Role of information systems in supply chain management and its application on five-star hotels in Istanbul

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Abstract

Purpose – Supply chain management (SCM) has become important in the service sector nowadays, because customer satisfaction is dependent on the efficiency of supply chain activities. Hotels are operations where personal guest satisfaction is a major priority. A large and diverse range of supply factors are gathered according to the requirements of guests, and then service is provided. The purpose of this paper is to examine the relationship of SCM and information system (IS) in five-star hotels.

Design/methodology/approach – Data were collected from senior management and relevant department authorities of five-star hotels in Istanbul by asking them open-ended questions. The findings were evaluated with descriptive analysis and different conditions of usage information systems in SCM were presented and then issues were determined.

Findings – The findings were evaluated in five groups; four of them being: First, purchasing, inventory management, warehousing, customer relationship and service production processes in these enterprises are mainly being carried out by conventional methods. Second, internet is being used instead of fax as a means of communication in the supply chain. Third, respondents say that the use of information systems is reflected in the speed, reliability, easy access, low cost applications and time saving within the supply chain process. Fourth, Netsis program is the most frequently used and the advantage of its ERP applications are also being used.

Research limitations/implications – The findings were evaluated by descriptive analysis method. Because of the low number of participants, statistical analysis does not give meaningful results. Consistency of responses given by participants is tested by the investigation of cross relations between the questions.

Originality/value – In this paper, the supply chain structure in hotels, and supply chain information systems are being examined through the interactions of the members. To achieve this goal, the relationship between information systems and the supply chain structure has been established and the role of information systems in SCM is determined with the help of corporate information systems.

Keywords Turkey, Hotels, Supply chain management, Information systems, Financial information systems, Hotel accounting

Paper type Research paper

1. Introduction

Today, businesses are trying to develop cooperation with the value chain members (supplier, manufacturer, distributor, etc.) to achieve their objectives. These efforts, also known as supply chain management (SCM), direct business processes among enterprises to ensure regular coordination and control, reducing costs and

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accelerating the process to increase profit. In the new concept of business, results such as profitability, productivity and efficiency are dependent on good management of the internal processes of the business. Close cooperation with vendors, suppliers, manufacturers, customers, which are also part of the supply chain is necessary.

Application of information system (IS) in business administration provides savings on input costs such as time, labor, and energy, and thus enables realization of profitability and customer satisfaction collectively. Hotels can create safer and more cost-efficient supply chains thanks to efficient usage of ISs in the supply of both fixtures and daily consumables. Especially, it becomes more important to make use of modern information technology in SCM in regard to controlling costs of short-life foods.

2. Conceptual background
2.1 Supply chain and management
Definition of SCM by the global supply chain forum:

> Supply Chain Management is the integration of key business process from end-user through original suppliers that provides product, services, and information that add value for customers and other stakeholders (Croxton *et al.*, 2001).

SCM in hotels means information, material and money flow coordination and integration of the network of suppliers, customers, distributors and manufacturers (Lee, 2000). SCM refers more to doing business electronically. SCM mainly consists of five areas. These are: strategic planning, marketing and sales, logistics, information technology and finance (Genç, 2009). Here, the processing load of supply focuses on the logistics process. Logistics can be understood as the positioning of the resources in the supply chain within a time frame.

The supply chain cannot be properly addressed by examining separately such factors as purchasing, inventory management, functions like logistics line or distribution channel. This kind of perception slows down the development of SCM (Lummus and Vokurka, 1999). The supply chain should not be considered as a single process, it should be regarded as a matrix of components that can be controlled by management. The purpose of each entity in the supply chain is to forward the new information to the chain members and thus provide the perfect balance of supply and demand (Karasu, 2006). Certainly, every business aims first to increase its profits. But the philosophy of supply chain objectives is to increase the value of all the chain members so that ultimately the customer will have benefit (Frazelle, 2002).

2.2 ISs and supply chain relationship
A good decision is based on timely, accurate, relevant and full information. This simple formula, unfortunately, is not very easy to apply. To obtain the desired quality and quantity of information is one of the most complex problems facing the decision-maker. Beyond a good software and system set up, SCM needs personnel with the ability to communicate and establish good relations with suppliers. To be successful in different areas of knowledge it is necessary to utilize SCM (Öztüren, 2008).

Information is the connection between all of the activities and operations in a supply chain (Hugos, 2006). Without information integration, few gains can be made in overall supply chain integration (Lee, 2000). Information technology developments that enable

sharing of information on demand throughout the entire chain inventory can reduce costs by between 2.2 and 12.1 percent (Cachon and Fisher, 2000).

