

Supply Chain Management in Hospitals - Impetus from Organizational and Behavioral Theories

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The purpose of this paper was to discuss a theoretical foundation for supply chain management (SCM) in hospitals based on organizational and behavioral theories with the aim of explaining how hospitals can structure and manage their supply chain (SC). The discussed theories help to better understand SCM in hospitals. The market-based view enables the analysis of the competitive environment. The resource-based view helps to develop an understanding of what the key resources are. Network and stakeholder theory give guidance on how to identify most relevant partners. As relationships between different actors exist by nature, principal-agent theory helps to reduce agency-costs.

INTRODUCTION

Since healthcare has a profound impact on our quality of life, it matters more than any other cares or services. Regardless of its importance to public welfare and personal wellbeing, its affordability has been in doubt for a number of years due to rapidly rising costs across the world (Min, 2014). Rising life expectancy and growing prosperity lead to increased consumption of medications, health treatments and medical care. The healthcare market confirms this trend as the health expenditure has risen steadily in recent years (Austrian Chamber of Commerce, 2013). Challenges, such as the reduction of costs while expecting raised quality of treatment, ever-increasing competition involving comparison of services, as well as limited financial means, and legal as well as political factors of influence spurred the national and international debate over sustainability of affordable healthcare. This is especially challenging as the healthcare sector involves many players (government, employers, insurers, providers, patients, pharmacies, distributors, wholesaler...) and the presence of these many players leads to a high probability of conflicting interests, miscommunication, fragmentation and a lack of coordination which creates inefficiencies resulting in low patient value (Colletti, 1994). Gravier and Farris, 2011 highlight these inefficiencies by showing that 31 percent of the costs occur to simply process health care administration. Another statistic estimates that up to 46% of a hospital's total spending relies on logistics related activities (Landry & Philippe, 2002), and that nurses spend 15 percent of their time on logistics-related activities rather than on caring for patients (Chapman, et.al., 1998).

One alternative in order to be able to cope with these challenges and to avoid inefficiencies is to adapt advancements in business supply chain management (SCM) to healthcare supply chains. This may offer opportunities to improve efficiencies, enhance customer service, break the hidden silos among the different healthcare players, harmonize their conflicting interests and reduce costs while saving lives (Gravier & Farris, 2011).

Healthcare supply chain management is an emerging field within SCM and reasons to develop principles and practices are similar to the three reasons in humanitarian supply chain management (Tabakalar, et.al., 2015). First, healthcare supply chains allow for the exploration of contextual factors that shape the conditions for an effective flow of patients and materials. Second, research on healthcare supply chain management has increased the awareness that SC principles are not limited to commercial purpose only. Third, borrowing and applying theories from other disciplines helps to better understand SCM in hospitals.

The adaption of SCM to the healthcare sector has to start with a basic understanding of how healthcare SCs are structured and relationships are managed. To do so and in order to understand and to explain decision-making and practices in a complex network of collaborating firms like the healthcare SC, we draw on several organizational and behavioral theories and discuss the potential applicability of core concepts of these theories for a hospital SC. The reason for focusing on the SC of a hospital is that hospitalization is one of the most expensive types of health care treatments. Although inpatient hospital services account for a small share of health care utilization, it constitute the largest share of total health care spending (US: 30.7 percent of the total costs of medical service; which is similar to Europe – e.g. 33.4 % in Austria (CMS, 2012; Austrian Ministry of Health, 2013; Pfuntner, et.al., 2013; Moore, et.al., 2014). Besides inpatient hospital services, home health care is of growing importance and research how to operate it efficiently is ongoing (Rest, et.al., 2012).

In this paper we discuss six different theories: the market-based view, resource-based view, network theory, transaction cost analysis, principal-agent theory, and stakeholder. The objective of our paper is to develop and discuss a theoretical foundation of SCM in hospitals based on different organizational and behavioral theories with the aim of explaining how hospitals can structure and manage their SC.

This paper is organized as follows. Section 2 describes the different organizational and behavioral theories used to evaluate how they affect the organization and the management of SCs. Section 3 analyzes the extent to which the theories can be transferred to the hospital and shows how these theories affect the hospital SC. Finally, section 4 presents our conclusions.

ORGANIZATIONAL AND BEHAVIORAL THEORIES

To illustrate how different organizational and behavioral theories affect the organization and the management of SCs and thus also the company's success, the following theories are discussed in this section: market-based view (Porter, 1985), resource-based view (Barney, 1991), network theory (Sydow, 2005), transaction costs analyzes (Coase, 1937; Williamson, 1975), principal-agent theory (Alparslan, 2006) and stakeholder theory (Freeman, et.al., 2010). These theories can be used to justify decisions to develop, strengthen, and protect relationships with suppliers on the upstream side and with customers on the downstream side (Rungtusanatham, et.al., 2003).

