantly as in many countries economic principles, such as fixing rates for medical treatments or charges for medical registration, are introduced in order to reduce health expenditures and enhance the competition among the health care providers.

Although labor costs constitute the major share of the total costs of a medical treatment, there is still a major economic potential in improving expenditure on materials and services [15], [25]. One source to reduce costs and enhance service delivery can therefore be found in the sophisticated management of the relationships with suppliers, commonly referred to as supplier relationship management (SRM) [30]. For doing so, a wide spectrum of managerial tools and technological aids have been developed, mainly in highly competitive sectors e.g. automotive or engineering [8], [49], [53]. However, the not reflected usage of these instruments is inadvisable since health care has considerable differences compared with the mentioned sectors (e.g. extensive governmental control, permanent obligation for service delivery, the structure of a seller's market).

Nevertheless, in health care research and practice the concept of SRM is not paid much attention yet. The weak positioning of the purchasing department in the value chain of health service delivery and resulting low attention on the part of the hospital's board of directors makes it difficult to promote the purchasing function from a pure cost driver to a respectable facilitator of health service delivery that contributes to revenue increases, knowledge acquisition, and added value to the organization. Accordingly, hospital buyers were just expected to attain the best price for the needed goods. Therefore trust between the buyer and the supplier is weak and the relationship is oftentimes adversarial. Due to the onward 'marketization' of health care, open-minded hospital managers expect that the hospital procurement department will increasingly contribute to revenue gains and to knowledge acquisition in future [57]. In order to achieve this goal, the hospital purchasing departments have to better integrate internal consumers as well as the external suppliers. Hence, cooperation (trust and commitment), coordination (processes and work practices), and communication (information systems) will be the key concepts to implement the required change. However, as the current research is mainly focused on industrial enterprises, it is the aim of this paper to provide an actual but sector-specific discussion of the subject matter and present first experiences of a SRM implementation project of a Swiss hospital. We believe that a better understanding of the meaning and perspectives of SRM could improve collaboration between internal and external partners (purchasing department, medical clinics, suppliers, and trading partners) and possibly enhance the adoption of SRM concepts and technologies.

The paper is organized as follows: In Section 2, we will refer to the state of the art of related research in the field in order to exemplify our understanding of SRM. As the great part of the literature about SRM is focused on industrial organizations, the concept is put into the context of health care in Section 3. In Section 4, a case study is presented to demonstrate the impact of SRM on the business relationships, processes and IT of a health care organization. Finally, in Section 5 we will give a short summary on the insights, which we have gained from our case study and offer some suggestions for further research.

2 What is Supplier Relationship Management?

Supplier Relationship Management or *Supply Management* (in the following we will use both terms interchangeably) is a comprehensive approach to managing an organization's interactions with the firms that supply the products and services it uses. It has its origins in the late 80's basing on the seminal work of Dwyer et al. [14] about *relationship theory* and of Davenport and Short [13] about *process re-design*. Today, software vendors who developed a wide range of ICT functionalities to support SRM activities give new impetus as well. The immediate objective of SRM is to streamline and make more *effective* the sourcing processes between an enterprise and its suppliers. Indirectly, SRM is also aiming at *quality-related* improvements of information, products, services, and work force capabilities. A common agreed definition what SRM exactly comprises does not exist to date. Consecutively, some sample definitions – from academia and practice – are given below:

- "Supplier relationship management is the process that defines how a company interacts with its suppliers. As the name suggests, this is a mirror image of customer relationship management (CRM). Just as a company needs to develop relationships with its customers, it also needs to foster relationships with its suppliers [...] The desired outcome is a win-win relationship where both parties benefit." [59]
- "SRM is understood as the sourcing policy-based design of strategic and operational procurement processes as well as the configuration of the supplier management." [2]

- “Purchasing and Supply Management is defined as a strategic, enterprise-wide, long-term, multi-functional, dynamic approach to selecting suppliers of goods and services and managing them and the whole value network from raw materials to final customer use and disposal to continually reduce total ownership costs, manage risks, and improve performance (quality, responsiveness, reliability, and flexibility).” [28]
- “SRM includes both business practices and software and is part of the information flow component of supply chain management (SCM). SRM practices create a common frame of reference to enable effective communication between an enterprise and suppliers who may use quite different business practices and terminology. As a result, SRM increases the efficiency of processes associated with acquiring goods and services, managing inventory, and processing materials.” [50]
- “SRM [...] refers to any supplier-facing business practices which are enabled by collaborative software and which allow companies to work with their supplier base for mutual success. Primarily, SRM tools have been developed to reduce the total cost of ownership (TCO) for procured goods, while creating competitive advantage for an organization through deeper relationships with its suppliers.” [18]

Looking at the above-mentioned definitions it is possible to determine that there is a dichotomy of understanding of the concept of SRM: A *management-oriented* definition that concentrates on the aspects of collaboration as well as coordination and a more *technology-focused* examining the new possibilities of electronic communication (Table 1).

