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Comparison between Upstream and Downstream Supply Chain Management and How they are affected by E-business

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ABSTRACT

With the increasing interactions and interrelationships among companies, their suppliers and customers, the need for management of the flow of products, material and information is increasing, which created the concept of the Supply Chain Management. SCM is an old concept implemented to create integration between these entities for many years ago, but with the emergent of e-business and the widespread of internet technologies, the activities and processes of supply chain management have been enhanced.

This paper gives short description of the concept of SCM, with its two models, Upstream and Downstream. Two case studies are discussed within these concepts. And finally, it discusses the impact of e-business evolution on the processes of both models of SCM.

Key words: Supply Chain Management, E-business, Upstream Supply Chain, Downstream Supply Chain, E-Procurement.

INTRODUCTION

The world is full with types of relationships. Individuals can't live separately in this world without interacting with others in the boundaries of family, friends, colleges, neighbors or even citizens in one country. This principle of interrelationship has been widened to include businesses as well. There is nothing called a stand-alone business. There are always inputs and outputs to any business. Either production, industrial, service providing or any type of companies need to sell their products or services to customers, and need to purchase supplies for certain processes or even just stationary supplies. This chain of suppliers, companies and customers and whatever intermediary distributors, wholesalers and retailers included, is called the supply chain *(Chaffey, 2011; Mentzer et al., 2001; Muffatto and Payaro, 2004).*

Due to the complexity of processes and relationships between those entities, supply chain management concept has been created to coordinate and integrate among them; the key players of the supply chain. In addition, to managing the main activities of supply chain, such as; purchasing, outsourcing, manufacturing, inventory control, distribution and customer services.

According to (Chaffey 2011) and (*Rayport and Sviokla 1996)*, the concentration is usually laid on the activities within the supply chain that actually add value to the process, which is known as the value chain.

With the emergent of internet and e-business, the supply chain activities have been dealt with other perspectives. With the technology involved, many non-useful and expensive activities have been eliminated and only activities with value added have been remained *(McIvor, 2000)*.

Due to the different types of companies included in a supply chain, with different positions, two models, upstream and downstream supply chains have been found. For companies that deal mainly with suppliers on its buy-side, are considered within an upstream supply chain, while other companies that concentrates on customers and providing services deals in the perspective of the sell-side of the supply chain, downstream *(Chaffey, 2011)*.

In the following sections, two case studies are discussed, each describing either an upstream or downstream supply chain. Then in section 4, the general impact of e-business on the supply chain is discussed. Finally a conclusion and recommendation is given in section 5.

Upstream supply chain management: Kell & rigby case

As discussed earlier, the upstream supply chain concentrates on processes performed on the buy-side of the firm which are mainly its suppliers passing by any existing intermediaries. According to *Chaffey (2011)* the main activities related to this supply chain model are procurement and inbound logistics. The case study discussed in this section focuses on the procurement activity.

(Muffatto and Payaro 2004) have defined procurement in its old fashion, as any activities that relate to operations between the firm and the suppliers, including selecting these suppliers, ordering products or services, delivery of them, invoicing and payment. In addition to any paperwork needed for agreements and the forms used for purchase orders and invoices.

With the emergence of internet, the concept of e-procurement has been created to describe the use of internet technologies to integrate among firms and suppliers in procurement activities *(Chaffey, 2011; Presutti Jr., 2003)*.

Kell & Rigby Pty Ltd., is an Australian construction company that construct and manage medium and large projects for several sectors such as; commercial, industrial and government. Their offices are distributed in Sydney, Canberra and Shanghai, with a staff of 135 full time employees. The case study is published in the site of the National Office for the Information Economy (NOIE) as an example of applying e-business solutions in Australian firms *(NOIE, 2012)*.

In order to achieve transparency and flexibility in dealing with customers and suppliers, Kell & Rigby had adopted system integration and new web-enabled systems including e-procurement, research and banking. E-procurement system will have the full concentration in the case discussion.

RESUSLTS

The main objectives targeted by Kell & Rigby when adopting the e-procurement software, were to manage their purchasing processes, enabling their suppliers of inventory controlling and creating a repository of suppliers information, including contacts, products and lead times information.