Market-Based View (MBV)

The main representative of this theory is Michael E. Porter (Porter, 1985). Porter explains the company's success by the industry structure and the strategic behaviour. According to Porter, there are two basic types of strategic behaviour which enable a firm to gain a competitive advantage: low cost and differentiation. The two basic types of competitive advantage combined with the scope of activities for which a firm seeks to achieve them, lead to three generic strategies for achieving above average performance in an industry: cost leadership, differentiation, and focus (cost and differentiation).

Following the strategy of cost leadership, a company can achieve competitive advantage through by selling its products at a low price. As a result, this company offers its products cheaper than its

competitors and thus gains a competitive advantage. Due to the high amount of products sold means that profitability is given despite lower unit margins. Preconditions for cost leadership are a high market share and high market penetration, efficient distribution systems, low-cost production / mass production and lean processes. A low cost producer must find and exploit all sources of cost advantage. If a firm can achieve and sustain overall cost leadership, then it will be an above average performer in its industry.

With a differentiation strategy a company seeks to be unique in its industry along some dimensions that are widely valued by buyers (e.g. product properties such as design or quality; customer service such as quick repair; brand value). Their product range shows special characteristics compared to competitive products, for which customers are willing to pay a higher price. These companies are able to offer their products at a higher price, as these are characterized by high quality and / or appealing design. Profits will be generated with this competitive strategy through high unit profit margins.

Companies with a low cost or differentiation strategy offer their products across many market segments or industry wide; companies with a focus strategy are only serving a special target segment or niche. They select a segment or a group of segments in the industry and tailor their strategy to serving them to the exclusion of others. The focus strategy has two variants. In cost focus a firm seeks a cost advantage in its target segment, while the differentiation focus means that a firm exploits the special needs of buyers in its target segment. The target segments must either have buyers with unusual needs or the production and delivery system that best serves the target segment must differ from that of other industry segments.

Porter's Five Forces can be used to determine the profitability of an industry and shape a firm's competitive strategy. The forces include 1) threat of substitute products from competitors (including product differentiation, price performance of substitutes and a buyer's ability to switch to a substitute), 2) threat of new entrants (such as barriers to entry – i.e. patents, and other intellectual properties rights, brand control, government regulation, capital requirements), 3) intensity of competitive rivalry (such as the number of competitors, firm growth rates, economies of scale, diversity and depth among competitors, and information complexity), 4) bargaining power of customers (such as concentration of marketing channels, buyer volumes, prohibitive "switching" costs to buyers, and availability of competitive substitutes), 5) bargaining power of suppliers (such as prohibitive "switching" costs, availability of alternative suppliers, degree of labor solidarity, and the sensitivity of selling price to supply costs). The first three forces focus on an analysis of a business' competitors within the sector. The last two focus on the vertical integration of the business with the suppliers and customers. The framework merely determines whether an industry is "attractive" or "unattractive," depending on how they fare in an assessment of each of these forces. It also provides a useful tool for strategic business planners in helping a business to refocus and strengthen areas where a company may have exposure and potential weakness and exploit those areas where they have a competitive strength (Porter, 1985).

Resource-Based View (RBV)

The resource-based view is based on the findings of Jay B. Barney (Barney, 1991). He tried to explain why the performance of companies operating in the same industry differs systematically over time. According to this theory companies achieve lasting success due to the presence and the use of organization-specific and unique resources. The theory assumes that companies are heterogeneous in their resources, that the resources cannot be transferred from company to company without cost, and that their characteristics determine, in part, company outcomes. In addition the RBV argues that the heterogeneous market positions of close competitors derive from each firm's unique bundle of resources ("...all assets, capabilities, organizational a process, firms attributes, information, knowledge, etc..." (Barney, 1991, p.101). Moreover, not all resources hold the potential of competitive advantages. To be a source of sustained competitive advantage, resources must have the following attributes (Barney, 1991): valuable, rare, imperfectly imitable, and non-substitutable. Resources must be valuable, because valuable resource enables a company to improve its market position relative to competitors. Resources must be rare so that by exercising control over them, the company can exploit them to the disadvantage of its competitors. The resources must be imperfectly imitable to prevent competitors from being able to easily develop the

resources in-house. And the resources must not be substitutable; otherwise, competitors would be able to identify different, but strategically equivalent, resources to be used for the same purpose. The RBV is an implicit assumption in many SC decisions. Outsourcing decisions especially are based on the idea of focusing on core competencies and outsourcing complementary competencies to external partners (Halldorsson, et.al., 2007).

Network Theory (NT)

The Network theory argues that the performance of a company depends not only on how efficiently it cooperates with its direct partners, but also on how well these partners cooperate with their partners (Grandori & Soda, 1995; Cravens, et.al., 1996; Sydow & Windeler, 2001; Sydow, 2005).

