

Demand Chain Management: Enhancing Customer Lifetime Value Through Integration of Marketing and Supply Chain Management

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Marketing combined with dynamic Supply Chain Management (SCM) provides greater flexibility to satisfy customer demand based on the needs of individual customers and their value to a firm. Marketing focuses on demand creation, while SCM on demand fulfillment. To be successful, the organizations not only need to focus on the supply chain, but also on the demand chain. Demand Chain Management (DCM) provides the alignment of demand creation and demand fulfillment processes across functional, organizational and inter-organizational boundaries. DCM can leverage the strengths of marketing and SCM and meet the challenges of customer value creation in today's marketplace. DCM provides competitive advantage to the firm by enhancing its supply chain's ability to focus on and respond to changes in customer demands. This paper introduces DCM as a model which combines the strengths of marketing and SCM and provides conceptual frameworks and models for implementation of DCM. It emphasizes the role of DCM in enhancing customer-value creation reflected in terms of Customer Lifetime Value (CLV). It also provides a methodology for measurement of CLV envisaged on DCM initiatives by firms.

Introduction

Supply Chain Management (SCM) refers to all of the processes, technologies and strategies that together form the basis for working with internal and external sources of supply. SCM requires integration and coordination of business processes throughout the supply chain for the purpose of satisfying and responding to changes in the demands of ultimate customers (Vokurka and Lummus, 2000). As SCM focuses on the efficient matching of supply with demand, it does not help the firm to find out what the customer perceives as valuable, and how this customer-perceived value can be translated into customer-value propositions. Hence, supply chain efficiency by itself will not increase customer value and satisfaction (Rainbird, 2004a). Supply chains capable of implementing and executing an integrated and coordinated marketing strategy at the supply chain level focused on the ultimate customers of the supply chain will gain competitive advantage (Min and Mentzer, 2000).

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Supply chains have been very efficient at moving products to consumers, but supply chains need to progress towards effectiveness. Hence, everything that is produced, moved, or handled across supply chain should be in response to a known customer requirement. Deployment of a differentiated supply chain strategy is one way for the organizations to make sure that highly varying needs of markets are met at the same time as economies of scale are maintained (Hilletofth *et al.*, 2009). When developing a differentiated supply chain, SCM not only focuses on cost efficiencies (how can firm achieve a lower cost per item), but also on effectiveness (is firm distributing products to specific customer needs at a profit maximization price).

Since consumers are the focus of firm's value chain's existence, consumer demand should be at the core of its business strategy. In doing so, the supply chain transforms itself into the so-called demand-driven chain (Langabeer and Rose, 2002) or, simply, a demand chain. It means that the organizations, instead of employing a traditional "one-size-fits-all" supply chain strategy, develop several supply chain solutions, each one appropriate to a specific product or market condition, by combining different supply and distribution strategies.

Marketing combined with dynamic SCM provides greater flexibility to satisfy customer demand based on the needs of individual customers and their value to a firm. To be successful, the business organization not only needs to focus on the supply chain, but also on the demand chain. Hence, Demand Chain Management (DCM) provides competitive advantage to the firm by enhancing its supply chain's ability to focus on and respond to changes in customer demands.

The objectives of this paper are—first, to introduce DCM as a model which combines the strengths of marketing and SCM by shifting the focus to the customer and designing customer centered supply chains; second, to demonstrate how DCM can leverage the strengths of marketing and SCM and meet the challenges of customer-value creation in today's fast changing and highly competitive marketplace; and third, to suggest conceptual frameworks and models for DCM and provide methodology for measurement of customer-value creation in terms of increased Customer Lifetime Value (CLV) envisaged on DCM initiatives by firms.

Literature Review

In the past decade, business has learnt that the supply chain can be made more efficient in order to decrease lead times and related sales forecast errors. But now focus is shifted on knowing about consumers' desires in order to decrease costs related to forced markdowns or stockouts. As customers are increasingly becoming more demanding, firms place more emphasis on customer service. Achieving better levels of customer service requires working together across different departments or functions of a firm (Ellinger, 2000). Cost efficiency is the most cited goal in SCM according to Wang and Wei (2007). The notion that an effective supply chain alone will ensure adequate end customer satisfaction by reducing costs and therefore prices is not necessarily an adequate model by itself.

High-speed, low-cost supply chains are unable to respond to unexpected changes in demand or supply. Efficient supply chains often become uncompetitive because they do not adapt to changes in the structures of markets. Supply chain efficiency is necessary, but it is not enough to ensure that firms will do better than their rivals (Lee, 2004). SCM focuses on the efficient matching of supply with demand but does not help the firm to find out what the customer perceives as valuable, and how this customer-perceived value can be translated into customer-value propositions. This suggests that a purely mechanistic supply chain approach entirely driven by cost efficiency needs to be replaced with a broader view of overall effectiveness. Hence, SCM efficiency by itself will not increase customer value and satisfaction.

Providing customer service in the value chain is largely the domain of two functional areas—marketing and SCM. Collaborative integration between a firm's marketing and SCM functions is necessary to fully capitalize on potential service improvements (Christopher, 1993; Bowersox *et al.*, 1995; and Mentzer and Kahn, 1996). In short, collaborative integration is how well departments work together when their jobs require them to do so. Thus, collaboration between departments is often needed to ensure delivery of high quality services to customers, and involves the ability to work seamlessly across the “silos that have characterized organizational structures” (Liedtka, 1996). Collaborative behavior is based on cooperation (willingness), rather than on compliance (requirement). Its success is contingent upon the ability of individuals from interdependent departments to build meaningful relationships (Tjosvold, 1988).