The e-procurement software enables the following processes:

1. Including description of company's requirements of products to purchase.
2. Allowing suppliers to view the requirements and accordingly submit details about them, their products and lead times. These information are used for assessing and selecting of suppliers.
3. Adding selected suppliers details to repository.
4. Allowing company to negotiate prices with competent suppliers.

5. Sending purchasing orders online with a corresponding transaction to the account receivables.
6. Processing the order by targeted supplier, and arranging for delivery.

The previously listed processes were discussed in several researches as e-procurement processes *(Chaffey, 2011; Presutti Jr., 2003; Atkinson, 2007),* but they have also added others. Such as; invoicing and payment electronically. These processes weren't mentioned among the processes of the e-procurement software adopted by Kell & Rigby. This is considered, in the author's viewpoint, a shortcoming in the software if such processes weren't implemented within it. Since electronic invoicing and payment will save cost of paperwork, meetings between buyers and suppliers, and maybe banking transactions. It has been added, though, in the company's revenues and costs sheet, were savings in banking and bill payments are displayed, which gives indication of having such processes.

Inventory control was one of the objectives mentioned in the case study, but no details or processes were described about achieving this objective. According to *(Atkinson 2007)* many companies use e-procurement software for ordering products or services online. *(Atkinson 2007)* advices companies to full utilize such software in order to add value to the supply chain. When sharing transparent information about inventory with suppliers, they can easily forecast the demand in advance and prepare for the needed order at the needed time. This strategy has been adopted by Dell Company in sharing its full inventory information with their suppliers, since they don't believe in protecting their information while they can use them for better performance *(Magretta, 1998)*.

Adopting e-procurement software had resulted benefits to Kell & Rigby mainly in cost and time savings. In year 2001, the e-commerce operation had yielded net benefit of $41,225 to the company, with total cost savings of $442,000 and total ongoing e-commerce costs of $400,775. The savings were in the area of paperwork, traveling costs, brochures, printing and photocopying, etc.

Other results are improving staff productivity and efficiency, attaining competitive prices, locating proper suppliers and enabling suppliers to publish their advertising information within the system.

These benefits and more were discussed by several researchers. *(Presutti Jr. 2003)*, for example, has discussed certain benefits of e-procurement such as the ability of suppliers assessment due to the availability of electronic information about them, reducing costs of materials due to competition, reducing inventory costs due to the supplier involvement in inventory control, and finally enabling exchanging information about orders, deliveries and product in real-time.

Such benefits were also discussed by *(Lancioni et al. 2003)* and *(Davila et al. 2003)*. While (Muffatto and Payaro 2004) have added the benefits of reducing mistakes, shortening the purchase cycle time, inventory control and giving advantage for suppliers with better products quality.

Several challenges face an e-procurement software implementation. Adopting such software needs a large investment, as *(Davila et al. 2003)* has advised small companies to adopt simple procurement technologies rather than software.

Kell & Rigby has invested in the e-procurement software about $185,500 and recorded ongoing costs in year 2001 of about $400,775 which matches the previous opinion of *(Davila et al. 2003)*. But according to the positive net benefit resulted in that year, it can be concluded that Kell & Rigby have overcome this challenge.

Another challenge faced Kell & Rigby was the resistance of the staff to use new internet-based software. The company solved this problem by gradually implementing the system and conducting training courses to the staff. Other solutions can be added to such a situation, suggested by *(Davila et al. 2003)*, such as; convincing the new users of the benefits they would gain from using the software. For example, how applying the supply chain processes will become easier by using the

software. Also, they should be convinced that using the system doesn't need high computer skills that can't be attained by simple training. Finally, besides staff, suppliers using the software should be confident that their private information is secured.

A broader challenge faces the e-procurement software, according to *(Davila et al. 2003)*, which is the need of integration of the software with other internal systems in the company and external systems in the suppliers' side. This problem wasn't explicitly pointed to in the case study, so the author can conclude that it has been managed.

A final important issue concerning the upstream supply chain is the company's relationships with its suppliers. (*McIvor 2000)* has emphasized on the importance of building solid relationships with the key suppliers, by involving them in the product development or design, collaborating with them to adopt integrated business processes and sharing useful information with them.

