

Enhancing Accounting Information Systems to Facilitate Supply Chain Management between Supermarkets/Suppliers: The Case of Saudi Arabia

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Abstract

Supply chain management is one of the most powerful determinants for creating competitive advantages for companies. In today competitive environment, companies strive to respond and offer its services faster to the market. The market of information technology is huge and expanding. Cloud computing is changing the way organization activities are performed including finance, accounting and supply chain management. The value of companies depends on events that occurred daily and the lag and gap in responding is increasingly making companies less effective. The application of information technology is prominent in the improvement of the supply chain. The main goal of supply chain activities is to satisfy customers' demand, so that products are distributed with the lowest possible cost, highest quality and within the time deemed suitable for customers which is the recent challenge. The ability to produce quality information and accessing it will become crucial aspect in the new world. Technology will help to control business and companies will manage better their relation with stakeholders. We aim to explore the relationship between retailers and suppliers in Saudi Arabia Market and their sharing of information regarding stock levels to improve supply chain management. The integration of information in processing orders from supermarkets to suppliers is going to be investigated in order to improve supply chain management.

Keywords: Supply chain management; Accounting information system; Saudi Arabia

Supply Chain Management as a Crucial Organization's Function

Supply chain management is essential in today's world for companies' success. In addition, many organizations are becoming more involved in strategic alliances, networks and virtual relationships. It is an activity that requires managing raw materials until delivering to customers. According to Li et al. [1] as companies are focusing on satisfying customer demand, while reducing managerial control of daily logistics operations. Less control and more supply chain partners led to the creation of the concept of supply chain management. The purpose of supply chain management is to improve trust and collaboration among related parties, thus improving inventory management.

Companies often want to create a closer relationship with suppliers in order to reduce the cost of the products they buy, shorten lead-time, and improve quality and enhancing the service level. Simchi-Levi et al. [2] argued that supply chain management requires managing supply chain in order to allow goods to be produced and distributed at the right quantities, to the right locations, and at the right time, in order to minimize costs while satisfying customers. Supply Chain Management can be critical to customer satisfaction and enhancing companies' position. Supply chain management is critical to business operations and success. It has great impact on companies' profitability and firm's value because they decrease in the use of large fixed assets such as plants, ware houses and transportation vehicles in the supply chain can decrease expenses and ultimately enhancing profitability. The availability of products to customers and more responsive to their needs can boost sales revenues. Also, cash flow can increase because if delivery of the product can be accelerated, accounts receivable turnover will be faster. Information sharing among firms along supply chain plays a vital role in supply chain management [3].

This paper aims to explore the nature of collaboration between Saudi supermarkets and their suppliers, and the degree of operational and information integration internally and externally if there is any. An exploratory case study approach is carried out to provide a better

understanding the relation between retailers and suppliers in Saudi supermarkets.

Computerized Accounting Information System Role in Supply Chain Management

Computerized accounting information system is a computer-based method for tracking financial transactions based on information technology resources. The system is responsible for processing financial data that can be used for internal and external decision making. The success of accounting in the last five centuries and its prominent position during and after industrial revolution is in the last decade and afterwards being tested and became a controversial issue among academics, accountants and users who are the customers of accounting information. Customers of accounting information are no longer satisfied and are looking for other sources of information which are comprehensive and solid [4]. The traditional accounting and financial system are suitable when companies are striving for cost efficiency in a stable market. By providing information related to elements of production with variance analysis reports, managers were able to take operational decisions in the age of industrial economy [5]. The value of companies depends on events that occurred daily and the lag and gap in reporting it is increasingly making accounting reports less useful. Supply chain management is crucial in today's world for companies

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success. In addition, regardless of the size or sector of organizations, many companies are becoming more involved in strategic alliances, networks and virtual relationships. Requirements of reliable and on-time information are a must not an option. Supply chain management can benefit from management accountants as they can help analyzing key performance indicators and costing information to recognize inter-organizational relationships and contribute to cutting costs and enhance value. The Management Accounting Committee (MAC) of the Institute of Management Accountants [6] in its statement of the need of integration between retailers and suppliers provide example about Wal-Mart and its way of integrating suppliers into a network responsive to a defined vision of customer values.