SCM requires integration and coordination of business processes throughout the supply chain for the purpose of satisfying and responding to changes in consumer demand. The efficiency of supplier relationship is influenced by nature and frequency of information sharing among functional areas (Lambert and Cooper, 2000). Gundlach *et al.* (2006) argued that the integration and coordination of marketing strategies across the supply chain offers “continued opportunity” for cross-disciplinary research. The ability to integrate and coordinate becomes paramount in satisfying the demands of the ultimate customers of the supply chain (Green *et al.*, 2008).

As customer needs are ultimately seen spinning around reduced price as a major determinant of satisfaction, supply chain efficiency is mistaken for effectiveness, with undue short-term emphasis on cost reduction at the expense of broader and long-term business goals (Walters and Rainbird, 2004). SCM evolved from a traditional focus on purchasing and logistics to a broader, more integrated emphasis on value creation. Many researchers argue that SCM creates competitive values through the active involvement of supply chain entities (Jeong and Hong, 2007). Successful SCM initiatives require cross-functional integration and marketing must play a critical role. The challenge is to determine how to successfully accomplish this integration (Lambert and Cooper, 2000). Lummus *et al.* (2003) examined the impact of marketing initiatives on the SCM and demonstrated that not only do SCM actions affect marketing but also that marketing actions can have a significant impact on supply chains.

The guiding principles governing the marketing and the SCM department are significantly different. While the marketing team tries to meet volume and revenue targets, the SCM operations constantly strive to increase capacity utilization, with both entities operating on local optima. As a result, sales forecasts are not in line with the actual demand trend and the supply chain operation is on different lines. This deviation from demand reality leads to scenarios with inventory stock outs or huge inventory pile up (Sarangi and Srivatsan, 2009). Despite strong arguments for an integrated approach, in many businesses, the supply side still seems to be disconnected from the demand side and supply chain managers have only a faint idea of the drivers behind customer demand (Jüttner *et al.*, 2007). Mentzer and Moon (2004) concluded that many firms have failed to realize that supply chain coordination is not possible without an adequate understanding of demand.

The usual conflict between marketing and SCM functions is the one associated with the management of inventory. Marketing prefers high stock levels to guarantee that customer orders are always met, thus improving revenue generation, while SCM strives to keep low stock levels. However, the main business goal of any firm is to create and maximize shareholders value, which actually is a function of revenues, cost and other economic factors. In the present scenario of competitive environment, more and more firms are aggressively searching for competitive advantages in order to get a better position in markets (Madhani, 2011).

The scope of SCM has widened over time from having an intra-organizational focus on logistics to becoming focused on inter-organizational issues including 'all key processes and functions' of the organization (Dubois *et al.*, 2004). SCM includes the coordination and collaboration of processes and activities across different functional areas of the organization. SCM is the integration of these activities through improved relationships to achieve sustainable competitive advantage. It has been suggested that success in today's competitive business environment is largely dependent on the degree to which firms are able to integrate across traditional functional boundaries to provide better customer service (Cespedes, 1996; and Johannessen *et al.*, 1997).

SCM is a system-based approach viewing the supply chain as a whole, looking at inter- and intra-firm operational and strategic capabilities and focused on creating customer value (Mentzer *et al.*, 2001). Theoretically, SCM may be seen as a precedent to DCM as the latter emphasizes the development of actionable strategies based upon customer information which are to be employed by partners in the supply chain (Bustinza *et al.*, 2013).

There is an interdependent relationship between supply and demand: firms need to understand customer demand before they can manage it, create future demand and, of course, meet the level of desired customer satisfaction. Demand defines the supply chain target, while supply-side capabilities support and sustain demand. The focus of supply chain is on supply of materials, while the focus of demand chain is on market demand (Madhani, 2013). The difference between SCM and DCM is: SCM focuses upon the creation of offerings and their transfer, flowing from suppliers to consumers, while DCM is based on identifying customer needs and the transfer of demand signals from the market (Cambra-Fierro and Polo-Redondo, 2008).

According to Vollmann and Cordon (1998), DCM starts with the customers, working backward through the entire chain, to the suppliers of the supplier. Effective DCM maximizes value to the ultimate customers of the supply chain in terms of both satisfaction and a relatively low total cost of the product and/or service. Hence, everything that is produced, moved, or handled across supply chain should be in response to a known customer requirement. SCM focuses on moving products and services downstream towards the customer (Walters, 2008), while DCM attempts to analyze and understand overall demand for markets within the firm's current and potential product range (Langabeer and Rose, 2002). Demand chain design is based on a profound market understanding and has to be effectively managed to meet different customer needs (Agrawal, 2012).

Some internal drivers of DCM adoptions are: first, to gain greater access to new markets DCM allows the firm to achieve real competitive advantage (Vollmann *et al.*, 2000), as DCM satisfies the requirements of the customers in the new markets; second, to achieve internal performance improvement, as DCM reduces variability and eliminates non-value adding activities, which has a bearing on operational performance (Metters, 1997).

There are external drivers also which influence adoption of DCM; for example, the bandwagon effect from competitive organizations that have already adopted DCM and the bullwhip effect, which can be moderated through DCM initiatives by sharing point-of-sales data and alignment of process with final customer demand (Lee *et al.*, 1997).

DCM is a new business model aimed at creating value in today's marketplace and combining the strengths of marketing and supply chain competencies (Jüttner *et al.*, 2007). This paper supports the emerging view that marketing and SCM are highly connected (Madhani, 2010) and are prerequisites for an effective DCM.