A network (= supply chain) will look different from each perspective of a company, as every single company has its own motivation, resources and picture about the network and how it operates. But a company that only sees the SC from its own perspective will fail to understand the dynamics and interface between the well-being of others and itself. In a SC, company strategies should consist of attempting to influence others where possible and especially to benefit from their resources, initiatives and creativity. By combining resources between two or more organizations, each single firm can achieve more advantages than acting independently (Håkansson & Ford, 2002). Hence the value of a resource is based on its combination with other resources and therefore cooperating in a SC becomes more important than possessing resources per se. As resources determine the structure of a SC and therefore become a motivating force, it is important to understand the dynamic inter-organizational relationships in SCs. By emphasizing the importance of “personal chemistry” between the members of the SC, the build-up of trust through long-term cooperative relations and the mutual adaptation of routines and systems through exchange processes enable companies to strengthen their SC. Furthermore, direct communication and real-time information convey a sense of uniqueness in the relationships, resulting in customized SCs to meet individual customer requirements. Therefore SC members need to gradually build up mutual trust through the social exchange processes. This is necessary since a SC does not seek an optimal equilibrium, but is in a constant state of movement and change. According to Ritter et al., 2004 there are three types of interaction between firms in a SC:

- exchanging activities for example trading information, goods, services and social processes
- coordinating activities which include different activities between firms such as synchronizing efforts of different actors which goes beyond pure exchange and
- adaption activities like personal, technical, legal, logistics or administrative elements

The network theory is a descriptive approach and has primarily been applied in SCM to map activities, members and resources in a SC (Halldorsson et al., 2007). The main focus has been on developing long-term, trust-based relationships between the SC members (Forsgren & Pahlberg, 1992; Nohria & Eccles, 1992; Grandori & Soda, 1995; Gadde & Håkansson, 2001; Prajogo & Olhager, 2012).

Transaction Cost Analysis (TCA)

The transaction cost theory has its origin in the early work of Ronald Coase (Coase, 1937) on "The Nature of the Firm", which was expanded later on by Oliver Williamson (Williamson, 1975) in his book *Markets and Hierarchies*. Coase, 1937 analyzed why some transactions seem to be organized by markets as economic theory demands, while others seem to be organized by hierarchical arrangements, such as firms. His answer was that there is a cost for using the pricing mechanism – so called transaction costs. If the transactions costs are sufficiently high, someone will organize the transaction via a hierarchy, as opposed to a market. Hybrid forms, so-called networks, can be found to exist between hierarchy and market. Transaction costs can be divided into three main classifications (Hobbs, 1996):

- information costs (e.g. costs of searching for information about products, prices, buyers or sellers),

- negotiation costs (arise from the physical act of the transaction, such as negotiating and writing contracts),
- monitoring costs (arise after an exchange has been negotiated, such as monitoring the quality of goods the behaviour of a supplier or buyer to ensure that all the pre-agreed terms of the transaction are met or costs of legally enforcing a broken contract).

Due to this, the TCA offers an approach to determine the firm's boundaries and can be used to present efficiency as a reason for entering inter-organizational arrangements (Williamson, 1975). Firms can reduce their total transaction costs by cooperating with external partners. This raises an important question as to which activities should be performed within the boundary of each firm, and which activities should be outsourced. There are four key aspects that underpin this theory:

- Bounded rationality - means that although people may intend to make a rational decision, their capacity to accurately evaluate all possible decision alternatives is physically limited (Simon, 1976).
- Opportunism has been defined by Williamson as "self-interest seeking with guile" (Williamson, 1985, p.30). In other words, it recognizes that businesses and individuals will sometimes seek to exploit a situation to their own advantage.
- Asset specificity arises when there is limited value in an alternative application of, for example, physical, human, and dedicated assets (Williamson, 1975).
- Uncertainty can be divided in behavioral and environmental uncertainty (Williamson, 1975).

Asset specificity and uncertainty are the two main aspects which influence the level of transaction costs. The central message of the transaction cost theory is that the coordination of market, hierarchy and hybrid generates different level of transaction costs depending on specificity and uncertainty. Transactions with relatively low specificity and uncertainty have the lowest transaction costs if they are organized by the market. The hybrid form would be the best form of organization for transactions with medium specificity and uncertainty while hierarchy would be the most cost-effective form for transactions with high specificity and uncertainty. A central argument that confirms this statement is that due to high specificity and uncertainty it is very expensive to use the pure market exchange because it is difficult to hedge against opportunism. For this protection, less effort is involved if the transaction is organized by hierarchy (or hybrid) (Williamson, 1985).