Management accounting expertise can help supply chain management through a number of ways including reporting and improving financial and non-financial performance management across the supply chain, and improving performance through the use of technology; using management accounting tools at different stages of developing supply chain relationships; supporting and promoting sustainable distribution; facilitating trust among collaborating organizations and supporting partnership throughout the supply chain [7]. Munteanu [8] argued that supply chain management includes coordination and collaboration with different partners, which can be suppliers, retailers, and customers. In general, integration is vital between different parties involved in supply chain. Supply chain management can be viewed as an integrating function, which should be connected to other business functions and processes within and outside companies. Creating value through supply chain requires proper flow of information. He states (p.514, original emphasis):

When we speak of the information needs of Supply chain management, we think, in a first stage, of the information on providers, customers, distribution networks, etc., and we must take into account that their essence consists, in most cases, of quantitative information that, to a great extent, comes from accounting. Using past events recorded at present, we can obtain certain data on costs, stocks, debts, and recorded results, and we can make predictions and design strategies for the future.

In order to improve company performance, integrated supply chain cost management is considered important. For accounting and supply chain to get such a view, management accounting systems should be able to measure costs at the level of individual activities and calculate total costs along activity chains, across the different responsibility centers and legal entities. Activity-based costing could do the job [9].

Sutton et al. [10] argued that today's business environment is not only about cost reduction or quality but about more response to customer's needs. It is a competition between supply chains with an organization's success depends on the viability and success of its supply chain partners as much as, or more than, enterprise policies and decisions. There is a need for systems to connect supply chains. Still, the current accounting model fails to recognize the complexity of this new reality. Failure to effectively integrate policies for trading partners and to secure information across the supply chain can cause a number of risks for companies. They provide example about Cisco Company which built its success on outsourced manufacturing and growth through acquisition and the failure of the company in 2011 by stating (p.6):

Two of the more publicized failures were Nike and Cisco Systems. Nike's crisis came in May 2001 when reported sales for the prior quarter had to be reduced by \$100 million because of confusion in its

supply chain. Cisco Systems experienced an even bigger hit when \$2.2 billion was written off for unusable inventory resulting from problems in the supply chain.

Sacer and Oluic [11] argued that accounting information system is important in preparing quality accounting information. The application of information technology impacts the operations of organizations. Organizations need to fully understand the role of technology on organizational process. Accounting information system backed by suitable information technology is cornerstone in new knowledge economy. Accounting in the new environment is not going to be the same. Financial accounting needs to be more responsive to stakeholder's needs of information while management accounting need to be more integrated in management process. Accountants are trying to amalgam financial and non-financial information to satisfy various needs. Management accounting moved from cost determination and financial control to create value by participating more on organization's decision making process and strategy formulation. It is in this environment where accountants act as advisors with multidisciplinary skills. He must be knowledgeable, ethically responsible and equipped with highly professional skills [5]. Stede and Malone [12] pointed to the changing role of accountants and financial professional. Accountants are more likely to add value and support management in their companies instead of the traditional accounting responsibilities and to be more involved in its future direction. They must be highly professional and equipped with information related to risk management, financial instruments and cash flow.

Next section is going to explore the status of information technology in Saudi Arabia and how advances in information technology infrastructure can facilitate the integration of information.

The Status of Information Technology in Saudi Arabia

The role of information in the new economy is paramount. Technology, globalization, intangible assets, and communication are impacting and shaping our world. The ability to produce quality information and accessing it will become crucial aspect in the new world. Technology will help to control the business and companies will manage better their relation with stakeholders. Companies must think of ways to make their processes more flexible [13].

The first appearance of internet technology in Saudi Arabia was in 1994 where it made its first appearance in educational, medical and research institutions. It became available for public use in 1999. The number of Internet users in 2001 was one million and had increased to 11.03 million by the end of 2010 with an annual average growth of 31%. By the end of 2010 40% of the populations were using the Internet. It is nearly 70 % of the Saudi populations are aged less than 30 years in 2007. Generally, the spread in use of the Internet by Saudi companies increased from 59% in 2008 to 65% in 2009. In detail, 85% of large companies had an Internet connection, 75% of medium companies used the Internet technology, whilst the 58% of small companies had internet. Furthermore, 69% of the firms in 2009 used the Internet for business [14].