Table 1: Perspectives on Supplier Relationship Management

	Management-oriented view	Technology-focused view
<i>Conceptual foundations</i>	<ul style="list-style-type: none"> • Relationship theory • Social network theory 	<ul style="list-style-type: none"> • Process re-design • Transaction cost economics
<i>Main focus</i>	<ul style="list-style-type: none"> • Proactive development of relationship between an organization and its suppliers • Design, implementation and control of cross-organizational relationships to suppliers • Continuous advancement of the ‘lived’ partnership to strategic suppliers • Exchange of improvement ideas between buyer and supplier 	<ul style="list-style-type: none"> • Coordination of procurement process and monitoring of quality consistency of different suppliers • (Technically) Integration of suppliers in procurement processes • Continuous analysis and control of procurement processes and supplier performance • Automation of all procurement activities between the enterprise and supplier
<i>Key objectives</i>	<ul style="list-style-type: none"> • Enhancement of co-operation and quality of information flows • Security of supply and leverage through negotiation of better deals from suppliers • Continuous improvement with suppliers by encouraging innovation • Compliance with contracts and regulations 	<ul style="list-style-type: none"> • Better risk control through better information flows • Lean processes and consolidation of supplier base • Reduction of cycle times and process costs and better value for money (TCO) • Improvement of process quality
<i>Exemplary sources</i>	[9], [21], [40], [44], [45], [58]	[2], [4], [24], [55]

For the further use of the term we define SRM as a comprehensive approach to enhance *cooperation* (business relationship level), *coordination* (process level), and *communication* (information systems level) between the enterprise and its suppliers in order to continuously improve efficiency and efficacy of collaboration and concurrently enhance quality, security, and innovation.

3 Supplier Relationship Management in Health Care

Compared to industries with intense competition like for example automotive or engineering, SRM is not paid much attention to health care research and practice [20]. Hence, the question arises why health care is dissimilar from other sectors and how is SRM affected by these?

3.1 Cooperation in Industry

The activity of an enterprise involves *cooperation*, both voluntary and involuntary, active and passive, of numerous and diverse constituents [42]. Cooperation between business units is approached on the *business relationship level*. Business units are economic units, such as e.g. corporations, divisions, national subsidiaries, profit centers or small and medium-sized enterprises, which are responsible for profits and operate within the market economy [38]. Depending on the business unit, different types of relationships exist. These normally can be used as differentiation criteria for the diverse relationship management approaches (Figure 1).

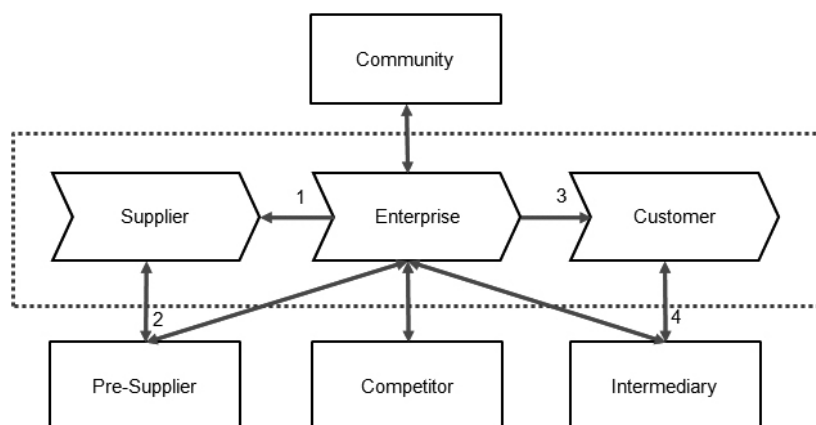


Figure 1: Cooperation relationship types

As described above, SRM primarily focuses on the improvement of the relationship between the enterprise and its immediate suppliers (relationship type 1). An enlargement of SRM is the concept commonly referred to as supplier network management (SNM), which also incorporates pre-suppliers (relationship type 2). CRM (relationship type 3) often is seen as the opposite of SRM given that the customers and not the suppliers are in the center of interest [59]. Similar to SRM, there also exists an extension of CRM called partner relationship management (PRM), which principally concentrates on the intermediaries of an enterprise (relationship type 4) [44].

Primary means to prepare, establish, engage and control a supplier cooperation relationship are:

- Sourcing strategy, i.e. a plan, ploy, pattern, position, perspective how to connect with internal and external partners for sourcing purposes [34].
- Sourcing agenda, i.e. a specification of rights and liabilities how to act in case of relationship issues [56].
- Supplier and purchasing portfolios, i.e. models to determine the suppliers' capabilities and the demand of the enterprise [7], [26], [37], [60].
- Trust, i.e. a human and personal sense of shared destiny or mission with the suppliers [22].
- Commitment, i.e. formal and informal contracts (e.g. outline agreements or verbal arrangements) [22], [56].
- Target system, i.e. a specification of the aims of the supply management of an enterprise or a specific relationship to a supplier.