In the hospitality sector, the elements of management ISs can be grouped as form, human, information technology and application procedures. When we think of ISs, information technology usually comes to mind. However, in the use of ISs is for people who are the decision-makers. The human element is far more important for businesses such as hospitality, which gives priority to the quality of service. The human element is the most important factor to ensure the continuity and success of an IS. Besides accommodation management expertise, the human element must be able to work as a group and be willing to share information.

Policies regulating the operation of supply chain processes, standards, resolutions, contracts, performance measures, organizational chart, job descriptions, business contacts and information flow charts and similar documents with an explanation of the data collection and reporting tools and forms of information, are the tools to be considered within the scope of the procedures. Thanks to such procedures the formation of a standard and reliable business model has been provided with different kinds of people. Thus, efficient and effective work environment and controlled processes are simulated.

2.3 Supply chain information technology

The basis of the SCM approach lies in information and communication technologies. Information and communication technology is a good solution to problems arising from the complexity of buyer-supplier and supplier-supplier systems and SCM (Gunasekaran and Ngai, 2004). Information technology is a globally competitive tool for data collection, data processing through a process of conversion of knowledge, information storage and transmission to users, when required. Information technology includes computer-based IS hardware, software, communications and all the interface elements. For healthy management of this process, information technology should be compatible among members of the supply chain; procedures should be determined with each other.

In the supply chain processes, information technologies such as radio frequency identification (RFID), electronic data interchange (EDI), barcode are being used. RFID is the common name for technologies used to identify objects with radio waves. A large part of supply chain applications can be traced with RFID technology. The use of barcode and data matrix systems provides convenience in warehouse management systems. The results of a survey show that in supply chain and logistics processes, the use of RFID technology is still low despite the widespread use of EDI and enterprise resource planning (ERP) systems (Olorunniwo and Li, 2010).

EDI is transfer of business data from a standard computer to the other partner's computer application. Most importantly, EDI imposes a one-to-many architecture for communications between supply chain members (Kahl and Berquist, 2000). For EDI it is necessary to have EDI standards, the conversion software and the ability to communicate (Genç, 2009). EDI permits the electronic exchange of inventory information, purchase orders, invoices, and funds transfers to settle accounts (Tesone, 2006). Most importantly, EDI imposes a one-to-many architecture for communications between supply chain members (Kahl and Berquist, 2000).

The development of management ISs has created the opportunity for global networking via internet, intranets, and extranets. There are numerous opportunities

to expand open systems aspect of hotels. The only limitation for current and future hospitality managers is their imaginations (Tesone, 2006). Hospitality organizations that use IT capabilities enhance their competitive edge. Customized solutions, business collaboration, and flexible organization structures all provide what the customer is looking for when doing business with a firm (Tesone, 2006). One thing to always remember is that in order for an information technology system to generate a positive return on investment (ROI), it must either reduce costs or increase revenue in some quantifiable way. While a hospitality professional may not remembers everything about detailed ROI calculations or IS minutiae, he or she can always fall back on this most basic premise (Nyheim *et al.*, 2005). Even though the characteristics of ISs and information technology used by businesses are different, nowadays, the internet makes it largely possible to share information among companies. Naturally, supply chain applications become web-based applications.

2.4 Enterprise information architecture
Functional areas known as a intensive knowledge production and knowledge-based decision-making are the middle management level of these sections. This relationship is shown in Figure 1. As shown in the figure, at the upper management level information within the business are used at the least amount and at the broadest terms of use, and top management focuses on the interaction between business and the outside world. Functional ISs based on the basic business functions can be examined in the form of service production, marketing, human resources, finance and accounting. These are ERP, SCM, customer relationship management (CRM) and knowledge management systems (KMS). Each of these is configured with the logic of ISs operated by associating with each other.

Enterprise system, also known as ERP system is a software system, which is an integration of activities such as finance, accounting, human resources, customer demand, supply, production, marketing, sales, distribution and allows the flow of information. ERP systems support in general recurring and continuity of the business processes such as SCM, order management and payment transactions.

ERP systems give companies the flexibility to respond rapidly to a customer request while producing and stocking inventory only with what is needed to fulfill existing orders. Their ability to increase accurate and on-time shipments, minimize costs, and increase customer satisfaction adds to the firm's profitability (Laudon and Laudon, 2009).

SCM systems, as described previously, help businesses manage relationships with their suppliers. CRM systems, help firms manage their relationships with customers. CRM systems provide information to coordinate all of the business processes that deal with customers in sales, marketing, and service to optimize revenue, customer satisfaction, and customer retention (Laudon and Laudon, 2009). KMS enable organizations to better manage processes for capturing and applying knowledge and expertise. These systems collect all relevant knowledge and experience in the firm, and make it available wherever and whenever it is needed to improve business processes and management decisions (Laudon and Laudon, 2009).