According to CITC [15] (Communication and Information Technology Commission) by the end of 2014, the number of subscriptions to fixed broadband services had increased 3 million, representing 54% of households, and total mobile broadband population penetration had reached 94.5%. Internet penetration increased rapidly over the past years; it rose from 13% in 2005 to about 65.5% at year-end 2014. The number of Internet users in the Kingdom is currently estimated at about 19.6 million. An increase in demand

for Internet services and broadband was observed recently with greater use of social networking channels, resulting in users seeking higher speeds and greater bandwidth. The amount of data used also increased dramatically in the past few years. The following figure shows the growth of internet users 2001-2010 (Figure 1).

This increasing in the number of Internet users for different factors. Firstly, after 2005 the Saudi government allowed more operators to work in the market and provide the Internet services and they are overseas firms. Secondly, because of oil prices increasing, the Saudi government increased the wages for the employees in the government as well as the increasing in the allowance and benefits. The following

graph highlights growth in total subscriptions to mobile services in Saudi Arabia from 2007-2014 (Figure 2).

Brinkley [16], pointed to the characteristics of knowledge economy and knowledge organization, it is an economy where knowledge is diffused in all sectors not just some industries. Work in organizations is organized to store and share information through knowledge management practices. An organization that manages for stakeholders allocates more resources to satisfy the needs and demands of its legitimate stakeholders than would be necessary to simply retain their participation in the organization’s productive activities. Organizations that manage for stakeholders develop trusting relationships with

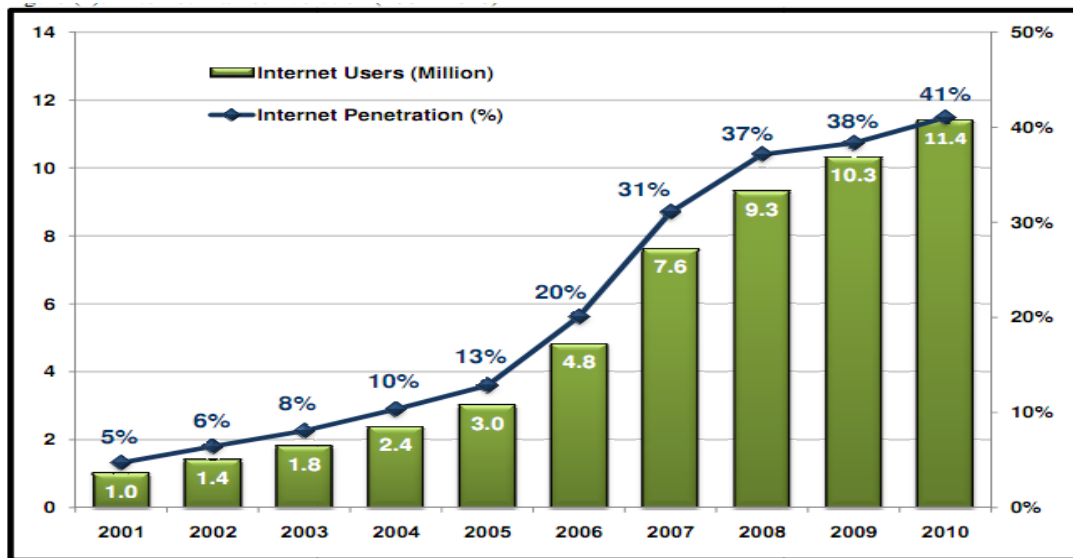


Figure 1: Number of Internet users in Saudi Arabia (2001-2010).