3.2 Cooperation in Health Care

According to Herzlinger [23] and Porter and Olmsted Teisberg [41] health care is considered to be different from most other industries due to the high level of regulation, the high proportion of governmental investment, the associated low pressure in respect of effectiveness and efficiency of state-subsidized health care organizations and the lack of orientation towards customer benefit. As a consequence of that, the health care sector shows a relatively underdeveloped information system structure [39]. However, in order to provide optimal health service delivery there is a long-standing practice of including information beyond the traditional boundaries of a single health care organization [52]. Furthermore, there is an imminent obligation for cooperation in order to comply with the requirement of both, internal (e.g. doctors, pharmacists, nurses) and external stakeholders (patients, governmental agencies, suppliers).

The cooperation relationship with suppliers normally is subject to a variety of exogenous and endogenous influencing factors [31] (Figure 2):

- *Regulatory setting:* The health care market is completely administered by governmental agencies - both professional (e.g. admission for pharma-related professions) and commercial (e.g. assignments to render certain services). Governmental regulations and policy constrict the freedom of action [43].
- *Market structure:* Health care shows, in contrast to other industries, a typical seller's market structure [10]. There is still a strong dependency between producers and customers [64]. The constitution of collaborative processes is therefore highly complex.
- *Technological advancement:* Like in other sectors, technology is advancing quickly. This facilitates new possibilities for cooperation (e.g. vendor managed inventories, just-in-time ordering and delivery, collaborative procurement planning). However, as health care is rather underdeveloped in terms of its IT infrastructure and health care personnel are less accustomed to work with new technologies, there is a need of acquiring not only technology but also expertise to handle it.
- *Strategic positioning:* Most sectors address an unambiguous and homogenous customer segment, but health care involves variety, including clinicians, payers, government, service providers, and users [3]. The health care organization's strategy and thereof derived sub-strategies (e.g. cooperation strategy) have to conform to the needs of every customer segment. However, to reduce complexity, variety of services and products has to be reflected critically.
- *Employee behavior:* Perceptions, feelings, and face-to-face contact are extremely important to the success of any change effort [63]. Thus, social networking with suppliers is an important part of relationship management.
- *Organizational structure:* Whereas management is unified in most sectors, health care has clinical and administrative reporting lines with sometimes very different leadership philosophy and target systems [3]. This division normally also has an influence on how to do business with suppliers. As medical staff is normally more inclined to assess the supplier relationship according to the quality of the delivered products, buying agents typically are more focused on the price performance ratio.

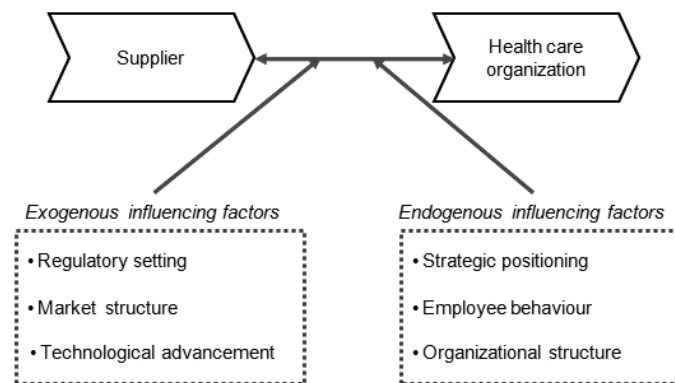


Figure 2: Characteristics of supplier relationships in health care

3.3 Coordination and Communication in Industry

Coordination is approached on the *process level*. Processes (i.e. sets of partially ordered tasks and thereof deduced atomic activities [11], [29]) build the basic building blocks for the implementation of a cooperation strategy [38]. Coordination between the processes ensures that the sourcing activities are interconnected and diaphanous. The granularity of a sourcing strategy would appear to be too coarse-grained for deriving concrete procedural instructions for the design and implementation of sourcing processes. In accordance with Rüegg-Stürm [48] three types of processes exist: business processes, support processes and management processes. Business processes include all tasks and activities to guarantee the supply of goods (e.g. ordering, settlement and shipment). On the other hand, support processes focus on the allocation of the purchasing department's infrastructure and on the consequent assistance of efficient and effective business process delivery (e.g. training of staff, IT-support). As a consequence, support processes only generate indirect value. Management processes are needed for the organization, governance and development of the supplier relationship. For instance, in the short term, management processes deal with the control of every-day sourcing activities (e.g. ordering of standard goods). In the long term, management attendance is needed for the strategic alignment and normative orientation of the purchasing department and the

supplier portfolio. Reviewing the current literature in the area shows that the processes used for SRM are given unequal emphasis in terms of depth and breadth (Table 2).

