

Identification and Prioritizing Demand Chain Factors Based on Factor Analysis and TOPSIS

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Abstract. The aim of this study was to represent effective components in demand chain which help organizations attain high performance levels through identification of these components and determining their degree of importance. The following questions were major ideas of this study: what are the most effective components in demand chain? And how are they effective on organizational performance? To this end, marketing components were used in nominal form. Data analysis was conducted via inferential statistics and TOPSIS technique as well as factor analysis. Given to the results, first 39 effective components on demand chain were identified and then it was determined that three components of price, products/services and process are effective in demand chain through factor analysis approach. It showed that demand prediction and diagnosis of consumers' needs and demands, considering population status of customers as well as attracting customer satisfaction, price of products, price of market competitors, seasonal prices and especial discounts, paying attention to the shape and appearance of products, after-sale services, quality and design of products, brand name, complementary products, product diversity, interests and preferences of consumers, innovation, and utilization of modern techniques in packaging can be the factors effective on the performance of demand chain in organizations.

Keywords: Demand chain, supply chain, demand chain management, demand chain optimization, demand chain components.

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1. Introduction

Today successful firms try to attract their customers' satisfaction in target markets. Purchasers are faced with a large number of products and their expectations about quality of products and services are very different in comparison with the past. Given to these facts, purchasers will choose the products and services which have more compatibility with their needs and expectations. The marketing sector in companies is responsible to identify the effective factors on customer satisfaction and increased sales and try to attract satisfaction of their customers.

Demand for products of a firm is the most important determinant of the firm's profitability from various aspects. Despite the efficiency of production processes and managers' skills, a firm cannot act profitably unless there is demand for its products or it can create that demand or produce a new collection of products for which there is demand. Due to the significant role of demand, a firm should have suitable information regarding demand for its productions to be able to make effective decisions in long-term planning and short-term operational decisions (Christopher et al, 2007).

Ever-increasing growth of competitiveness and trying for survival of organizations has been attained through the close relationship between communications and advancement of information technology which are led to attitudes such as supply chain management. In this attitude, a number of suppliers are considered and all members of the chain are directed in an integrated and harmonized manner. Another term based on different needs of customers and a combination of strengths of supply chain and marketing is demand chain management. It is the sales and distribution sector in value chain that size of each sector depends on the place where a special organization exists in the chain; the organization that is closer to the final customer; its demand sector is shorter and the supply sector is longer (Vazirzanjani et al., 2012).

Given to the important role of demand chain in sales and distribution of products and the current business world as well as its close relationship with supply chain management, the major problem of the current study is to propose demand chain components based on supply

chain management approach which is effective on the process of demand and can be influential in supply chain performance of business units and demand chain management.

Thus, purposes of the study can be stated as below: identification and prioritization of demand chain components based on analysis of major components that are effective on demand formation and can have a remarkable effect on organizational performance; helping organizations recognize consumers' needs properly; choosing a suitable strategy regarding how to deal with them and also selecting a strategic relationship with suppliers, maintenance of their competitive status, sales promotion and attaining market share. In the following, literature review and background is first presented and then the methodology and data analysis are mentioned. Conclusions will be stated in the final section.

2. Theoretical Principles and Research Background

Van Goor (2001) performed a study entitled "supply chain and demand chain management: logistical challenges" and besides studying the existing challenges in supply chain management, he proposed a model of demand oriented supply management. According to him, consumers need more different products and services and the industry, too, requires re-supply of small classes with a high return. Consumers need an extensive classification of fresh products, high quality and short time of performing the task or direct delivery. In his findings of the proposed model, he states that increased demand oriented supply management is a combination through which firms can achieve needs of customers more effectively and better than others.

Rajermal et al (2002) performed a study entitled "theory of demand chain management" and studied development of empirical and theoretical approaches and strategic capabilities of demand chain management in the scope of global supply chain. They used two-step approach to achieve reliable data about supply chain and incentives of demand chain as well as some classes of responsive resources in demand chain. They

investigated the existing data of supply chain in the demand chain.

In a study on demand chain management, Chase (2003) intended to mention the importance of this chain and also the strategies for its success. He indicated that demand chain begins with customers and then it is continued through sales agents, distributors, other business partners and those who help selling the products and services of firms. Similarly, he believes that the demand chain is consisted of customers, a network of direct and indirect marketing, selling and offering professional services with the ability to attract, keep, and develop customers and their profitability as well as better, faster and more extensive communications.