Demand Chain Management (DCM)

Marketing is traditionally externally focused and creates customer value, while SCM is inwardly focused and concentrates on the efficient use of resources in implementing marketing decisions. DCM in terms of marketing and SCM integration is hence between those that define demand and those who fulfill it. A number of organizations have focused their efforts on developing sophisticated supply chains such that their managerial focus became myopic, and many lost sight of their markets and their customers, missing the fact that the customers, failing to realize their expectations, switched their loyalties (Walters, 2006). Hence, organizations need to focus on demand chain also along with supply chain.

The demand chain is defined as "the complex web of business processes and activities that help firms understand, manage and ultimately create consumer demand" (Langabeer and Rose, 2002). Baker (2003) emphasizes that managing a demand chain is fundamentally different from managing a supply chain as it requires turning the supply chain on its top, and taking the consumer as the starting point rather than its ultimate destination. Supply chains emphasize the efficiencies in the production and logistics processes, while the demand chain by contrast emphasizes effectiveness in the business. An efficient supply chain alone provides

only half of the solution, hence, complete solution is suggested to be having an effective demand chain also that encourages a strategic approach to market response.

According to Blackwell and Blackwell (1999), the essence of DCM is to define and understand customer demand on a real-time basis followed by rapid response to it. DCM is defined as the task of managing and coordinating the supply chain from the customer to the supplier (Frohlich and Westbrook, 2002). Demand chain design is based on a thorough market understanding and has to be managed in such a way as to effectively meet differing customer needs. According to Vollmann *et al.* (2000), DCM is defined as “a practice that manages and coordinates the supply chain from end customers backwards to suppliers”. Similarly, DCM is conceptualized as “a set of practices aimed at managing and coordinating the whole demand chain, starting from the end customer and working backward to raw material supplier” (Selen and Soliman, 2002). Likewise, Hilletoft *et al.* (2009) defined it as “the alignment of demand creation and demand fulfillment processes across functional, organizational and inter-organizational boundaries”.

From the above definitions, it can be said that, the main difference between DCM and SCM is that in SCM, the process moves from upstream to downstream, with customer needs being estimated from the firm perspective, while DCM takes the opposite approach and moves the process from downstream to upstream. The main stimulus behind moving away from supply chains towards demand chains and DCM has been the shift in power away from the supplier towards the customer (Soliman and Youssef, 2001). The view of the consumer as an integral part of the chain is perhaps the most important issue in the shift from SCM to DCM.

Traditional supply chain processes focus on efficiency to sustain lower costs, while traditional demand chain processes focus on effectiveness and revenue generation with the aim to please customers (Rainbird, 2004b). DCM attempts to capture the proposed synergies between marketing and SCM by starting with the specific customer needs and designing the chain to satisfy these needs, instead of starting with the supplier/manufacturer and working forward (Heikkila, 2002). Such integrated approach of DCM seems mandatory in today's marketplace, where customers have real-time access to information related to their accounts.

Methodology

A two-stage methodological approach is adopted in this paper. The first stage involves development of a conceptual framework for DCM and then establishing its relationship with CLV by developing an integration model for DCM. In the second stage, research focuses on development of a methodology for CLV calculation.

Development of Framework and Model for DCM

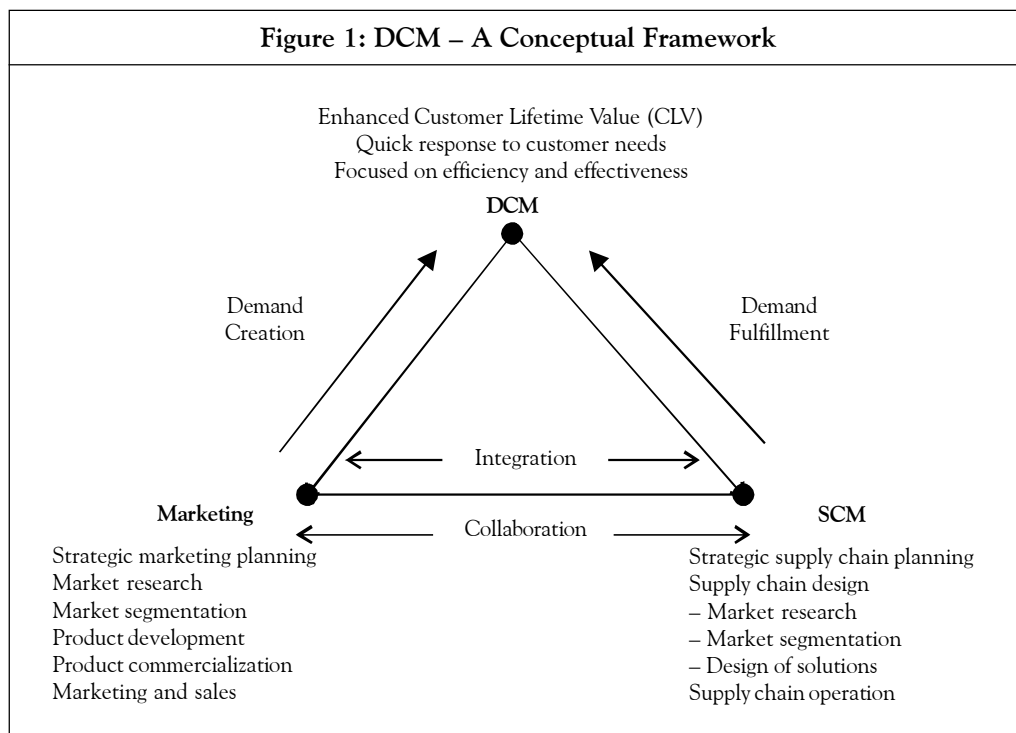
DCM: A Conceptual Framework

The view of the consumer as an integral part of the chain is perhaps the most important issue in the shift from SCM to DCM. The focus of DCM is on real-time flow of demand-related information from the point of inception (end-users) to the point of use (suppliers). Different

customer segments have different expectations and needs to be fulfilled by firms (Robert, 2004). Firms must be market-driven so that they can respond to the market characteristics quickly and proactively (Day, 1999). A market-driven firm has market orientation superior to that of its competitors. Market orientation enhances market responsiveness capabilities of firms (Agrawal and Gupta, 2006).