Table 2: Processes of supplier relationship management

	Processes of supplier relationship management			
<i>Exemplary sources</i>	[51]	[44]-[45]	[16]	[2]
<i>Business processes</i>	<i>Information phase:</i> <ul style="list-style-type: none"> Information gathering Offer submission <i>Agreement phase:</i> <ul style="list-style-type: none"> Negotiation <i>Settlement phase:</i> <ul style="list-style-type: none"> Secondary market transactions Fulfillment of contract 	<i>Initiation phase:</i> <ul style="list-style-type: none"> Supplier selection Supplier appraisal <i>Design phase:</i> <ul style="list-style-type: none"> Negotiation <i>Stabilization phase:</i> <ul style="list-style-type: none"> Team building Social networking 	<i>Strategic sourcing:</i> <ul style="list-style-type: none"> Information and search Negotiation and agreement Engagement and configuration <i>Operational procurement:</i> <ul style="list-style-type: none"> Ordering and shipment Delivery and completion 	<i>Strategy building:</i> <ul style="list-style-type: none"> Development of targets Strategic analysis Strategy formulation Strategy implementation <i>Strategic sourcing:</i> <ul style="list-style-type: none"> Preparation Initiation Acknowledgment <i>Operational sourcing:</i> <ul style="list-style-type: none"> Determination of demand Ordering Settlement
<i>Management processes</i>	<ul style="list-style-type: none"> Not considered 	<i>Coordination phase:</i> <ul style="list-style-type: none"> Monitoring and controlling Change management Conflict management 	<i>Operational and strategic monitoring:</i> <ul style="list-style-type: none"> Monitoring and controlling 	<i>Not classified:</i> <ul style="list-style-type: none"> Monitoring and controlling Incentive management
<i>Support processes</i>	<ul style="list-style-type: none"> Not considered 	<ul style="list-style-type: none"> Not considered 	<ul style="list-style-type: none"> Not considered 	<i>Not classified:</i> <ul style="list-style-type: none"> Human resources development

As we believe that SRM consists of both *technical* and *social* networking, a holistic approach is needed (Figure 3). On the one hand, our process framework for SRM consists of the prevalent business and management processes to handle supplier relationships:

- *Governance*, i.e. development and implementation of a sourcing strategy, monitoring and controlling of the defined targets and work practices, and reaction and change of plans in case disruption.
- *Strategic sourcing*, i.e. initiation, negotiation and stabilization of a supplier relationship.
- *Operational procurement*, i.e. determination of the needed goods, ordering the requested goods, and settlement of trading.

On the other hand, the framework includes supportive processes that are crucial for social and technical networking:

- *Human resources*, i.e. recruiting of new professionals, development of the present staff, evaluation of the capabilities and performance of the present staff, and reward in case of satisfactory performance.
- *Infrastructure and IT-Services*, i.e. documentation of enterprise architecture, alignment of IT capabilities with business needs, optimization of information and material flows and renewal of the infrastructure.

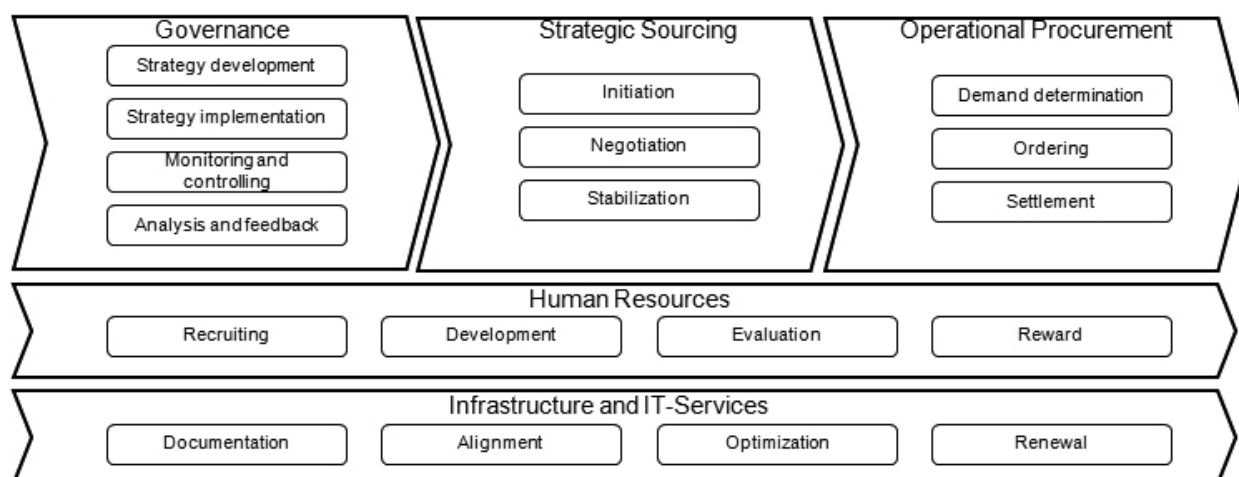


Figure 3: Holistic process framework for supplier relationship management

Communication is approached on the *information systems level*. Computer-based information systems are used to process and disseminate information within and between organizations and thus support the accomplishment of the defined processes [27], [46]. However, people are still needed to make sense of the processed data and to 'integrate' the information of non-digital channels (such as voice communication by telephone or typing of hand-written forms).