Lee (2003), a well-known professor at Stanford University and also head of the EWT Research Center in the US, has focused on technical factors of demand chain optimization and a fixed distribution network was the basis of his hypotheses. He wanted to increase firms' value for each sector or the whole demand chain. Here he mentioned sector, because only one sector can be an optimized for the components in demand chain and there is a special control for each one. In the same vein, he presented key principles for demand chain optimization and stated it as follows: the purpose is optimization of effectiveness on total value of the firm; information transparency in demand chain; comprehensive optimization of full demand chain, and complementary strategies for general utilized strategies.

In a paper entitled "from supply chain to demand chain" Treville et al (2004) studied the role of lead time reduction in improving the demand chain performance. A framework was proposed in this paper to optimize lead time reduction in demand chain improvement project. They suggested using the demand chain and identification of paths to achieve the intended level in terms of performance in the market. The researchers acknowledged that improvement of demand chain performances will be more desirable and effective in various sectors of supply chain if it is accompanied by focusing on lead time reduction. Also they suggested that a desirable performance can be attained by focusing on desirable transfer of demand information in the chain. They proposed a framework for prioritization of lead time reduction in demand chain using demand chain typology and customization of the path to reach

the arbitrary level of market.

In a study entitled "creating insatiable demand-leverage the demand chain" Bingham (2004) asserted that demand chain is the philosophy of business attempts to attract customers and it is mainly focused on development of long-term relations with potential and actual customers through important activities including timely delivery of products and services to customers. Bingham proposed a comprehensive model of demand chain which is a combination of supply chain management, customer relationship management (CRM) and sales force automation (SAF) in which CRM and SAF are especially emphasized. Also, he mentioned five key stages of demand chain: customers as path to revenue; customers as transactions; customers as niches; customer solutions according to segment needs; and full demand chain management.

Christopher et al (2007) performed a study entitled "demand chain management-integrated marketing and supply chain management". They proposed demand chain as the new target business model in value creation in modern markets and presented a model of demand management in which they investigated the relations governing the integrated process, customer relationship management and social interactions. Their conclusion was that demand chain management is a model through which marketing capabilities and supply chain management are resulted in establishment of a customer-oriented supply chain by changing the focus on the customer. Also they believed that more companies adapt their requests with demand chain management to achieve competitive advantages. These companies develop one part of their profit through availability of products, accuracy of transportation, capability, flexible customer relationship, and different initiatives; increase customer strategies and accurate information about customer relationship processes; and match price requirements with structural capability. They argued that demand chain management success is not based on the philosophy of market philosophy; rather on strong marketing and supply chain management competency. Moreover, they asserted that demand chain management follows a reality to explain competitive advantages and show a close relationship between perspectives and strategic management.

Walters (2006) performed a study entitled "demand chain effectiveness-

supply chain efficiencies” and compared supply chain and demand chain. According to him, a number of companies have focused their attempts on developed supply chains; their managers’ focus is limited and they have lost many of their customers and market viewpoints. This fact has been led to losing their loyal customers. Therefore, he investigated the difference between a firm dependent on demand chain and the one dependent on supply chain and suggested factors such as focus, processing, and performance and major factors of each one. He stated that demand chain approach is an extensive viewpoint of management relations; a viewpoint through which relations between the customer and supplier are managed and an effective management completes both of them. If this is obtained, the firm will be closer to purposes. Finally, the obtained results were presented in a comparative form.

In a study entitled ”mining demand chain knowledge of life insurance market for new product development” Liao et al (2009) suggested that demand chain management is a developed viewpoint of operations of business units or companies in a full chain. Also not only it is focused on the power of transfer from the customer towards the merchandise in supply chain, but also investigation of customer satisfaction and his/her participation in purchasing and involvement in orders. Their purpose was to investigate better and more suitable performance as well as needs of customers for life insurance products through presenting special knowledge of models and the consequences obtained from customers and the demand chain.