The members of the supply chain (supplier, manufacturer, distributor, customer) and those operating in the sub-units (department, section, individuals) must be in contact with each other. This information allows members of the supply chain network to act as a single enterprise. This increases the importance of building a full-time IS.
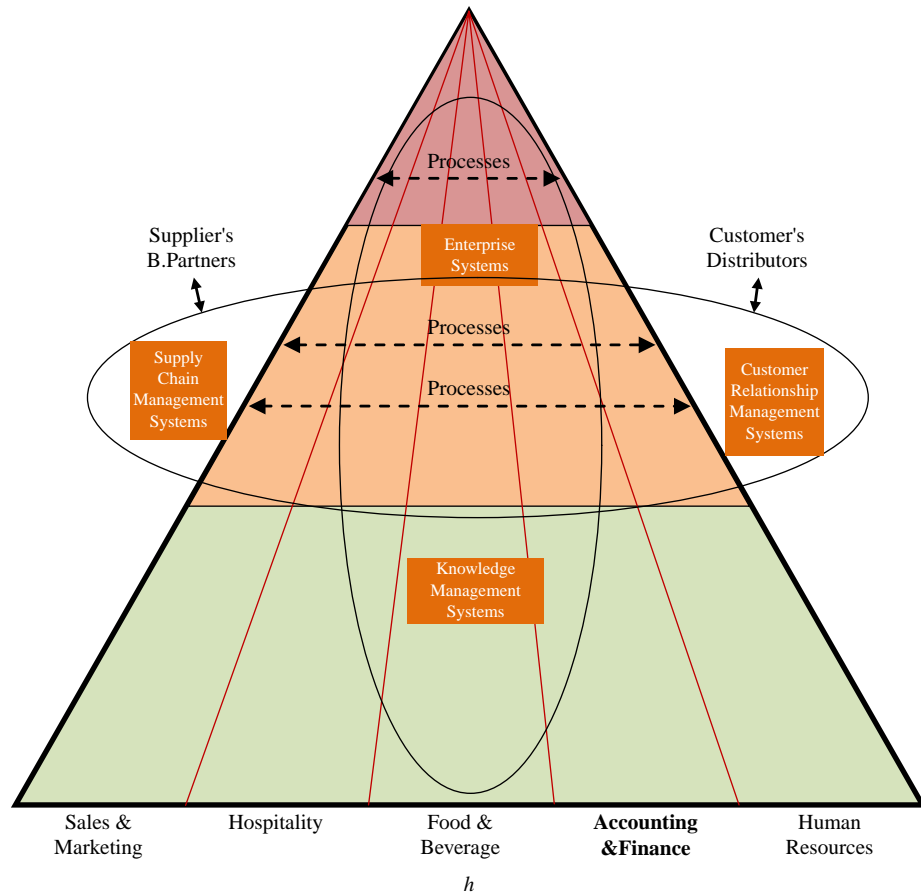
Figure 1.
Enterprise application
architecture

Information on the supply network is common knowledge to all members of the supply chain, and can be accessed at any time. Information sharing on the basis of SCM, supply chain and the chain of communication between departments within an enterprise with members of their own communications network is extremely important in terms of supply chain efficiency.

2.5 The role of financial information in SCM of hotels
Accounting IS is a subsystem concerned with business assets and resources caused by activities and detecting changes that can be measured with money, monitoring, valuing and transmitting results. On many issues such as production and operating costs, pricing, profit planning, customer value, pricing, purchasing, leasing, financial performance and valuation, recovery of investment, support for decision-making is provided with information supplied from the accounting IS. An important part of this information is a base of supply chain planning.

Information from front-end transaction processing is sent to the back office for distribution to the shareholders. At the same time, resources are procured by back-end

functions for distribution to the frontline staff members. The majority of back-office functions fall under the jurisdiction of the accounting and finance department. Today all accounting functions are automated through accounting ISs, which consist of computer networks used to report business transactions and economic events that occur within a hotel (Tesone, 2006). For example, supply chain transactions occur as part of the procurement processes that are used to acquire material resources for use in the hotels.

The performance evaluation of SCM holds together the members of a supply chain, by identifying problems, directing strategic solutions and allowing monitoring of the implementations of the strategies (decisions). Supply chain structure competencies are evaluated with indicators by processes, technology and business structure. Evaluation based on the direct cost and profit performance goals (cost reduction, increasing sales, increasing profits, reducing investment in inventory, accelerate ROI, and so on) is used to determine the status of realization of the information produced by the accounting IS.

3. Methodology
3.1 Goal and scope
In this study, the supply chain structure in hotels, and supply chain ISs are being examined through the interactions of the members. To achieve this goal, the relationship between ISs and the supply chain structure has been established and the role of ISs in SCM is determined with the help of corporate ISs. In this process, especially the impact of the financial IS is emphasized. Comments, suggestions and findings of the application are based on the information, which is provided by the answers of hotel directors.