For CRM different types of computer-based information systems (e.g. analytical, collaborative and operational) exist. Comparably, there is also a differentiation in SRM (Figure 4). *Analytical SRM* (white rounded squares) aim at storing, analyzing, and applying knowledge about suppliers and personnel dedicated to manage the supplier's relationship. For this, typically performance management and decision support tools (e.g. business intelligence, on-line analytical processing, statistical tools, data warehousing, data mining) are used. The purpose of *collaborative SRM* (light gray rounded squares) is to improve the quality of supplier collaboration, and, as a result, increase supplier performance and reliability. E-Collaboration tools (e.g. collaborative forecasting and planning), E-Contract management tools, E-Auctions, E-Tendering, and E-RFx tools (e.g. electronic request for information, quotation, and proposal) fall into this category. *Operational SRM* (dark gray rounded squares), commonly referred to as *E-Procurement*, includes all necessary tools for ordering and conclusion of a contract such as payment, invoice verification. Typical examples are plan-driven purchasing and desktop purchasing tools (e.g. E-Catalog, E-Payment, supplier self-service, and supplier portals). Alongside analytical, collaborative, and operational SRM, other tools are needed (dashed rounded squares) to support activities, which are not in the core of procurement. For instance, search engines to retrieve all kind of internal and external information related to sourcing, inventory control systems to build the crucial bridge to the logistics department and requester of goods, business process modeling and enterprise architecture solutions for visualizing, simulating and analyzing different structural aspects of the purchasing department, personnel administration systems for managing workforce related information, finance and controlling systems to define targets and supervise the achievement of objectives, and enterprise content management systems to dispense all kind of documentation.

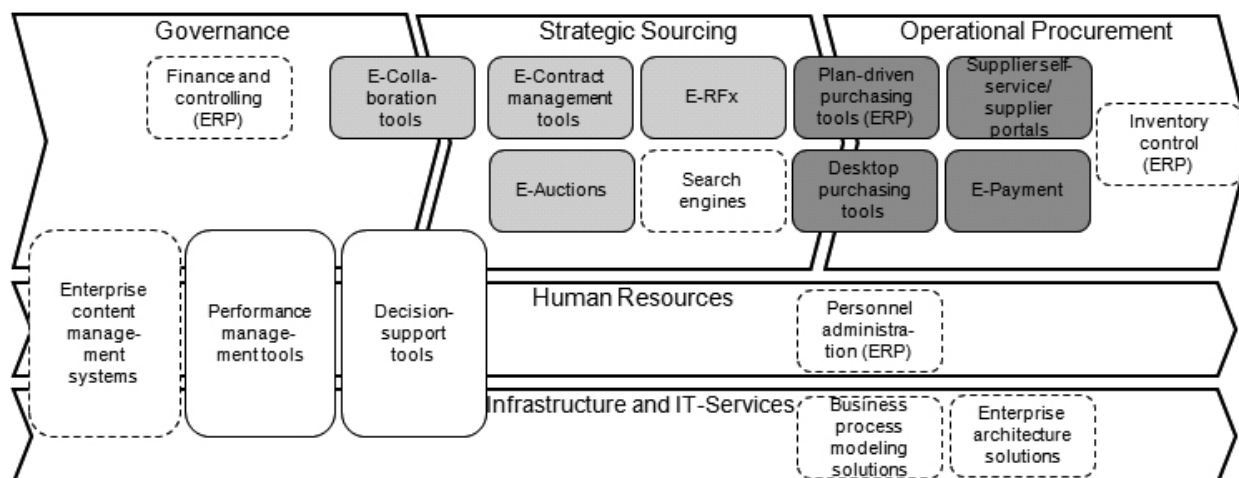


Figure 4: Information systems for supplier relationship management

3.4 Coordination and Communication in Health Care

According to a survey of the Aberdeen Group [1], 60% of the responding companies of the industrial sector report that improving the way they connect to, coordinate with and monitor suppliers is currently among their top five supply chain priorities. However, the situation in health care is different since procurement, in most instances, is seen as cost driver. The review of empirical studies, journal and newspaper articles, and additional interviews with health care professionals in the field of health care supply management yielded to the following delineation of the status quo of SRM adoption in health care.

- *Strategic sourcing:* The price is still the most important criterion for hospital buying agents for the establishment of a supplier relationship [20]. Surprisingly, product quality and reliability of suppliers seemed to be much less relevant. However, as the short-term price advantages for most material groups of a hospital are largely exploited other criteria for the selection of suppliers will gain in importance [36]. To generate mid-term and sustainable long-term cost-savings hospitals would need to increase networkability by bundling their demand in purchasing associations, establishing (with other hospitals and health service providers) a cross-organizational category management, thus optimizing the number of suppliers and product portfolios [17]. Introducing the mentioned business concepts in hospitals will not only have an impact on financial issues but also have a fundamental influence on the IT-architecture of a hospital (e.g. increased use of collaborative tools, cross-organizational integration of applications).
- *Operational procurement:* Because of a broader availability and acceptance of operational procurement tools (e.g. e-payment, desktop purchasing), the diffusion of these kinds of tools seems to be more common than the strategic sourcing ones. According to the German Association for Medical Technology [20], 38 per cent of the German hospitals already implemented an electronic delivery order and 35 per cent an electronic invoice. Nevertheless, this ratio seems to be marginal when comparing with the aviation industry where 85 per cent of the organizations actively use e-procurement in day-to-day business. As cost-savings still are the major drivers for change projects in health care, the use of operational procurement tools is set to increase significantly in the next years.
- *Governance:* Besides the strategic and functional activities in procurement there is also a need for tools to monitor and control the suppliers' and buying agents' performance. Therefore actual and accurate information about prices, delivery times, quantities and quality aspects build the basic input parameters for performance measurement. Hence, data quality management is becoming increasingly important when establishing SRM. While in health care improved data quality is mostly linked to better management of health plans and improved treatments, it also can help to increase competitiveness of a hospital (e.g. for establishing relationship marketing [61], for decision making about cost-effectiveness of treatments [62]). Until now, little has been done by the hospital purchasing department managers to implement performance measurement and governance principles in procurement. However, the discussion with the health care professionals showed that the awareness of governance issues is changing [33].