Although DCM is a relatively new concept, it has already been defined in several ways in the literature. At first, it was introduced as a replacement of SCM and it highlighted issues such as customer focus, market mediation, demand-driven activities and agility by addressing development and management of demand-driven supply chains (Hines *et al.*, 2002; and de Treville *et al.*, 2004). However, these types of issues were also addressed in SCM and therefore there were no major differences between SCM and DCM at the time, and the concept never gained approval in the academic world.

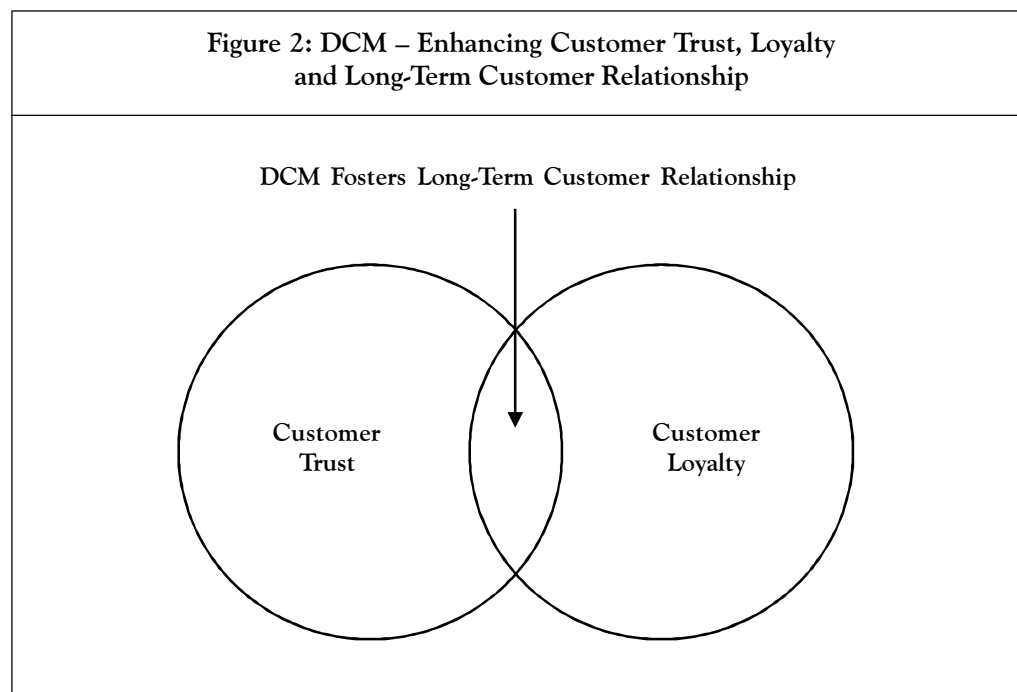
However, more recently, DCM has been introduced as an approach to capture the synergies between marketing and SCM (Walters, 2006). The goal of DCM is to coordinate the demand creation and the demand fulfillment processes to gain competitive advantage by differentiating not only the products but also the delivery process, and to exploit synergies between marketing and SCM. The demand creation processes comprise all the activities necessary for creating demand and are closely linked to marketing, while the demand fulfillment processes comprise all the activities necessary for fulfilling demand and are closely linked to SCM. This implies that a framework of DCM may be constructed based on two interrelated parts: marketing and SCM, as shown in Figure 1.



Marketing focuses on demand creation, while SCM on demand fulfillment, and it is very important that processes in marketing and SCM are coordinated through collaboration. It is also imperative that the demand creation and the demand fulfillment processes are regarded as equally important and this approach also needs to be clearly expressed in the business strategy, otherwise the conventional view, where marketing sets the strategy and SCM executes it, will rule. A DCM approach should incorporate all major demand creation and fulfillment processes within the organization. As can be seen in Figure 1, examples of major demand creation processes are strategic marketing planning, market research, market segmentation, product development and marketing and sales (Kotler *et al.*, 2009), while examples of major demand fulfillment processes are strategic supply chain planning, supply chain design and supply chain operations (Gibson *et al.*, 2005). DCM highlights the interplay between marketing and SCM as an enabler of customer-value creation. The ultimate goal of DCM is to gain competitive advantages by differentiating not only the products, but also the delivery process and to exploit the linkages between marketing and SCM.

DCM: An Integration Model

DCM focuses on meeting customer needs and provides greater value to its customer than competitors. DCM facilitates firms to foster long-term relationships with customers based on customer satisfaction, trust and loyalty (Figure 2). Trust is a cumulative process that develops over the course of repeated and satisfactory interactions with the firm. Customer trust will result in the customer's willingness to develop and maintain a long-term customer relationship with the firm and build solid customer loyalty. Customer trust has a positive correlation with customer loyalty. Loyalty causes customers to buy a particular brand, which



improves the customer's value and ultimately the firm's performance. Customer loyalty can result in favorable operating cost advantages for firms, fewer markdowns, reduction in inventory and simplified capacity forecasting due to lesser fluctuations in demand.

Since customer loyalty is considered to be the complement of trust, the degree of customer loyalty is an important consideration for firms. Customer loyalty has been recognized as an important source of sustained competitive edge in terms of customer retention, repurchase, and long-term customer relationships. Figure 2 shows how DCM builds long-term relationship based on customer trust and loyalty.