9Stuart and McCutcheon 2000) have described three forms of suppliers relationships; the first one is the competitive tension relationship, which is based on suppliers competition to gain the purchase order, which is the case in Kell & Rigby. The second form is the strategic alliance relationship, which allows a full involvement of the supplier in a certain product or a component; it even may let the supplier to provide the design of this product. An example of such alliance is Dell Company and Sony. According to (Magretta 1998) Sony is the sole provider of Dell Computers monitors. The relationship between them had reached to far boundaries, since Dell doesn't check on monitors provided from Sony before delivering them to customers.

The final form of relationship is the cooperative partnership. This relationship is temporary. The buyer may find sides to be enhanced in a product provided by such supplier. For strategic reasons, the buyer may not desire to switch to another supplier, so the buyer gets involved in fixing the shortcoming in the current supplier. When this is done, the buyer has to redefine the relationship with the supplier as one of the first two forms.

Downstream supply chain management: Tesco.com case

Downstream supply chain includes processes of the sell-side of the supply chain, containing distributors and customers. *(Chaffey 2011)* has considered outbound logistics and fulfillment as the key activities of this model. Other issues related to the downstream supply chain are marketing and customer relationship management (CRM).

In the case study on hand, the focus will be laid on CRM accomplished by a British retailer company, Tesco. *(Mendoza et al. 2007*) defines CRM as an organization strategy, its aim is customer satisfaction and customer long-term relationships. Any strategic or operational activity related to these objectives is considered a CRM activity. Such activities are; marketing, human resources, sales, customer services and R&D. *(Mendoza et al. 2007)* consider processes, people and technologies as the basic aspects that serve the objectives of CRM.

A case study about Tesco.com is published by *(Chaffey 2011).* In this case study, Tesco has adopted several strategies to support CRM. Tesco is a British food retailer, originally specialized in grocery. Tesco.com is the company's web site developed to perform online selling of grocery. On the year 2005, the profit of Tesco has increased about 37% due to online grocery selling, resulted from the increase of purchase orders received by the site, which were about 170,000 orders in that year. Among its competitors, Tesco leads the grocery retailers in UK in terms of market share. In addition to its lead in the area of online selling and the better performance of Tesco.com than other competitors web sites.

DISCUSSION

Several models describing CRM activities have been described in literature. *(Chaffey 2011)* has described four activities; customer selection, acquisition, retention and extension. (Winer 2001), on the other hand, has described a

CRM model starting with creating customer database, analysis, selection, customer targeting, relationship marketing, privacy issues and finally metrics for customers' evaluation. In this case discussion, the author adopts the activities described by *(Chaffey 2011)*.

Several strategies have been adopted by Tesco to enhance its customer relationships. The first and most important strategy, is the development of Tesco.com as an e-business portal where Tesco performs online selling of its products. With this site, Tesco has converted to what is called e-CRM, which is, according to *(Chaffey 2011)* and *(Feinberg et al. 2002)*, using internet and communication technologies to encourage customers to use their online services and thus extending their customer base and enhance their service quality.

Both *(Chaffey 2011)* and *(Feinberg et al. 2002)* have discussed features and activities performed by e-CRM. For example, online selling, membership, site map, mailing list, search engine, e-mail marketing, online product information. By a quick browsing on Tesco.com, the author noticed many of these activities adopted in the site. A site map provides information for the first-time-user. Products has been categorized and their information are available with searching option is given. Possibility of registering and becoming a member on the site gives a user certain privileges, such as joining the advertising e-mailing list.

An outstanding provided service has been also noticed by the author, which is the comparison of products prices in Tesco with their corresponding prices in other competitors, such as Sainsburys and Ocado. All these services and more attracts the first viewer of the site to become a continuous visitor which achieves one of the activities of CRM, customer acquisition.

Another strategy is the product diversity. They have started as grocery retailers, but now they sell every type of goods, such as books, CDs, electronics, etc. and they even provide certain services such as e-diets. With this strategy, Tesco has achieved the activity of customer selection, since it hasn't limited the target customer in householders and housewives buying grocery, they have targeted different types of customers of different ages.

A service promotion strategy has been also adopted by Tesco concentrating on its existent customer in order to achieve customer retention. It depends on e-mailing offers and promotions to such customers according to their loyalty levels, which are evaluated according to the frequency of purchasing online and the closeness of purchasing periods. A trigger messaging approach is used to send e-mails to customers from his/her first registration with promotions and offers every planned period of time. If the customer performs an online purchase, another stream of e-mails with other types of promotions are sent. To achieve the customer extension, the system starts sending offers on similar or related products or services to the previously purchased ones, to attract the customer to further purchase.