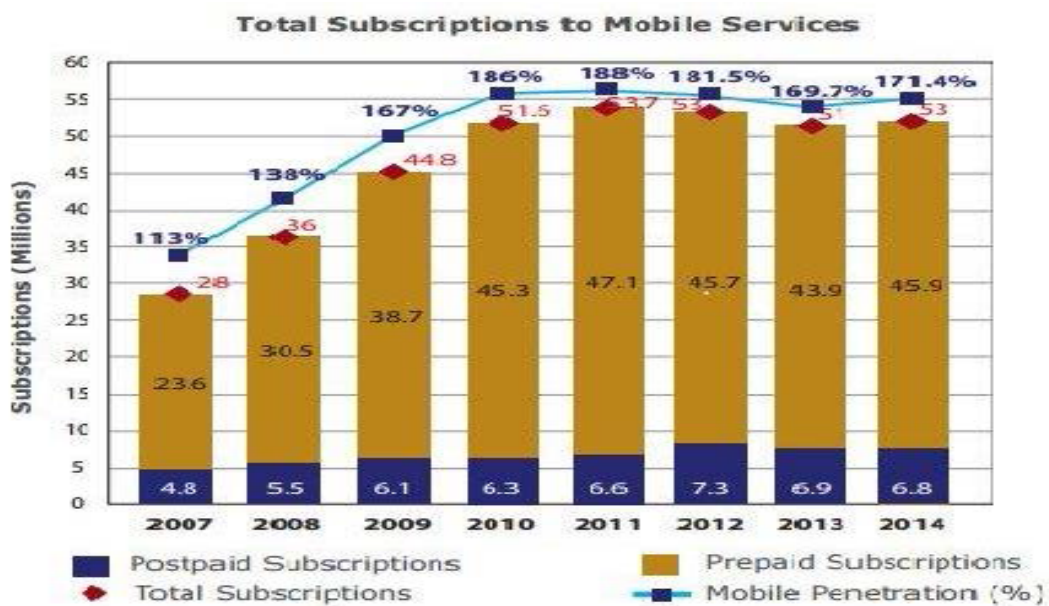


Figure 2: Total subscriptions to mobile services in Saudi Arabia (2007-2014).

them. Under these conditions, stakeholders are more likely to share information regarding their utility functions, thereby increasing the ability of the firm to allocate its resources to areas that will best satisfy them.

Cloud computing has become a trend that gained popularity in recent years. It changed the traditional computer business schemes from static, centralized and closed systems to a more comprehensive, timely and dynamic model. Accounting information system is a tool that helps companies in running its business model [17]. It is used daily to provide information for decision making in various organization activities such as production, human resources, finance and supply chain management. In order to integrate business, an emerging technology known as cloud computing might be the answer to these concerns, since it is related to share computing resources between companies, providing a common interface to all users at the same time [18]. Kinkela [19] argued that cloud computing technology allows software and data to be managed offsite. It causes a huge cost benefits and efficiencies. In this case, computing resources may reside in a technology center shared with other organizations and managed by a third-party vendor. Mattison and Raj [20] identify three factors as a determination of the fit of cloud computing with ERP. They are the size of company's revenue, the geographical area of its operations, and the industry sector in which business operates. Cloud-based ERP offers smaller and mid-sized enterprises significant greater benefits in terms of cost. Jia [21] promoted the integration of conventional ERP system with cloud services as a solution that takes advantage of cloud services with lower investment, especially for the enterprises that have been running ERP systems for years.

Next section is going to shed light about the development of supermarkets industry in Saudi Arabia.

Saudi Arabia Supermarket Industry

The retailing sector in Saudi Arabia is one of the fresh and fastest growing sectors from a consumers demand perspective. Consumers now prefer to shop at modern supermarkets and hypermarkets for different reasons. Firstly, young people in general have developed a Western shopping where they prefer shopping from supermarkets. Secondly, old people prefer supermarkets because they are convenient. Thirdly, they are considered as a place for family entertainment due to the conservative nature of the Saudi community as supermarket have playground areas that lead to allow parents to shop whilst their children are entertained [22]. In contrast of old people preference of supermarkets, young Saudi population prefers to shop online. However, the development in the online retail is slow due to many obstacles such as:

The reasons why online sales could pick-up are the convenience that it provides in receiving goods at home and it allows women to carry out purchases from the comfort of their home. Other reasons for limited development of online or e-commerce transactions in the Kingdom are:

- Lack of proper infrastructure (no secure payment gateway mechanism, lack of multiple payment options, limited technical knowledge to design e-commerce platforms, etc.).
- Non-availability of an efficient delivery system (the current postal system uses P.O. Box systems rather than postal addresses and the new Wasel service, which uses geographic information systems (GIS) covers only 2% of the Saudi population).
- Legislations regulating e-commerce retailing are still under development.

There were 32,000 food retailing shops in Saudi Arabia; of these supermarkets accounts for only 1%. In addition, the largest food producer sells only 4 % of it produces to these supermarkets. Compared with supermarkets in the west, Saudi supermarkets are very limited in providing special promotions to their customers, such as, loyalty cards or facilities such as online shopping. To give an example of the performance of Saudi supermarkets, we will refer to the annual report from one of the largest supermarket chain in Saudi Arabia, Al-Azizia Panda. Total sales in 2012 were 9.5 billion SAR and the growth ratio was 12% that is well above sector growth. Over 86 million customers visited their 161 branches. Their market share was 7.7% in 2012 and expected to be 8% in 2013 [23]. This in comparison to western based and managed supermarkets, such as Carrefour, which have grown at rates of 11% and 7% respectively between 2007 and 2012.