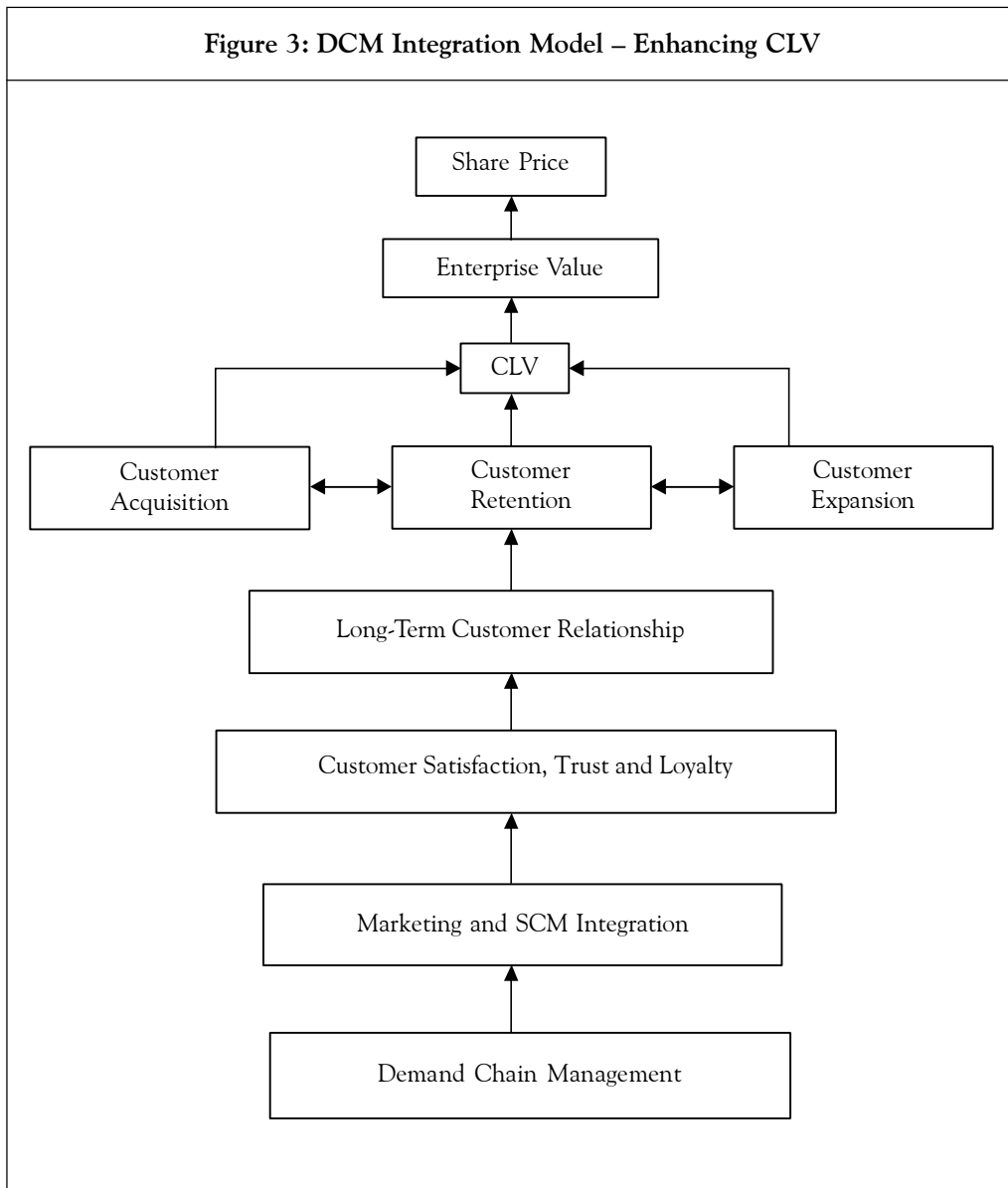
The need to create value in turbulent times has increased demand for new conceptual models and indicators to determine successful measures of marketing effectiveness and SCM efficiency. Customer value is created through well-planned, systematic use of market knowledge to shape flexible logistic and supply chain systems. It is through the effective marketing and efficient SCM integration that customer value is achieved. The customer value is better captured by the metric called CLV. CLV is the only metric that incorporates into one, all the elements of revenue, expense and customer behavior that drive profitability. CLV focuses on long-term profitability instead of immediate sales outcome. CLV depends on three main components of customer relationship—acquisition, retention and cross-selling. This metric also manages to score over other metrics by adopting a customer-centric approach instead of a product-centric one, as the driver of profitability.

CLV is a calculation of projected net cash flows that a firm expects to receive from the customer, adjusted to the probability of occurrence and are then discounted. The lifetime value of a customer for an organization is the net revenues obtained from that customer over the lifetime of transactions with that customer minus the cost of attracting, selling and servicing the customer taking into account the time value of money (Jain and Singh, 2002). Although organizations are interested in knowing the CLV of their customers, they are also keen on identifying the factors that are in their control that could increase the CLV.

Figure 3 describes how DCM initiatives of a firm influence customer behavior (such as customer acquisition, customer retention and customer expansion in the form of cross-selling/up-selling), which in turn affects customers' CLV or their profitability to the firm. CLV of customers (current as well as future) often eventually forms a proxy for firm or enterprise value and share price. Here, CLV is the dependent variable, whereas DCM is an independent variable. Higher CLV reduces uncertainty of future cash flow. Lower uncertainty reduces discount rate and hence results into higher Net Present Value (NPV) (Madhani, 2008). Gupta *et al.* (2004) explicitly confirmed the positive link between CLV and firm value. The CLV of a customer represents the amount the customer will contribute to the bottom line of the firm over the span of the business relationship with them (Kumar and Shah, 2009). Hence, it cannot be seen in an isolated way but rather in the long-term relationship context occurring throughout the customer lifetime.