2.1 Demand chain

The demand chain is the overarching business philosophy that puts the customer at the center and focuses on developing long-term relationships with customers by proactively creating and delivering solutions that profitably meet continually evolving customer needs. Within the demand chain the core focus is on involving customers and prospects in the delivery of products and services that customers want need and are willing to pay for rather than strictly upon what the company has to offer. (Bingham,2004)

Yet many companies believe that customers purchase as a result of effective advertising, fancy products, or even great customer service. In truth, while all of these may influence a customer purchase, none of these explain the primary reason for purchase. Customers purchase products, consume goods, or avail themselves of a service for one reason only: to make a problem go away (Walters, 2006)

In demand chain approach, cooperation between supply chain management and marketing is utilized. It begins with special needs of customers and designs a chain. In order to satisfy such needs, it begins with customers instead of suppliers (Heikkila, 2002). Demand chain approach is an extensive viewpoint of managerial relations which creates relationship management between the customer and supplier. If this viewpoint is fulfilled, organizations will become closer to purposes (Walters, 2006).

2.2 Demand chain important

Revenue and profitability are closely tied to effective demand chain management. Revenues directly correlate with customer satisfaction, as has been scientifically shown by the ACSI/ Michigan customer satisfaction. In a 12-year study of more than 200 companies in 38 industries a direct correlation has been found between consumer satisfaction and revenue growth. Most every product or service can be duplicated, and in some industries even rendered obsolete within as few as six months. Product-based or service-based competitive differentiators are very hard to sustain. (Bingham, 2004)

Between 40-60 percent of all new products fail and it is becoming increasingly costly to introduce new products. Most companies can't afford these risks. The demand chain helps to decrease the uncertainty by ensuring that customers are involved early on to shape the development, delivery, and sales, ensuring success (Christopher et al, 2007)

Customers today are becoming even more demanding than ever before. They increasingly expect individualized attention immediately! In a recent Jupiter survey of online consumer expectations for help-desk response times of financial services companies, for example, it was found that 74 percent of respondents wanted e-mail response from their bro-

kers or other contacts within four hours maximum. The brokers, on the other hand, only promise 24-hour turnaround, sometimes not even delivering within that “long” a timeframe (Liao et al, 2009)

2.3 Demand chain optimization (DCO)

A demand chain is a network of trading partners that extends from manufacturers to end consumers. The partners exchange information, and finished goods flow through the network’s physical infrastructure. The physical facilities include manufacturers’ warehouses, wholesalers’ distribution centers, retail chains’ warehouses and retail outlets. A demand chain can include multiple business enterprises. As product flows through the network, the partners incur costs-but they also enjoy revenue, as product changes ownership between business enterprises. The objective in Demand Chain Optimization (DCO) is to increase enterprise value for any part or all of the demand chain. We say “part,” because one can only optimize those components in the demand chain for which control can be exercised. For example, consider the demand chain that extends from manufacturer to wholesaler to retail chain warehouse to retail store. It’s possible to optimize the demand chain for each trading partner’s portion of it, but total optimization requires a common objective that may or may not exist. (Lee, 2003)

DCO can impact enterprise value in many ways. It can produce:

- Higher customer service levels, which lead to greater revenue and net income.
- Higher inventory turnover, which frees up working capital.
- Higher worker productivity, which lowers operating expenses.
- Higher capacity utilization, which increases the return on assets.
- Lower logistics costs, which decreases operating expenses.
- Lower costs of goods sold, which increases net income.

Making these decisions, and the many others required for effective DCO, requires an understanding of the key principles of DCO and knowledge of the pitfalls that trip up an enterprise as it strives to optimize its demand chain.

2.4 Customer relationship management (CRM) and sales force automation (SFA)

Although the notion of customer relationship management implies enhanced, mutually beneficial relationships with customers (and prospects), the term CRM has been stained by software vendors to the point that CRM universally represents software. Most CRM approaches are still supply- based - they are used nearly exclusively to gather information so companies can sneak up on customers and sell them something. CRM strategies are primarily sales strategies, focusing on pushing existing products using cross-sell and upsell. A valuable, but secondary and often unused focus is that of customer retention. As such, CRM is not normally used to create new products to satisfy customer needs. Sales force automation (SFA) is the precursor to and subset of today's CRM practices, dealing primarily with contact management and the most basic of customer information gathering. . (Bingham, 2004)