Principal-Agent Theory (PAT)

The principal-agent theory deals with the collaborative relationship between two parties, the principal (e.g. employer) and agent (e.g. employee). Based on the separation of ownership and control of economic activities between the agent and the principal, various agency problems may arise, such as asymmetric information, conflicting objectives, differences in risk aversion, outcome uncertainty, behaviour based on self-interest, and bounded rationality. The contract between the principal and the agent governs the relationship between the two parties. The aim of PAT is to design a contract that can mitigate potential agency problems. The "most efficient contract" includes the right mix of behavioral and outcome-based incentives to motivate the agent to act in the interests of the principal (Alparslan, 2006). Misalignment often stems from (Brockhaus, 2013): 1) hidden characteristics (describe a situation where the principal is unaware of important properties of the agent prior to the transaction. The owner of a company is for example often unaware of the skills of the manager he hires), 2) hidden actions (occurs when the behaviour of the agent cannot be monitored properly by the principal. E.g. the financial success of a company in a given period of time can be attributed to both the quality of the management as well as the overall economic situation thus making assessment of the work and commitment of the manager difficult), 3) hidden information (can be observed, if a principal can monitor the agents behaviour, but does not have the ability to assess whether or not this behaviour is appropriate or in his best interest. An example for this is if a company hires an expert in a certain area and does not have the internal capability

of evaluating the quality of his work) and 4) hidden intention (a situation where the principal was unable to foresee the agent's true intention. A typical example is the so called lock-in effect (Ewerhart, 1997) – when specific needs or investments either on the part of the principal or the agent have created a situation of mutual dependency that allows the agent to behave in ways unintended by the principal at the time of contracting). However, misalignment can be mitigated by creating contracts with SC partners that balance rewards and penalties, (Yu, et.al., 2001; Romano, 2003; Jain, et.al., 2006; Halldorsson, et.al., 2007; Choi, 2010).

Stakeholder Theory (STHT)

The stakeholder theory, which became popular during the 1980s, suggests that corporations should look beyond the shareholder theory of profit maximization, and take other stakeholder groups that the corporation is associated with into consideration as well. One of its most famous representatives is R. Edward Freeman (Freeman, 1984) who has merged different precursors into a book for strategic management. The first reference in management literature was 1963 in a paper by the Stanford Research Institute (Freeman, 1984). Here the term stakeholder was defined “as the only group to whom management need be responsive“ (Freeman, et.al., 2010, p.31). The classic definition of a stakeholder is “any group or individual who can affect or is affected by the achievement of the organization's objectives” (Freeman, 1984). The central idea of this theory is that the success of a firm depends on how well it manages its relationships with key stakeholders such as customers, employees, suppliers, communities, financiers, and others that can affect the realization of its purpose. Thus the management needs to ensure the continued support of all of these stakeholders, balancing their interests, while making the organization a place where stakeholder interests can be maximized over time. In general, Freeman, et.al., 2010 divides stakeholders into two groups: primary stakeholder (customers, supplier, financiers, communes, and employees) and secondary stakeholders (politics, government, competitors, media, consumer organizations, other interest groups).

In the following section we discuss how the theories discussed in this section or at least central ideas of the theories can be transferred to and applied in the setting of hospitals.

THEORIES APPLIED TO HOSPITALS

Market-Based View from the Point of View of a Hospital

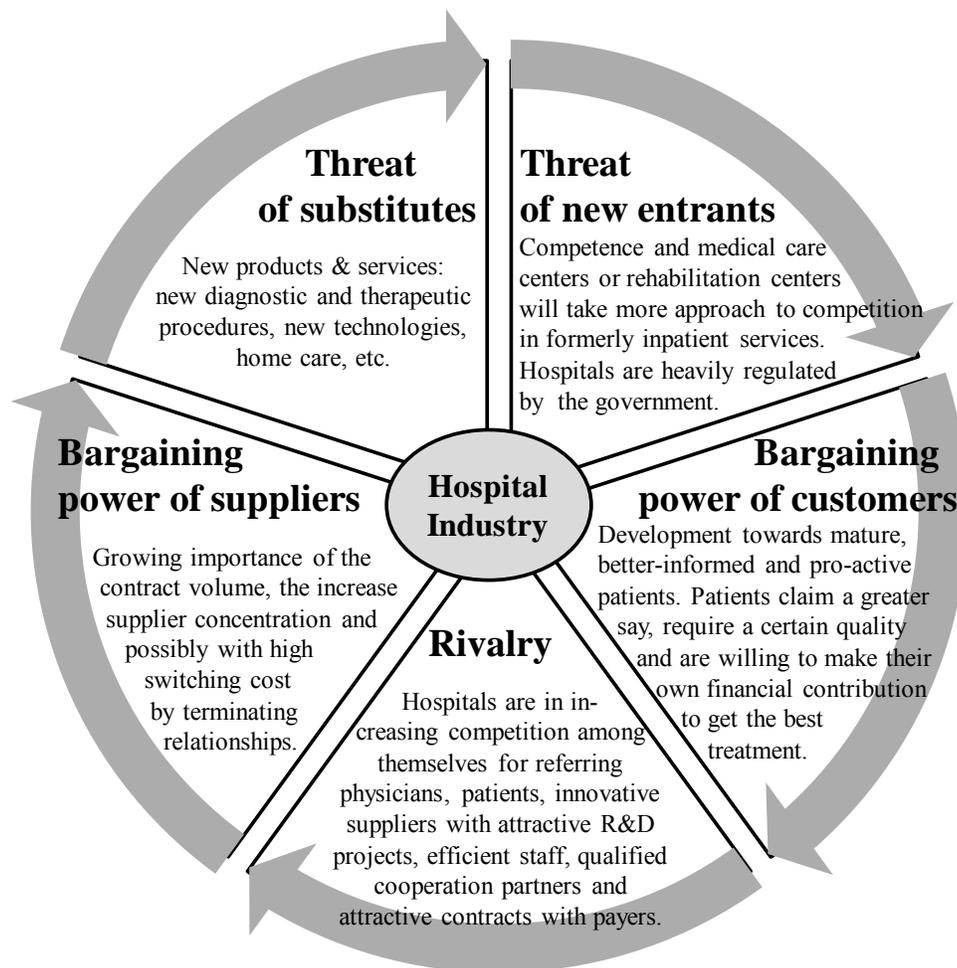
Considering that the healthcare sector, in particular hospitals, is developing from pure welfare institutions to companies which increasingly compete with each other, it makes sense to transfer the market-based view to the hospital. With regard to the emerging market dynamics it can be seen that hospitals increasingly compete with each other on different healthcare submarkets (Breckner, 2007). For this reason, we will look at the competitive factors and the competitiveness of hospitals from a market-based view.