As the cost of acquiring customers is high, the profitability from a customer arises if customers make many repeat purchases. Customer retention is very much a function of

Figure 3: DCM Integration Model – Enhancing CLV



customer loyalty, and hence, strategies that strengthen the relationship between the firm and the customer should improve retention. Many authors have documented the financial benefits to a firm of increasing retention rates (Gupta *et al.*, 2004). Retention can be increased with better products and services, more competitive pricing, promotions, particularly value-added ones and increased brand value (Malthouse and Mulhern, 2008). Gupta *et al.* (2004) found that increasing customer retention rates by 5% could increase firm's profit by 2% to 9%. As shown in Figure 3, marketing and SCM integration and hence DCM initiatives of a firm enhance customer trust, loyalty and satisfaction, strengthen customer relationship and ultimately increase CLV through customer acquisition, retention and expansion.

Development of Methodology for CLV Calculation

CLV is influenced by retention rate, lifetime revenue of customer and profit margin. CLV provides the present value of a customer relationship over the lifetime with an organization, and is calculated based on the number of sales transactions with customers (Kumar and Rajan, 2009). The retention rate is the probability that an individual customer will remain loyal to the firm for the next period, provided that the customer has bought from the firm on each previous purchase (Dwyer, 1997). Retention rate and lifetime tenure of customers are interrelated and are key drivers of firm's profitability. Retention rate or survival rate of customer is a measure of number of customers remaining in a user group over a specific period of time. Likewise, attrition rate or churn rate is a measure of the number of customers moving out of a collective user group over a specific period of time.

Retaining customers is a crucial function for any firm. Customer attrition impacts a firm in several ways. The primary impact is the loss of revenue from customers who have defected. Second, attrition results in the lost opportunity for the firm to recover the acquisition cost incurred on the customer. Third, the firm loses the opportunity to up-sell and cross-sell to customers who have defected, and this can be treated as a loss of potential revenue. Fourth, there are some lost social effects, such as influencing other customers on product/service adoption and potentially negative word-of-mouth. Further, firms must also invest additional resources to replace lost customers with new customers. This drains the firm's resources, which are already impacted by the loss of customers to competitors and puts an undue burden on the firm to break even (Kumar and Rajan, 2009).

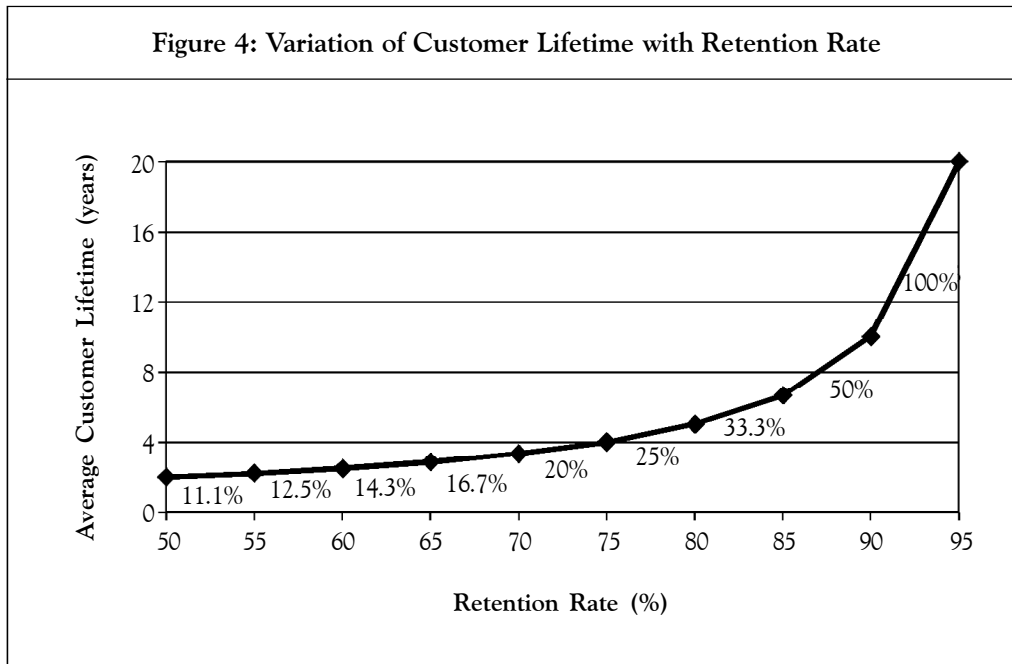
Customer churn can have an adverse effect on the profitability and even the survival of a business. An annual churn rate of 25% is the same as an annual retention rate of 75%, i.e., on an average, 75% of the customers continues to remain customers in the next period. As calculated below, both imply a customer lifetime of 4 years:

$$\begin{aligned}\text{Lifetime duration of a customer} &= [1/(1 - \text{retention rate})] \\ &= [1/(1 - 0.75)] \\ &= [1/(0.25)] \\ &= 4 \text{ years}\end{aligned}$$

For a different retention rate of customers, change in customer lifetime duration is calculated and plotted in Figure 4. It is evident from Figure 4 that any increase in retention rate after value of 70% results in steep rise in average customer lifetime (e.g., it increases by 20% with 5% increase in retention rate, i.e., from 70% to 75%). With increase in customer retention rate from 90% to 95%, average customer lifetime increases by 100%, i.e., from 10 years to 20 years. A study by the Gartner group found that profits could be raised 100% by retaining another 5% of customers (Nairn, 2002).