3.2 Research method
According to tourism ministry statistics (2010) there are 39 licensed five-star hotels operating in Istanbul. The questionnaire was pre-tested by an initial sample. On the pre-test, several items in the questionnaire were redrafted to improve the presentation. The questionnaires were distributed on the internet and by personal visits in January 2011. The survey was sent to all of them but only 21 responded. In total the survey includes 55 questions. Likert-type 25 questions in the first section were answered by the participants. In the second section some of the 20 questions were left unanswered. In the last section some of the ten questions were also left unanswered.

The findings were evaluated by descriptive analysis method. Because the number of participants is relatively low, statistical analysis does not give meaningful results. Consistency of responses given by participants is tested by the investigation of cross relations between the questions.

4. Finding and interpretation
The findings were evaluated in five groups.

1. What is the supply chain structure in hotels?
The first applications and structural decisions related to the supply chain of the business involved in this study are often from recent origin. It has been understood that new decisions on this issue were taken in the last few years. It has been observed that the supply chain process is constrained by the purchase process. Purchasing, inventory management, warehousing, customer relationship and service production

processes in hotels are mainly being carried out by conventional methods. In these types of decisions, the effect of top management is emphasized.

2. How ISs (information communication technology, expert support, electronic business processes) are being used in dealing with suppliers?
It has been mentioned that information communication technology tools are used extensively in dealing with suppliers. For example, "internet is being used instead of fax" as a means of communication in the supply chain.

But here, ISs are dependent on the use of information technology. The responses show that efficient use of ISs facilitates access to information.

3. What is the effect on the supply chain processes of utilising ISs?
Respondents say that the use of ISs is reflected in the speed, reliability, easy access, low cost applications and time saving within the supply chain process. It is also felt that it contributes directly to customer satisfaction. Unfortunately, it has been observed that businesses without effective and extensive SCM applications, answer according to their feelings rather than the real situation.

4. What is the effect of financial information (accounting) systems in SCM of hospitality enterprises?
In responses, the importance of accounting in SCM has been particularly noted. The importance of accounting has been emphasized in "the processes, which include expenditure and payment". Although different programs are being used, Netsis program is the most frequently used and the advantage of its ERP applications are also being used. Fidelio's material control (MC) module, which is common in the hospitality industry, is being used extensively in applications of the supply chain.

Some responses state that reports are being obtained about accounting systems, purchasing transactions, material consumption, inventory cost, cost of sales, daily summaries of buying and selling, regional sales, cash flows and payments. This type of information is used in various decisions such as purchasing, supplier performance, pricing, logistics and manufacturing processes. Besides the lowering effect on costs of this kind of application, the positive effects on sales and profitability are also stated.

5. Comment on the relationship between the features of hospitality businesses such as operating time (in organization), bedding/room capacity, capital and shareholding structure, the number of suppliers within the "supply chain structure"?
It has been inferred from responses to questions in the last section of the survey, that the structure of the supply chain is closely related to the "management approach" of the enterprise and the attitude of top management. In application, some suggest that operating personnel are experiencing difficulties in adapting to rapidly developing and changing information technologies. Some express a lack confidence in e-commerce applications, and this can be an obstacle to development. However, in the near future expectations of e-business SCM practices will become widespread.

5. Conclusion
Communication and information sharing among members of the supply chain provides for more effective decisions. To achieve this, businesses should invest in infrastructure and use information technology tools effectively and efficiently on ongoing daily operations.

Within an ERP system, each department in the supply chain is inter-dependent, and cannot function if information has not been provided by previous links in the chain. The most important parts in this information process is efficient use of intranet and internet.

IS should based on harmony of investment cost-benefit, continuously kept up to date and be developed with understanding of learning. The role of accounting IS is increased when the dimensions of financial information such as information shared within the supply chain profit, cost, rate of ROI also grows. Thus, hotels and other business areas of SCM practices can be performed more efficiently and more profitably. Management trends and preferences are moving in this direction. However, investment and the ability to apply is currently under development. Hospitality management should develop long-term cooperation and share more information with supply chain members. SCM supported by modern information technology makes it easy to evaluate enhancing practices. The most important result of successful supply chain applications is the decrease in total costs. However, the most important resistance encountered in supply chain applications is that the companies do not want to show their internal structures to other businesses. Modern technology-based ISs in both directions provide a positive contribution to businesses and SCM practices.

There are many benefits gained by using modern ISs. The most important ones provided by SCM are improved time management, cost control, profitability, customer satisfaction and increased speed of response to innovations.

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