Al-Rajhi [22]and Euro-monitor research suggests that in 2010, the annual growth for small grocery retailers was 3.2%, Supermarkets 4.4% and Hypermarkets 7.2%. whereas market share of Hypermarket is the least of them by only 16%, and supermarket share was 24% and finally the small grocery retailers is 60% because of their large number [22] (Figure 3).

In order to explore the nature of collaboration between Saudi supermarkets and their suppliers, and the degree of operational and electronic integration if there is any, structured interviews were conducted with eight retailers who belonging to supermarket or hypermarket chains who represent the major players in the market. The interviewees were purchasing department managers and CEO's. In addition, four suppliers participated in the structured interviews. This method enabled the extraction of the required information. The advantage of using this method is that the researcher can obtain data directly from their sources.

Saudi Arabia Supermarkets/Suppliers Integration Case Study

This section is exploring the integration between Saudi supermarkets and their suppliers. It considers information gathered through structured interviews with the top management of both retailers and suppliers. The structured interview technique was used to cover the gap in the literature in order to identify the level of integration in information systems among retailers and their suppliers. In addition, this part of the study attempts to identify the barriers/enablers to this integration. The structured interview investigated three major areas:

- General information about retailers and suppliers such as the annual income, number of branches, and any other related information.
- The second part of the structured interview concerned information systems used internally (between the branches and head office) and externally (supplier-retailer information exchange). It also considered information system budget, renewal and updating plans and the level of involvement of the system users in determining the features required when buying a new information system.
- Thirdly, it investigated the behavior of Supply Chain Management from different perspectives. These concern the nature of communications between suppliers and retailers, product stock levels, product quality checking, and payment to suppliers that affect SCM performance.

The sample consisted of eight retailers and four of their food

suppliers. The retailers were the biggest retailers in the Kingdom of Saudi Arabia. They had supermarket chains and hypermarket chains distributed across the country in five regions; the central region, west region, east region, north region and south region. Seven of the interviewees were purchasing managers for supermarkets chains. One interviewee was chief executive officer and board member of one of the supermarket chains. Seven of the supermarkets had their main office and central department situated in Jeddah; the other was located in Riyadh the capital of the Saudi Arabia (Table 1).

Interviews were also carried out with four suppliers. They were all food suppliers to the supermarkets and to other kind of retailing outlets such as, corner shops, mini markets and the wholesalers. In addition, these suppliers had distribution channels that covered all regions in

Saudi Arabia. The reason for using food suppliers was to examine the behavior of products with fast movement and high consumptions rates where shelf life is a key issue. From the interviews, the researchers tried to identify the general operational culture of each organization and how they viewed their suppliers; the same approach was followed for the suppliers. Table 2 presents the annual turnover for each supplier interviewed with and the products are producing.

In case of internal communication, the answers received from the retailers showed that all of them were using e-business tools on a daily basis to manage stock level, schedule tasks, inventory, and financial transactions. This indicates that all retailers were using electronic applications to organize their work irrespective of what size their daily activities are as shown in Table 3.