How DCM Initiatives Enhance CLV: An Illustration

Consider a hypothetical illustration of a big multi-location retailer without DCM initiatives. As there was no integration between marketing and SCM functions of the retailer, there was



the major issue of delivering the right product to the right place at the right time. Hence, customers were dissatisfied because of non-availability of desired products in desired quantity. Lack of DCM initiatives resulted in loss of customer satisfaction, trust and loyalty and deterioration of customer relationship. Hence, it translated into low customer retention rate, i.e., 50%. However, after resolving various issues of marketing and SCM integration, the retailer developed a successful DCM and was able to achieve better customer satisfaction, built environment of trust and loyalty and ultimately increased customer repeat purchase and retention rate. Hence, with DCM initiatives by the retailer, the retention rate of customer increased to 70%. The calculation shows the impact of DCM initiatives in terms of high retention and enhanced CLV. As calculated in Table 1, the major cost of customer acquisition for retailer was the cost of customized catalog sent to potential customers.

Calculation

If 'M' and 'c' are relatively fixed across periods, then CLV calculation can be simplified by assuming an infinite economic life (Jain and Singh, 2002), which leads to:

$$CLV = \frac{(M - c)}{(1 + d - r)} - AC$$

where

CLV = Customer lifetime value;

M = The margin of retailer generated by a customer in the year (\$20) (as calculated in row '12' of Table 1);

- c = The cost of promotions targeted to the customer (\$7.80) (as calculated in row '7' of Table 1);
- r = Retention rate (70% or 50% depending on degree of marketing and SCM integration);
- d = Discount rate for calculating Net Present Value (NPV) (10%); and
- AC = Acquisition cost (\$17) (as calculated in row '5' of Table 1).

CLV for both cases, i.e., with DCM initiatives (retention rate 70%) and without DCM initiatives (retention rate 50%), can be calculated with the above equation. The only difference in calculation for both cases is change in the retention rate.

CLV (without DCM initiatives) = \$3.33 and CLV (with DCM initiatives) = \$13.50.

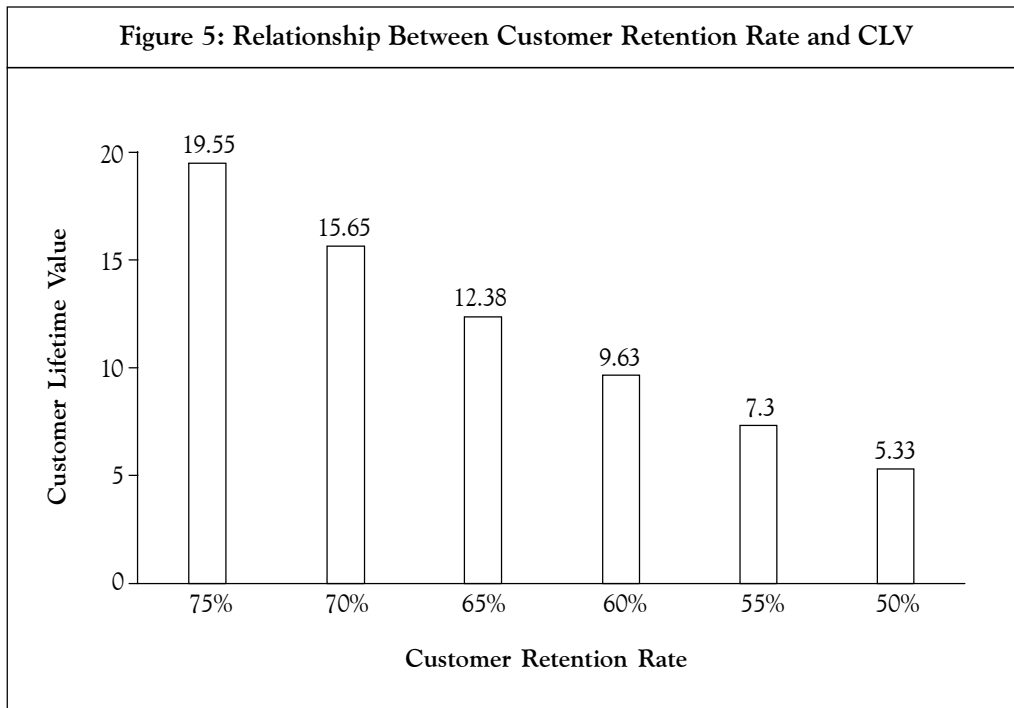
As the above CLV calculation is approximate value with assumption of infinite economic life, a detailed stepwise calculation of CLV for both cases is given in Table 1.

Table 1: DCM Initiatives by Retailer: CLV Calculation									
S. No.	Calculation	Year (n) (n >= 0)							
		0	1	2	3	4	5	6	7
1.	Unit cost of catalog (including mailing cost) (\$)	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
2.	Cost of data per customer, bought from research firm (\$)	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
3.	Unit cost of customized catalog = (1) + (2) (\$)	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
4.	Customized catalog response rate (%)	5	5	5	5	5	5	5	5
5.	Customer acquisition cost = (3) / (4) (\$)	17	17	17	17	17	17	17	17
6.	No. of times catalog sent in a year = (every month)	12	12	12	12	2	12	12	12
7.	Total cost of catalog = (1) x (6) (\$)	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80
8.	Average order size (\$)	50	50	50	50	50	50	50	50
9.	No. of purchase/year	2	2	2	2	2	2	2	2
10.	Gross margin (%)	20	20	20	20	20	20	20	20
11.	Margin on each purchase = (8) x (10) (\$)	10	10	10	10	10	10	10	10
12.	Margin on each customer = (9) x (11) (\$)	20	20	20	20	20	20	20	20
13.	Discount rate (%) (for NPV calculation)	10	10	10	10	10	10	10	10

Table 1 (Cont.)