Before looking more closely at the basic strategies of the market-based view, we will have a look at the industry structure of a hospital based on the five competitive forces according to Porter. Hospitals are among themselves in increasing competition for referring physicians, patients, innovative suppliers with attractive research & development projects, efficient staff, qualified cooperation partners and attractive contracts with financiers. The five forces in the view of a hospital might be seen as follows:

- 1) Threat of substitute products from competitors. In hospitals the term substitute products need to be extended to substitute services, which affect the competitiveness of a hospital. Important issues are new diagnostic and therapeutic procedures (for example, the trend towards micro-invasive surgery), the use of new technologies (especially in medical technology) as well as increasing home care.
- 2) Threat of new entrants. Due to the already mentioned market dynamics hospitals in future will not only have to compete with each other but also with competence centers, medical care centers or rehabilitation centers (Behrendt, 2009). Furthermore, it can be seen that more and more private clinics are entering the market (Breckner, 2007).

- 3) Intensity of competitive rivalry. Hospitals are in increasing competition among themselves for referring physicians, patients, innovative suppliers with attractive R&D projects, efficient staff, qualified cooperation partners and attractive contracts with financiers (Breckner, 2007).
- 4) Bargaining power of customers. Customers, especially the patients, are of increasing importance in hospitals, as the role of the patient changes as they become more mature, better-informed and pro-active. Patients claim a greater say, require a certain quality and are willing to make their own financial contribution to get the best treatment.
- 5) Bargaining power of suppliers. The role of suppliers is also becoming more and more important. The decrease of direct suppliers and the increased trend towards system suppliers and logistics service providers means that suppliers can strengthen their market position. Thus hospitals are confronted with the growing importance of the contract volume, the increased supplier concentration and possibly with high switching cost by terminating relationships.

FIGURE 1
PORTERS 5 FORCES APPLIED IN HOSPITALS



In addition to the five competitive forces we will look at the basic strategies between which a hospital should decide.

- A) COST leadership (achieves competitive advantages through reduced service and / or production costs and thus consequently lower prices). This would have been a quite conceivable strategy for a hospital if cost leadership did not simultaneously imply price leadership. It is not possible to realize cost leadership for general hospital services because prices are regulated by law through the DRG system. The same applies to special benefits where legal price limits are also defined. Another argument against cost leadership in hospitals is that the price does not serve as a selling argument to patients, as a patient's price sensitivity is very low as a patient pays just a small amount of money for their treatment (the rest will be paid by their health insurance, which is obligatory in Austria). Due to all of this it can be said, that at this time cost leadership is not a feasible strategy. Even if statutory regulations changed the question is whether cost leadership should be a targeted solution in view of the quality of patient treatment which should be of paramount importance. However, hospitals can follow parts of this strategy regarding cost reduction. Outsourcing decisions (e.g. information and communication technology infrastructure - ICT, entire business processes and/or care processes) could be one example. Outsourcing decisions regarding the IT-services can enable hospitals to change their fixed costs into variable costs, avoid direct subsequent costs (e.g. maintenance) and thereby improve their performance. Further approaches to achieve cost advantages are for example permanent analysis of variable costs to reduce unit costs, continuous analysis of overhead costs, ongoing optimization of capacity and asset utilization, capacity expansion to reduce fix costs and the right decision of facilities (Greiling & Muszynski, 2008). It should be noted that all these examples are just approaches for a cost leadership strategy.
- B) A differentiation strategy enables hospitals to distinguish themselves from the competition through special services or quality. One possibility to realize this strategy in a hospital would be to offer special treatment methods for patients. A special method of treatment, would be the use of mobile display solutions, a method which is not currently in use at the moment This solution would make it possible to reduce costly hospitalizations (especially for patients who are chronically ill). Sensors could monitor certain indicators like heart rhythm, respiration and so forth which would effectively reduce the amount of inpatient care (Behrendt, 2009). Although this strategy seems more likely to be successful than the cost leadership strategy some challenges still remain. According to Porter in a differentiation strategy it is not possible to pay particular attention to costs, which is not feasible due to the enormous cost pressure hospitals have nowadays. Thus, the legal parameters means this strategy restricted. To sum up it can be said that a differentiation strategy is possible, but only under the restriction of the given budget.
- C) As neither the cost leadership strategy nor the differentiation strategy is applicable in hospitals, the focus strategy is inapplicable too implying one of the two. If we exclude cost leadership and differentiation, a modified focus strategy for hospitals would be possible namely in terms of focusing on a certain part of the market (e.g. a special department of neurology) and certain patient groups (e.g. children's hospitals). Legally, these hospitals are subject again to the same restrictions as those that focus on the entire market.