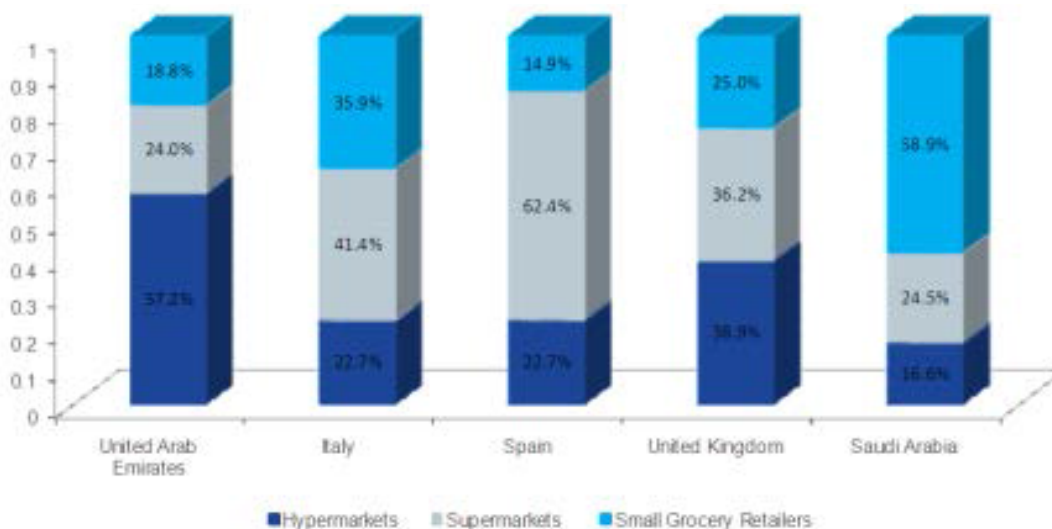


Figure 3: International Retailing distribution: Hypermarket vs. Supermarket vs. Small grocery retailers in 2013.

Chain Group	Number of branches
A	100
B	166
C	20
D	25
E	6
F	18
G	15
H	8

Table 1: List of supermarket chains interviewed ranked by number of branches.

Supplier	Products	Turnover
W	pastries, dry ice, pizza, meat, fish and ethnic food	SR 1 billion
X	pastries, frozen vegetables and ready meals	SR 70 million
Y	milk, cheese and fresh juices	SR 1 billion
Z	local sweet producer	SR 1 million

Table 2: Suppliers turnover.

Internal application	Retailers							
	A	B	C	D	E	F	G	H
Managing the stock	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Task scheduling	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Inventory	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Financial transactions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 3: Internal method of communication.

The second form is external communication. Table 4 shows that the retailers do not have electronic communication systems in place that to allow suppliers to access retailer’s system to check stock level or for completing financial transactions.

The communications with suppliers is vital in facilitating relations with supermarkets. Apart from retailers A and B where the main method of communication was email, retailers primarily communicated with their suppliers directly at retail branch level through supplier sales representatives. If a sales representatives could not be reached or is not available then there was an almost equal split between phone and fax as a second alternative and fax and phone as third alternative as shown in Table 5.

From the interviews, it was found that while all of the previous retailers were using the above mentioned methods with their suppliers; however, it could be different from supplier to another depending on the degree of relationship with the supermarket or even the division supervisor, if the ties are strong. In case of supplier dose not turn up to the supermarket to check its product or not supplying and fulfill the orders, retailer will use alternative suppliers for that product. How frequently do you update your hardware (PCs/servers) and ERP software?

Table 6 shows that the retailers A, E and F did not have any set plan to change their software or hardware, whilst retailers C, D, H and G

Method of Communication	Retailers								
	A	B	C	D	E	F	G	H	I
Externally									
EDI System (Electronic Data Interchange)	No	No	No	No	No	No	No	No	No
Internet portal	No	No	No	No	No	No	No	No	No

Table 4: External communications.

Retailer	Method of communication				
	1 st method	2 nd method	3 rd method	4 th method	5 th method
A	Email	Visiting the branch	Online check	Fax	Phone
B	Email	Fax	Phone	-	-
C	Visiting the branch	Fax	Phone	-	-
D	Visiting the branch	Fax	e-mail	phone	-
E	Visiting the branch	phone	fax	Email	-
F	Visiting the branch	phone	fax	Email	-
G	Visiting the branch	phone	fax	-	-
H	Visiting the branch	Fax	phone	-	-

Table 5: Communications with suppliers.

Plan in Years and Budget	Retailers							
	A	B	C	D	E	F	G	H
2	-	✓	-	-	-	-	-	-
4	✓	-	✓	✓	-	-	✓	✓
No set plan	-	-	-	-	✓	✓	-	-
The Budget in SAR	500000	500000	100000	300000	-	-	100000	10000

Table 6: Software and hardware updating time.

planned to update them every 4 year. Furthermore, only one retailer B updated the software and hardware every 2 years. In addition, the average budget varies from 10,000 for retailer H to 500,000 for retailers A and B. It is also noticeable that the two retailers that have no set plans for hardware or software renewal also have no budget allocated for it.

The supermarkets/suppliers relationship and how both sides can manage the stock levels, payments to suppliers, and quality of the products is of a great concern to an effective supply chain management.