4 A Case Study in the Context of Health Care

Little is known about the impact of SRM on health care organizations since its implementation is still in the fledgling stages. Therefore the case study at hand simply presents a first field report. Nevertheless, it can help to get a better understanding of the importance of SRM in day-to-day business of a health care organization.

4.1 Materials and Methodology

Case study research can be used to provide descriptions of phenomena, develop theory, and test theory [12]. According to Yin, case study can be defined as "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" [66]. Case study research is widely used and is particularly appropriate for the study of both, *social* as well as *technical* phenomena such as the development, implementation and use of information systems and IT within organizations [5], [35], [54]. We used it in an *exploratory* manner for investigating the possible impact of SRM, i.e. cooperation, coordination and communication between suppliers and health care organizations. To obtain the required data, multiple expert interviews were conducted. In addition, personal observational field notes and secondary material (e.g. process descriptions, technical specifications provided by the surveyed hospitals) were used in order to draw some conclusions for its further development in the sector. Initial findings have been published in German at [30]. However, this contribution extends the previous work by referencing and translating current findings of industrial research in the field and by suggesting generic practices the hospital supply managers found essential for implementing SRM in the health care context.

4.2 Scope of the Case Study

As discussed above, the concept of SRM affects many different processes around the sourcing and provisioning of materials in a hospital (Figure 3). However, as it is impossible to tackle all the respective changes at the same time (e.g. appraisal of suppliers, contract and risk management, settlement of orders), a clear delineation of the surveyed implementation project is needed. The focus of the presented case study is thus on two topics:

1. Inter-organizational exchange of product information as a preliminary form of strategic sourcing (corresponds to the process of initiation in Figure 3), and
2. Optimization of the internal ordering procedure as a crucial task of operational procurement (corresponds to the process of demand determination in Figure 3).

The first aspect was selected due to the fact that the availability of timely and accurate information about purchasing conditions of other hospitals strongly enhances the bargaining power of buying agents and therefore can be seen as an enabler for the transformation of the current structure of an archaic seller's market to a more competitive buyer's market (cp. Section 3.2). The second aspect is a common issue, which also can be found in other sectors of economy. The emphasis therefore is on the demonstration that existing solutions of other sectors can also favorably be applied in the health care context (cp. Section 3.3). On the other hand, the optimized handling of internal orders can be seen as an important contribution of the hospital's purchasing department to enhance the overall quality of health service delivery, since a medical treatment without the proper material and drugs can significantly affect the therapy of a patient.

4.3 The SRM Project

With an average of 31.000 inpatient and 161.000 outpatient treatments and about 4.800 employees the subject under study is one of the largest hospitals in Switzerland. Every day, the purchasing department handled 950 orders either by phone or per fax. Therefore the great part of a buying agent's labor time was used to (manually) process these orders. In 2006, the purchasing department manager decided to introduce the concept of SRM as an organizational and technical response to the actual drawbacks. Thereby two major objectives should be attained:

1. Cost of supplies (approximately 93 million Euros annual material costs a year) should be reduced,
2. Procurement and logistical processes should be optimized across the different clinics (from ordering to in-house delivery).

4.3.1 Changes on the Business Relationship Level

In the past, the purchasing department of the surveyed hospital was concentrated on the independent optimization of cost structures and relationships to its major suppliers. Relationships to other hospitals and suppliers were informal, unclear, and inefficient. As price margins for a single hospital are constantly declining, a purchasing association with three other hospitals, comparable in size and maturity level, was founded in fall 2006. It quickly became clear that for the conjoint negotiation a standardization of and concentration on selected products and suppliers was needed. On the basis of a product portfolio, the supply managers of the four hospitals decided to center on the procurement of therapeutic and diagnostic equipment in a first step (Figure 5). In a second step, the procurement of other commodities will follow (in Switzerland the provisioning of pharmaceuticals is ceded to the hospital pharmacists in most instances; for more information please refer to [32]).