It can be concluded that although the MBV can be applied for hospitals there are certain restrictions which have to be accepted. Not every strategy can be applied to the hospital in full but under certain legal conditions and regimentations and with a few modifications it is possible. It is essential to look at the environment of a hospital when evaluating the extent to which the five competitive forces can be applied, this especially due to the rising market dynamics and the increasing competition in the healthcare sector. But it is also critical to note that this approach is just an externally oriented approach and that, especially in hospitals, the internal strengths and weaknesses as well as existing resources and capabilities play an important role.

The Resource-Based View from a Hospitals Point of View

According to the RBV hospitals need strategically relevant resources to be competitive. The question is which resources lead hospitals to success. It is obvious that drugs have to be stored at the right/optimum temperature or protected from sunlight if it impairs efficacy. (Ekkernkamp, et.al., 2015) And it is also obvious that medical equipment requires regular maintenance. A resource that has received little attention so far is staff. This is remarkable, considering that patient satisfaction is one of the top priorities in hospital and personal care services plays an important role in healing patients. The performance and knowledge of staff is therefore essential. We hear and read ever more frequently about the dissatisfaction of nurses and physicians. They criticize the working conditions and that they have too little time for the treatment and care of patients (Ekkernkamp, et.al., 2015). Assuming that demographic changes will lead to a higher demand for hospital services and at the same time the number of persons employed will decrease, it is time that hospitals position themselves as attractive employers. Another reason why staff constitutes a particularly important resource in hospitals is their contact with patients. In comparison to other companies, which mostly have a more intensive customer contact, the duration of interaction in hospitals is low (4.9 days in US and 6.7 days in Austria) (OECD Health Data, 2011). Employees therefore have to meet the individual needs of a patient within a very short time. In addition, patients are not able to assess the medical outcome. But they use substitute indicators to do so. The most important substitute indicator is employee behaviour. Thus patients' satisfaction depends primarily on the hospital's staff. Although staff play an important role additional resources are necessary in order to treat patients well. These include the infrastructure (beds, operating room...), different medical equipment (CT, MRI) or IT-systems, which support the planning and information flow. If a hospital has special medical equipment which is valuable, rare, imperfectly imitable, and non-substitutable it can achieve competitive advantage. However, as (acquisition-) costs are mostly very high it is necessary to pay attention to their utilization. Last but not least patients are an essential resource for hospitals. Without them a hospital would be obsolete.

In summary it can be stated that according to the resource-based view hospitals are successful because they are in possession of valuable, rare, imperfectly imitable, and non-substitutable resources and that one of the most important resources in hospitals might be staff.

The Network Theory in Hospitals

The term network is getting more and more important in the context of hospital management. On the one hand, process thinking and growing interface management is essential and hospitals try to increase cooperation and integration with other SC-partners (Kriegel, 2012). On the other hand, mastering growing complexity, which arises due to the resource-based view as well as from the market-based view at the interface with the environment, is a challenge hospitals have to face.

In terms of the complexity of resources the variety of professionals, services and products (e.g. drugs), the individuality of each patient and the use of modern medical devices can be named. According to the supplier and customer side a significant number of different suppliers (e.g. pharmaceutical companies, general practitioners, medical technology companies, laundry, dishes, furniture) and customers (e.g. nursing homes, rehabilitation clinics, specialist physicians) need to be considered.

Hospitals have a variety of options and solutions to reduce, dominate and avoid complexity in a network and to take advantage of networks for long-term success and competitive advantage. Examples are building up strategic relationships with suppliers and customers, tailored target systems and decision-making structures, sharing of modern information and communication technologies as well as standardized and bundled business and performance processes. Which tasks and activities a hospital should carry out together with its network partners, which within the organization and which should be outsourced or purchased by the market, mainly depends on the level of transaction costs.