2.5 Supply chain management

Throughout the supply chain management craze of the 1980s and 1990s, companies focused nearly exclusively upon increasing operational efficiency primarily through cost containment. During this time, companies have reduced costs by reducing waste, decreasing cycle times, outsourcing, etc. They have become exceptionally efficient in their manufacturing processes - and in some cases, have done so at the expense of their customers. The demand chain focuses on growth potential through long-term customer relationships, revenue and market growth, and profit generation. With a demand chain focus, companies first identify what the "pain" is in the marketplace and then bring to bear all of their supply chain might to solve the market pain at the value-point that customers demand and in the most profitable manner. Unfortunately the supply chain is limited by definition - there are only so many costs you can cut or processes you can optimize to achieve financial growth. (bingam2004)

Supply chain management is a strategic and comprehensive approach for demand, operations and the process of logistics management. Ogulin presented three indexes of supply chain management that are operational

advantage, integrated supply chain and coordination of the potential supply chain. They have been adapted with developmental organizational policies or strategies to respond to four needs: customer focus, technology, communications management and leadership models (Chow et al., 2008).

From the beginning, the purchasing sector that prepared the required goods and services for productions of a firm or organization was established. Such concentrated function in the form of a sector was led to more discipline in the production process of organizations (Rajabzade et al., 2011). Supply chain includes all attempts related to production and delivering the final product from suppliers to customers (Rajabzade et al., 2010).

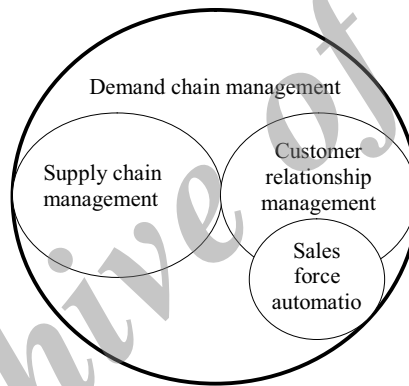


Figure 1. Scope of demand chain management

Thus, the larger picture of the demand chain and its attendant focus on solutions to specific customer pain helps bring focus and clarity to CRM and supply chain functions.

2.6 Demand chain efficiency

Demand chain opposition is an extensive perspective of management relations which creates customer relationship management and the common supplier and an effective management completes both of them. If this is fulfilled, the firm will become closer to its purposes (Walters, 2006).

Lang beer and Rose (2001) take the argument a step further by looking at the demand chain as an entity in its own right suggesting first a simultaneous standardization and differentiation in consumer preferences for products (the demand chain), and second a continued emphasis on cost minimization in manufacturing supply chains. Unfortunately, these two are often at odds with each other. This is an interesting differentiation between the supply chain and the demand chain and between demand management and demand chain management. They define the demand chain as: "The complex web of business processes and activities that help firms understand, manage, and ultimately create consumer demand." They emphasize the point that demand chain management attempts to analyses and understand overall demand for markets within the firm's current and potential product range.

Supply chains, by contrast, emphasize efficiencies in the production and logistics processes, while the demand chain emphasizes effectiveness in the business. A very useful point in their argument is that demand chain analysis and management helps to improve an organization's processes by aligning the organization around a common plan, improves coordination within the supply chain by using forecasts and plans, and exploits the commercial processes by understanding consumer demand and by selecting those markets that best meet an organizations, owned and/or "leased", skills and resources (Langabeer et al, 2001).

This introduces the notion that an effective approach to demand chain management first requires the organization to understand its current and potential markets and second to identify the essential (or core) processes and capabilities that are required for success. They offer a useful summary comparison of the two approaches, shown in Table 1.

Table 1. Supply and demand chain comparison

Supply chain	Demand chain
Efficiency focus; cost per item	Effectiveness focus; customer-focused, product-market fit
Processes are focused on execution	Processes are focused more on planning and delivering value
Cost is the key driver	Cash flow and profitability are the key drivers
Short-term-oriented, within the immediate and controllable future	Long-term-oriented, within the next planning cycles
Typically the domain of tactical manufacturing and logistics personnel	Typically the domain of marketing, sales and strategic operations managers
Focuses on immediate resource and capacity constraints	Focuses on long term capabilities, not short term constraints
Historical focus on operations planning and controls	Historical focus on demand management and supply chain alignment

Source: Langabeer and Rose (2001)