By adopting this e-mailing approach, Tesco either use the Opt-in or Opt-out strategies. By Opt-in, they start e-mailing the customer directly after registration, with assumption of his/her approval. Opt-out, on the other hand, a customer has the right to accept or decline receiving such emails *(Chaffey, 2011; Winer, 2001)*.

In order to enhance Tesco's relationships with customers, improvements on the site have been done to reduce the time spent on entering a purchase order. Also, home delivery of products has become one of the essential services.

A loyalty program has been also applied by Tesco, to reward its frequent purchasing customers with coupons and discounts according to the sizes of their purchases (*Hagel III and Rayport, 1997)*. Such programs increase loyalty of customers by increasing their satisfaction with the services provided. According to *(Heskett et al. 1994)*, a customer loyalty would eventually be translated into profit, since a loyal customer is more convinced with the prices offered and is a good advertiser of the services provided. Loyalty programs, on the other hand, could be expensive and if a mistake occurred, it can't be correctable, since gifts cannot be refundable, and finally they

can't guarantee customer loyalty after all (Winer, 2001).

Finally, customers are the most important investment for a company, and retaining good relationships with them returns great benefits, and accordingly, CRM implementation has many benefits and value added to the company and the customers, especially when e-business technologies are used.

Such benefits are; lowering costs of advertisements when using web sites and e-mails, which also allows rapid interaction with the customers and thus better relationships. Other benefits like increasing in profitability, customer satisfaction and retention, increasing in productivity, enhancing customer services through better communication and understanding of customer requirements *(Chaffey, 2011; Winer, 2001; King* and *Burgess, 2007)*.

Impact of e-business on supply chain management

In the previous two sections, benefits of applying e-procurement and e-CRM systems were discussed. In this section the general benefits of applying e-business solutions on the supply chain are discussed.

Researchers have agreed on cost reduction as the most important impact of e-business. (*Alberta Efuture Center 2011*) has included it in general, while *(McIvor 2000), 9Muffatto and Payaro 2004)* have specified cost reduction in inventory, setup, operational and switching suppliers costs. *(Lancioni et al. 2003*) have considered cost reduction in transportation and logistics operations.

Other impacts like flexibility in products and information movements between the business partners *(Alberta Efuture Center, 2007)*, speeding of supply chain processes like ordering, delivery and payment due to cancellation of paperwork and unnecessary operations *(McIvor, 2000)* and flexibility in creating relationships *(Muffatto and Payaro, 2004)* were also discussed as time and cost savings.

E-business solutions have added value to relationships with customers and suppliers, by introducing better services and increasing collaboration among them which is resulted from the better integration between the business partners. In addition to flexible information sharing that enables demand forecasting and inventory control *(Alberta Efuture Center, 2007; Sanders, 2007; Lancioni et al., 2003; Muffatto and Payaro, 2004).*

Finally, it can't be neglected that e-business has affected organizations and staff. E-business evolution had created new concepts as e-procurement, e-logistics, e-marketing, e-CRM and others. These electronic applications have participated largely in the development and enhancement of the supply chain activities, in addition to increasing productivity and efficiency of company's staff due to the new skills learned *(Chaffey, 2011; Lancioni et al., 2003).*

CONCLUSION

Supply chain management is an essential concept in the world of integrated and interacted businesses. With both models of supply chain, upstream and downstream, a company concentrates its efforts on enhancing either its buy-side suppliers activities, or its sell-side customers activities, respectively. With the emergent of e-business, these activities has been enhanced to become more effective, productive and more valuable to the entities in concern.

In the discussion of both case studies of Kell & Rigby as an upstream supply chain conductor, and Tesco.com as a downstream supply chain conductor, the main and shared concern was to develop and enhance the processes in the corresponding supply chain to achieve satisfaction of the company, its suppliers and customers to reach the needed collaboration among all of them.

The researchers recommend paying full attention to the small details and differences in these two streams of the supply chain, whenever needed to be implemented. A company should notice that dealing with variable and large number of customers will surely need different strategies

than dealing with suppliers, especially the ones who are considered as long-term strategic partners. But, both ends of the supply chain have one thing in common, which is the need of trust. A customer needs to trust the quality of service provided from a company, and a strategic partner supplier needs to trust the commitment of the same company.

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