Transaction Cost Analysis in Hospitals

The key message of the transaction cost analysis is that the three identified forms of coordination which are market, hierarchy and hybrid are depending on specificity and uncertainty and have therefore

different levels of transaction costs (Williamson, 1985). Outsourcing decisions play an important role in this theory as they are dependent on the level of transaction costs. In the past, hospitals' outsourcing decisions were mostly focused on non-medical services such as meal, laundry, cleaning and building services. Nowadays, medical services, such as laboratories or sterilizations are increasingly outsourced (Blum, et.al., 2007). Special forms of outsourcing in Austrian hospitals are "public private partnerships (ppp)". The term "public private partnership" refers to forms of cooperation between public authorities and private companies due to financing, construction, renovation, operation and / or maintenance of an infrastructure or the provision of services. PPPs are stable long-term cooperations between the public and private sector with an appropriate distribution of risks and responsibilities.

Irrespective of whether transactions are organized by hierarchy, hybrid or market, the supply chain members relate to each other. How these kinds of relationships are characterized and which challenges need to be tackled is described by the principal-agent theory.

The Principal-Agent Theory in Hospitals

As an essential part of the healthcare sector hospitals are characterized by a large number of principal-agent relationships with other stakeholders (patients, physicians, nursing homes, health policy, health insurance, etc.). Regarding the SCM aim to improve the competitiveness of a hospital through an optimum customer focus, we will especially discuss the relationships between physicians and patients in more detail. The relationship between the hospital (in form of the physician, representing the actual care provider) and the patient is characterized by mutual information asymmetry. Compared with the patient who is in the role of a principal, the physician as an agent has a significant advantage due to the medical knowledge that is required to treat the patient. At the same time, this knowledge advantage is the main reason for the interaction between physician and patient. As in every principal-agent relationship the physician is also confronted with information asymmetries due to the characteristics and behaviour of the patient. It may happen that the patient withholds relevant information about medical history or fails to comply with formalities (e.g. the patient knowingly impacts the success of treatment by breaking off a prescribed diet) (Schwartz, 1997).

However, information asymmetries occur not only during the contractual relationship, i.e. during hospitalization. Even before contracts are concluded, there might be some information which is unknown to both parties (hidden characteristics). As an example the lack of experience of the treating physician can be named. Since the assessment of the performance of the physician only takes place *ex post*, it may lead to adverse selection on the part of the patient, for example to select an unwanted contractual partner. However, it is important to note that the decision about the choice of a hospital or physician is in most cases not made by the patient himself, but by the referring physician. While the referring physician usually knows the reputation of a hospital or the specialization of the physician, the features and capabilities of the physician are mostly unknown. Thus, the referring physician assumes the role of the patients' agent, whose job it is to make the best decision in terms of the patients' medical care (Schwartz, 1997). The problem of hidden action and hidden intention in the physician-patient relationship is that the patient is neither able to fully monitor, nor to judge the performance of the physician. He therefore does not know whether recovery is due to the treatment of the physician, or perhaps to changing life circumstances. Furthermore, the patient is not able to determine whether another doctor would have yielded a better outcome or not.

Finally, the principal-agent theory in hospital is important as the medical outcome heavily depends on the relationships between the different actors, especially between physician and patient.

At the beginning of this chapter it was mentioned that the hospital is related to a variety of actors. Which actors are the most relevant for hospitals and which are affected by the performance of a hospital, will be explained as part of the stakeholder theory.

Stakeholder Theory in Hospitals

As already mentioned a hospital has many stakeholders. Secondary stakeholders in hospital are state, politics, society and the media as independent representatives of society. Although these players have no

direct influence on a hospital's activities and processes, they can have an influence on legislation and thus on the hospital's organization. Furthermore, hospitals are associated with other secondary stakeholders, which also have an impact on the value of the hospital. Suppliers, patients, employees as well as financiers can be named here. Due to the increasing competition, the growing pressure on rising costs and a lack of (personnel) resources hospitals are forced to consider their stakeholders. Additional secondary stakeholders in the view of a hospital are all actors in the healthcare system as well as its competitors (Kriegel, 2012). Primary stakeholders in hospital are suppliers, the service provider, patients, employees, referring physicians, owners (Kriegel, 2012). Particularly important stakeholders to the hospitals are employees and patients. Without them a hospital would be obsolete. Other important stakeholders are the suppliers and the referring physicians. Establishing stable relationships with suppliers is difficult because on the one hand many special products and devices have to be procured and on the other hand many people are involved in the decision making process. In addition, special products and devices are only available from a very small number of suppliers or even from one single supplier; or if a device is purchased at a certain company the medical consumables (e.g. reagents in laboratory machines) have to be obtained from the same company. Referring physicians are important as they are responsible for the continuing flow of patients to the hospital. On the other hand, a majority of hospital services as well as hospital costs are caused by these groups. For the purpose of cost reduction as well as the optimal use of resources it would be advisable that hospitals provide just those services, which cannot be done by resident physicians.