S. No.	Calculation	Year (n) (n >= 0)							
		0	1	2	3	4	5	6	7
(A) Without DCM Initiatives (Retention Rate = 50%)									
14.	Retention rate (%)	50							
15.	Churn rate = [1 - (14)] (%)	50							
16.	Lifetime duration of a customer = [1/(15)] (years)	2							
17.	Retention rate across years = (14) ⁿ (%)	100	50	25	12.50	6.25	3.13	1.56	0.78
18.	Expected profit/customer = [[(12) - (7)] x (17)] (\$)	12.20	6.10	3.05	1.53	0.76	0.38	0.19	0.10
19.	NPV of profit/customer = [(18) / ((1+(13)) ⁿ)] (\$)	12.20	5.55	2.52	1.15	0.52	0.24	0.11	0.05
20.	CLV = Cumulative profit/customer (net of acquisition cost) (\$)	-4.80	0.75	3.27	4.41	4.93	5.17	5.28	5.33
21.	CLV of new customer (\$)	5.33							
(B) With DCM Initiatives (Retention Rate = 70%)									
22.	Retention rate (%)	70							
23.	Churn rate = [1 - (22)] (%)	30							
24.	Lifetime duration of a customer = [1/(23)] (years)	3.33							
25.	Retention rate across years = (22) ⁿ (%)	100	70	49	34.30	24.01	16.81	11.76	8.24
26.	Expected profit/customer = [[(12) - (7)] x (25)] (\$)	12.20	8.54	5.98	4.18	2.93	2.05	1.44	1
27.	NPV of profit/customer = [(26) / ((1+(13)) ⁿ)] (\$)	12.20	7.76	4.94	3.14	2.00	1.27	0.81	0.52
28.	CLV = Cumulative profit / customer (net of acquisition cost) (\$)	-4.8	2.96	7.90	11.05	13.05	14.32	15.13	15.65
29.	CLV of new customer (\$)	15.65							
30.	Increase in CLV with marketing and SCM integration = (29) - (21) (\$)	10.32							
31.	Increase in CLV with marketing and SCM integration = (30) / (21) x 100 (%)	194							

As calculated in Table 1, DCM initiatives have increased CLV by 194% from \$5.33 to \$15.65. Figure 5 shows the stepwise decrease in customer retention rate because of marketing and SCM integration issues (without DCM initiatives) and its impact on CLV. Notice how small increases in the retention rate have a dramatic effect on CLV.



Discussion

The argument for combining marketing and SCM strengths is compelling. Firms, which effectively link their marketing and supply chain operations, gain competitive advantage by differentiating not only the products and services, but also the underlying delivery processes. They have the capability to satisfy different customer needs with differentiated supply chain capabilities and, therefore, can lower prices on offerings that are of great value to the customer. The major motivation of this research was to address the challenge of interdisciplinary research and the diverse perspectives needed to organize a research agenda. Based upon the theoretical propositions and empirical results of marketing and SCM integration described in the literature review, the conceptual frameworks and integration model of DCM are proposed. If marketing and SCM research is conducted from a standalone perspective, the ability to respond to issues from a holistic view will not be developed. Using an interdisciplinary research agenda, the frontiers of knowledge on marketing and supply chain will be expanded to develop DCM model and the ability to deal with the issues of cross-functional processes will be increased. Marketing and supply chain managers will be helped by this research by being able to both view and resolve supply chain and demand chain issues from a holistic perspective.

Implications and Recommendations: The main objective of this research is to gain a better understanding of the antecedents and consequences of marketing and SCM collaboration to assess and emphasize benefits that may be associated with encouraging such integrative behavior in the form of DCM. The overall goal of marketing of providing superior customer service may be jeopardized by a shortage of cross-functional collaboration. When working relations between marketing and SCM are poor, the coordination and communication that is crucial for enhancing CLV may be lacking. In addition, functional departments may divert considerable attention and effort from serving customers to internal issues like turf protection, and blame game for errors and shortfalls. In contrast, this research suggests that DCM approach can help firms provide superior customer value by developing a mutual understanding of responsibilities, sharing ideas, information and resources, and working together as a team to resolve cross-functional problems of marketing and SCM.

Conclusion

There has been a drastic increase in the pressure on organizations to find new ways to create and deliver value to customers through marketing and SCM initiatives. The goal of DCM is to create unique competitive advantages by linking together customer values with a more effective flow of products. The flow must always be refined and create customer value proposition in a constantly changing market. Marketing and SCM must work together in order to achieve organization goals as firms are increasingly recognizing DCM as a key driver for improving financial and operating performance. The absence of cross-functional collaboration may result in promises made by the firm's sales and marketing department that have not been coordinated with SCM and logistics, marketing promotions that are not synchronized with supply chain delivery schedules, and failure to deliver product by a firm in a specific, requested format because it is not the most efficient way to do so. As suggested in this paper, through a DCM approach, firms could enhance the overall efficiency by interlinking the marketing and SCM operations, and at the same time meet the long-term strategic goals and maximize CLV.

The ideas presented in this paper have the potential to improve marketing and supply chain managers' relational capability and accordingly formulate an effective DCM approach. The concepts of DCM can be used to enhance the cooperative efforts of marketing and supply chain managers. In other words, it has the potential to provide guidance to marketing and supply chain managers who wish to improve their management efficiency. This paper provides various frameworks and models for understanding DCM and its key drivers. The findings of this paper can be further strengthened by performance evaluation of key cross-functional drivers of DCM. This is just a conceptual paper, and further research is required in this area to quantify the benefits of DCM. ❁

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