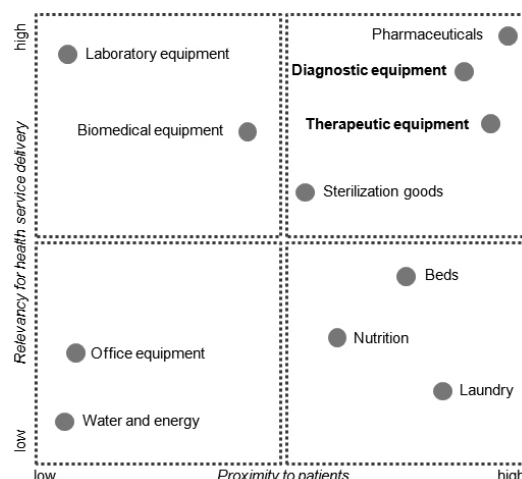


Figure 5: Example of a hospital's product portfolio for demanded goods

To have a better basis for negotiation, the information needs with reference to products, prices, and suppliers were defined. However, in order to facilitate comparison for the conjoint determination and pooling of the demand, a common material and supplier classification was needed. It was obvious that the development of a proprietary classification will cause a lengthy and disharmonizing debate about material denominators, supplier evaluation properties etc. and boost the cost for deployment and maintenance to a not justifiable extent. Therefore the supply managers decided to participate in an electronic marketplace, which categorized items neutrally, and free of manufacturer-specific terms (Figure 6). In doing so, information about product prices, trade allowances, and consumption became transparent and is now actively being used for negotiation with suppliers. However, as the used electronic marketplace only facilitates electronic ordering not electronic exchange of information between the hospitals, this is only seen as a first step towards a conversion from a seller's to a buyer's market.

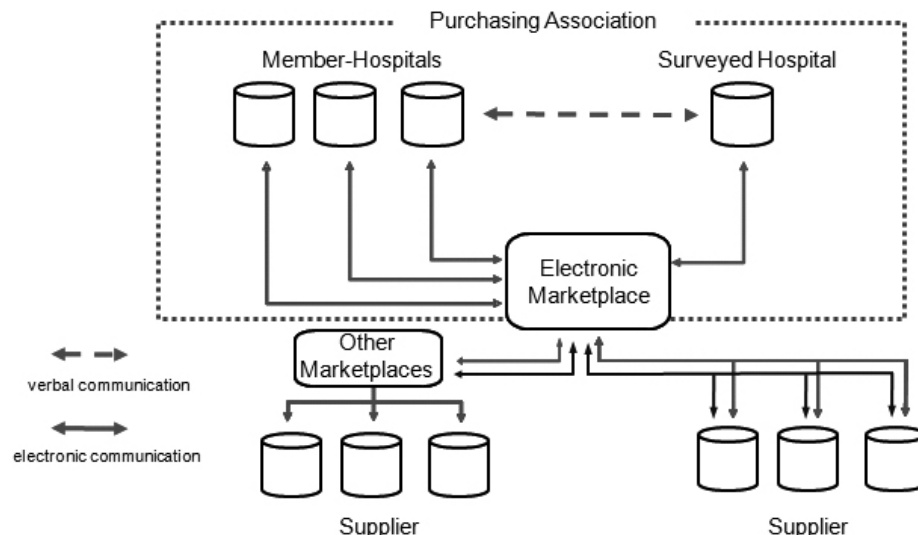


Figure 6: Structuring of business relationships by the use of an electronic marketplace

4.3.2 Changes on the Process and Information Systems Level

In the beginning of the project, ordering of materials implied manual processing of requisitions, paper shuffling and little information about delivery cycle times. Hence, with the aim of optimizing efficiency of the overall logistical processes two major deficiencies were addressed.

First, to ease the buying agents of doing unprofitable work (e.g. to manually procedures for the incoming paper-based orders), the ordering process was intended to be best possible automated (Figure 7). For this purpose, a desktop purchasing tool was implemented, which contained all product data with the former, hospital-specific denomination of the items (not the new classification scheme of the electronic marketplace), since this was one of the key requirements to ensure the acceptability of the solution. To guarantee the consistency of the neutral as well as the hospital-specific product data, a synchronization mechanism between the two databases was needed. On the other hand, simplicity of handling was another essential requirement. For this reason, the whole ordering procedure on the part of the wards had to be effected on a simple web browser. By using this tool the search for determined products was significantly simplified and extensive add-on information about products and suppliers provided. As a result, manual ordering was cut down to a minimum. After the implementation of the tool more than 80 percent of the in-house orders were processed electronically.

Second, to enhance the overall logistical processes an interface to the materials management system was implemented. As the incoming goods are registered in the ERP, an important feedback loop for the purchasing department was automated which formerly was done by hand. Due to better information about the reliability of suppliers, stock management and inventory control was improved and the delivery of the needed goods was accelerated, too. However, another essential feedback loop – the factual use of the delivered material within the medical treatment – still remains unconsidered.