TABLE I
ORGANIZATIONAL AND BEHAVIORAL THEORIES APPLIED IN HOSPITALS

Theory	Author(s)	Central Statement	Central Statement in Hospitals
MBV	Porter, 1985	The company's success depends on the industry structure and the strategic behavior. The industry structure can be analyzed by Porters five forces (substitute products, new entrants, intensity of competitive rivalry, power of customers, power of suppliers) And there are three generic strategies for achieving competitive advantage in an industry: cost leadership, differentiation, and focus.	The MBV is just under certain restrictions transferable to the hospital. Not all strategies are applicable for hospitals (or just under certain legal frameworks/regulations).
RBV	Barney, 1991	Companies have lasting success due to the presence and the use of organization-specific and unique resources. The theory assumes that companies are heterogeneous in their resources, that the resources cannot be transferred between companies without cost, and that their characteristics determine company outcomes.	Hospitals need strategically relevant resources to be competitive. The most important resource is staff, although staff has received little attention so far. With regard to the lack of human resources, this will or rather need to change in future. Other important resources are the infrastructural facilities (e.g. beds, operating room), major medical equipment (e.g. CT, MRI), as well as ICT systems and the patients, without them hospital services would be superfluous.

NT	Sydow, 2005 Sydow & Windeler, 2001	The performance of a company not only depends on how efficiently it cooperates with its direct partners, but also on how well these partners cooperate with their partners. The value of a resource is based on its combination with other resources and therefore cooperating in a network becomes more important than possessing resources per se.	Hospitals gain a competitive advantage by seeking to cooperate with their supply chain partners. By managing their networks hospitals are able to reduce and manage the growing complexity.
TCA	Coase, 1937; Williamson, 1975	Depending on specificity and uncertainty there are different levels of transaction costs and therefore transactions can be organized by markets as economic theory demands or by hierarchical agreement.	Which tasks and activities a hospital should coordinate in a network, in its organization and which should be outsourced or purchased by the market depends on the level of transaction costs. Therefore it is necessary that hospitals have an understanding of specificity and uncertainty.
PAT	Alparslan, 2006 Håkansson & Ford, 2002	The aim of the theory is to design a contract that can mitigate potential agency problems whereby the “most efficient contract” includes the right mix of behavioral and outcome-based incentives to motivate the agent to act in the interests of the principal.	The physician-patient-relationship is characterized by bilateral information asymmetries and behavioral uncertainties. Thus, physician and patient both resume the role of the principal, as well as the role of the agent and therefore both are confronted with agent problems.
STHT	Freeman, et.al., 2010	An organization's success depends on how well it manages the relationships with its key groups.	Due to the high amount and the high influence of individual stakeholders, their management is as important as the management of the hospital itself. Among the most important stakeholders (next to government and politics) are suppliers, service provider, patients, employees and referring physicians.

CONCLUSION, LIMITATIONS AND FURTHER RESEARCH

The purpose of this paper was to discuss whether different organizational and behavioral theories might bring insights into the design and the management of the hospital supply chain and thus its success. It can be noted that each of these theories has a significant contribution to make. According to the MBV, it can be said that this theory is indeed transferable to the hospital; however, certain restrictions must be taken into account. For example, not all strategies are applicable for hospitals or only under certain legal frameworks/regulations. Considering the five competitive forces in the hospital environment is relevant and important due to the increasing market dynamics and the increasing competition. On a critical note, it must be pointed out that this approach is a purely outward-oriented and in hospitals internal strengths and weaknesses as well as existing resources and capabilities play an important role too. Which resources lead to competitive advantage for hospitals has been explained according to the RBV. Here it can be said that the most important resource is staff, although staff has received little attention so far. With regard to the limited human resources, this will or rather need to change in future. Other important resources are the

infrastructural facilities (beds, operating room), major medical equipment (CT, MRI), as well as ICT systems and the patients, without them hospital services would be superfluous.

The network theory described the benefits for hospitals if they cooperate with supply chain partners. Here, especially, the reduction and management of the growing complexity, which results both in terms of the resource-based view and the market-based view, was discussed.

Transaction cost theory provides a contribution to answer the questions 1) which tasks and activities a hospital should coordinate in a network 2) which should be carried out within its organization and which should be outsourced or purchased by the market. The choice of the best organizational form depends on the level of transaction costs.

As part of the principal-agent theory relationships between SC-partners were described with regard to occurring information asymmetries and behavioral uncertainties. Thereby a special focus was on the physician-patient-relationship which is characterized by bilateral information asymmetries and behavioral uncertainties. Thus, both (physician and patient) resume the role of the principal, as well as the role of the agent and are therefore both confronted with agency problems.

Finally the key stakeholders of a hospital were discussed. Due to the very high influence of individual stakeholders a hospital is confronted with, their management is as important as the management of the hospital itself.

Further research may explore if and how these theories are applied in practice, and if and how managers in hospitals make decisions following these theories. Moreover it is necessary 1) to develop a basic understanding of supply chain management in a hospital (how does the structure of a hospital look, which SC process can be identified and which have to be managed, monitored or not managed by the hospital and its network partners), and 2) to identify and analyze the deficits within and between supply chain processes in hospitals. This understanding of SCM in hospitals is the first step towards the realization of a patient-centric and efficient healthcare system.

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