The interviews with Supermarkets clarified none of them had an integrated system with suppliers. Although retailer A answered yes, but in effect the system was not integrated. Retailer A only gave large suppliers a user name and password to access the retail website to check and download issued orders and print them. Only two retailers were able to provide information about the number of orders issued each day. Retailer D had 600 orders and retailer E had 200 orders each day while the others did not have information about the number of daily orders as shown in Table 7.

The ability of retailers to identify accurately their current stock levels at each store is in doubt. The responses regarding the availability and shortages of products in the retail stores showed that retailers B, D, E, F, G and H report that product shortages occur occasionally. Retailer A, on the other hand, is a little more interesting as it reports that there are shortages and that some of their stores often run out of stock for perishable goods. In the contrary they report that they never suffer shortages of long life goods, electronic goods, clothing, tools and hardware (Table 8).

From the collected data reported in Table 9, we can see that suppliers depend on regular visit of their sales representatives to the supermarkets to find out stock levels and obtain further orders; phone and fax are also used. E-mails are rarely used. There is no electronic integration in terms of sharing information on stock level and products availability on a daily basis.

The payments arrangements from retailers to suppliers are considered problematic. All of the suppliers present a monthly statement of indebtedness. Suppliers confess that the process can lead to a delay in payment because some retailer’s branches have problems in recording invoices and that the warehouse is unable to assemble information due to workload issues. This only becomes apparent to suppliers when payment is made. It is only then that they discover invoices documentation has either been lost or not acted upon. Suppliers agreed that they try to solve any problems in a friendly way. If that fails to settle they can always go to court. In addition, if retailers default with bank refusing to pay out due to lack of credit, for instance then the supplier can ask the ministry of trade to deal with the case. All suppliers agreed that the relationship is unbalanced between the parties and all power is on the retailer’s side. The main reasons for the poor relationship between suppliers and retailers are due to two main

Retailer	Number of orders per day
A	Information not available
B	Information not available
C	Information not available
D	600 orders
E	200 orders
F	Information not available
G	Information not available
H	Information not available

Table 7: Number of daily orders.

Retailer	Perishable goods	Short life goods	Long life goods	Electronics	Cloths, tools and hardware
A	Yes	sometimes	No	No	No
B	sometimes	sometimes	sometimes	sometimes	sometimes
C	sometimes	sometimes	sometimes	sometimes	No
D	sometimes	sometimes	sometimes	sometimes	sometimes
E	sometimes	sometimes	sometimes	sometimes	sometimes
F	sometimes	sometimes	sometimes	sometimes	sometimes
G	sometimes	sometimes	sometimes	sometimes	sometimes
H	sometimes	sometimes	sometimes	sometimes	sometimes

Table 8: Product shortages and availability.

Supplier	1 st method	2 nd method	3 rd method	4 th method
W	By regular visit to retailer	Phone	Fax	e-mail
X	By regular visit to retailer	Fax	Phone	e-mail
Y	By regular visit to retailer	Phone	Fax	e-mail
Z	By regular visit to retailer	Phone	Fax	e-mail

Table 9: Supplier/retailer method of communication.

Supplier	Main Cause of Conflict
W	Retailers are paying suppliers late
X	Retailers are paying suppliers late
Y	Retailers are paying suppliers late; we are not supplying them on time either
Z	Retailers are paying suppliers late; we are not supplying them on time either

Table 10: Causes of conflict between suppliers and retailers (supplier's views).

reasons: late payment and failure to deliver on time (even though the penalty for late delivery is written into contracts (Table 10).

Conclusion

In today's competitive environment it is no longer enough to integrate only operations, internal infrastructure with the company's competitive strategy but organizations that better integrate internal processes with suppliers in order to build effective supply chains is necessary. Supermarkets in Saudi Arabia need to move away from the current means of communication to a more effective model. The late payments to suppliers and failure of delivery of goods to customer's on-time can have a tremendous impact for customer's satisfaction in Saudi Arabia. Solutions are needed for a more integrated system. The transformation here could see the introduction of electronic systems that simplify and speed up the communication process. An information system for managing the supply chain being used through the cloud would enable this business model in a more simple way and especially with greater flexibility. Allowing sharing of information in an integrated system is a cornerstone to improve Supermarkets/Suppliers relation towards more efficient supply chain.

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