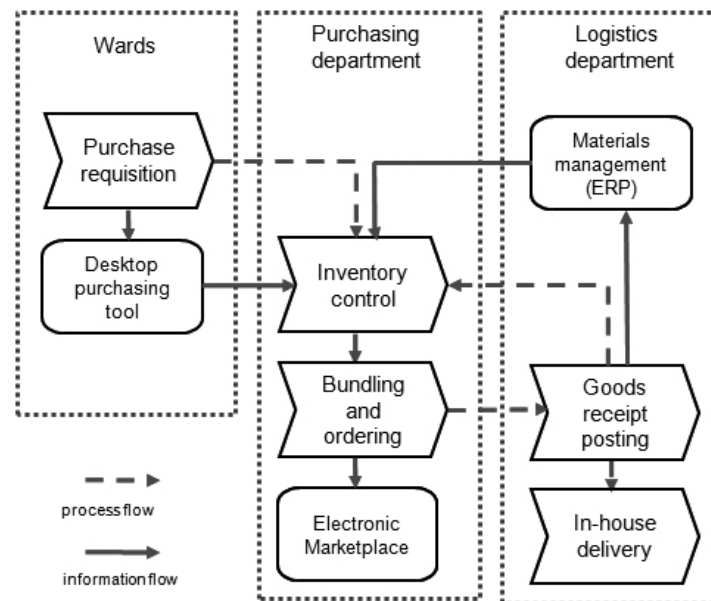


Figure 7: Process and information flows after SRM project

4.4 Practical Implications

The prior described findings from the case study show that hospitals are able to apply industrial supply management practices and tools. Further evidence from the qualitative interviews revealed that the following practices significantly influenced the project on the business relationship level:

- **Sourcing strategy:** One key for success is a thorough analysis of the market in order to understand evolving opportunities and threats as they relate to the strengths and weaknesses of the health care organization. Before new relationships with hospitals and suppliers are established, market power, potential growth rate, profitability, and cost structure as well as the internal demands have to be explored, and shaped in a concise and clear sourcing strategy.
- **Performance management:** Public sector organizations are differentiated in comparison with their commercial counterparts in the private sector. "There is no profit maximising focus, little potential for income generation and, generally speaking, no bottom line against which performance can ultimately be measured" [6]. Therefore performance management in health care is not only aiming at the systematic generation and control of an organization's *economic value* but also at the optimization of the *efficiency and effectiveness* of service delivery [33]. Along with the sourcing strategy, also clearly defined target systems (e.g. activity-based costing, learning and growth measures, supply department reputation) and governance policies are needed (e.g. what happens in case of a breach of contract on the part of a supplier), since an increased efficiency of a supplier relationship is always in the line with a stronger embedding of the supply network.

With respect to the process and information systems level, the following practices impacted the success of the SRM implementation:

- **Business/IT-Alignment:** After having defined the strategic conditions of the hospital's supplier relationship management, it is important to examine the processes and the infrastructure, which supports the achievement of the strategic targets. For an innovation driven climate in which information and communication technology becomes a *strategic* enabler for tangible (e.g. reducing process cycle-times and costs of sourcing processes) and intangible (e.g. improving quality of supplier master data) benefits, the extensive exchange of ideas between the purchasing and the IT department is extremely important as well as with external software vendors, e-marketplace operators etc.
- **People capabilities development:** A holistic improvement of SRM not only requires the adaptation of processes and infrastructure ("hard change") but also to review the corporate culture ("soft change"), since the effectiveness and efficiency of a health care organization strongly depends on the ability of the human resources [47]. As a high degree of flexibility, openness and agility of buying agents, nursing staff, logisticians etc. is needed, a systematic training of the people capabilities is required. However, this cannot be developed in the short run. Therefore instruments that convey the required change have to be planned, implemented and communicated already at an early stage.

5 Conclusion

Although today's reason for implementing SRM is mostly driven by cost-savings and efficiency increase propositions, substantial improvements in efficacy and quality in different areas of health care organizations can be achieved. The described case study shows a first attempt for doing so. By exchanging product and supplier information with other hospitals, the purchasing department under study has made the first move to establish strategic aspects of SRM. The availability of comprehensive and up-to-date product information can definitely enhance the bargaining power of the hospital's purchasing department. The European Commission reported that hospitals which had experience with ICT-supported sourcing had sustainable cost reductions (51% said that the perceived effects were fairly positive, 17% said that they were even very positive) [15]. However, a more detailed study of the effects resulting from this better information basis has to be conducted in future research.

In addition, by improving the in-house ordering procedures, sustainable benefits in terms of efficiency, efficacy and quality of the operational procurement was obtained, since 80% of the former paper-based orders are now processed electronically. As in health care the perceptions of the various actors are extremely important to the success of any change effort [63] and industrial approaches to procurement are rather unusual [19], a key success factor when implementing the new online product catalog was its simplicity (i.e. using web technology) and the utilization of the well-known, hospital-specific denomination of the items instead of a new terminology.

The insights we have gained by our research should be critically reflected by considering the limitations of our approach – a single, exploratory case study of a public-financed hospital – in order to be able to draw the right conclusions and recommendations for future research efforts. However, to understand the future direction of SRM in health care, researchers need to investigate into more detail today's pressing health care business and health care policy issues, trends in business models of other sectors (e.g. silent processes), emerging technologies (e.g. chip implants), and social and ethical progress (e.g. privacy and social networks). Thus, building on the results of this contribution, future research needs to be dedicated to deliver and evaluate capable models, methods and instantiations in order to give guidance how to substantiate the implications drawn from the case study.

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