In SCM-focused organizations, procurement is typically an adversarial process. Suppliers are pressured to produce high margins by customers. This is often necessary to hedge against the risk of markdowns should sales forecasts not be met. The DCM-led organization uses market knowledge to develop strong working relationships with suppliers. Given a precise understanding of customer needs (and market trends) it is possible for the procurement process to work with design and development to develop optimal solutions to product and process development options. (Walters, 2006)

Organization favors a cost/volume driven approach. Given a product range, the optimum costs are realized when specific "runs" can be made against sales forecasts

And the finished product sold from inventory. Demand chain-led organizations adopt more flexible structures, typically minimizing downtime by adopting agile manufacturing and QR (quick response) distribution systems. DCM companies often use a build-to-order (BTO) system (and usually not manufacturing unless all or part of the payment has been made), thereby removing the risk of discounted sales to clear inventory. Working closely with both customers and suppliers concurrently can also avoid the risk inherent in the build-for-inventory (BFI) systems. (Liao et al, 2009)

Marketing as a process is also different. The volume bias of the SCM model will often favor price as a primary marketing tool. This is understandable in markets such as fast moving consumer goods (FMCG) where often there is very little scope for differentiation and even where retailer dominance may pressure suppliers for price led promotions. A demand chain-led approach has more flexibility. Usually the decision has been made as to the extent to which price is part of an overall "value package" and this is a result of a comparison of competitor value offers. Value-in-use plays an important role in setting price in this organization because it is usual to consider how these organizations also consider involving partners in their value propositions. (Walters, 2006)

2.7 Selling through the demand chain

The demand chain begins with your customers, and then funnels through any resellers, distributors, and other business partners who help sell your company's products and services. The demand chain includes both direct and indirect sales forces.

Demand chain *n*.

1. Your customers.
2. Your customer's customers.
3. The network

of direct and indirect marketing, sales, and service professionals that provide you with the capability to get, keep, and grow profitable customer relationships better, faster, and bigger.

For example, Compaq currently supports a complex demand chain that accounted for \$48 billion in sales in 2000. About half of those sales were generated through 60,000 sales partners. The company's demand chain extends across 50 nations and is communicated in 17 different languages. This type of complex demand chain requires active management to be successful. (Chase, 2003)

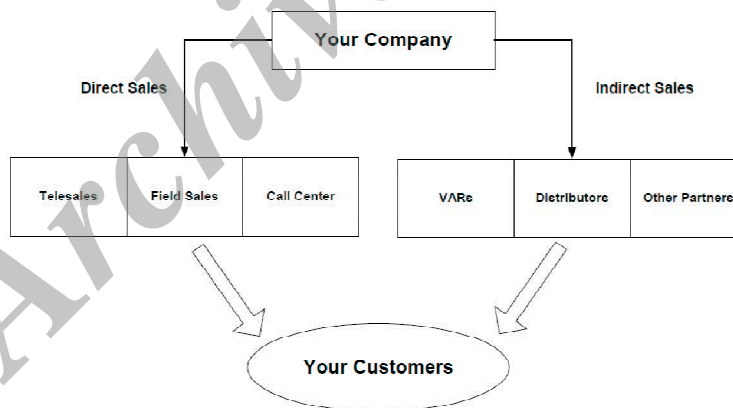


Figure 3. Selling Through the Demand Chain

2.8 The five key stages of demand chain management

The five key stages of demand chain management will be detailed along with characteristics of companies in each stage. Companies at various

stages of demand chain management can be classified along three axes: the product and service drivers, their source of competitive advantage, and how they proactively seek and use customer insight. Using these three axes, companies are categorized into five key stages ranging from customer disdain to full demand chain management. The stages are listed below, along with summaries of company characteristics along each axis. (Bingham, 2004).

Stage 0. Customer disdain

Customers are viewed as unrealistic and demanding people who get in the way of interesting work:

- Product/service drivers: engineering ideas based on “cool” technology.
- Competitive advantage: strictly technology-based.
- Customer insight: little understanding of customers—perhaps even disdain.

Stage 1. Customers as path to revenue

Company is enamored with what they think customers want. “This is how I would use it”. Only customer focus is to forecast revenue:

- Product/service drivers: sales quotas and areas that engineering thinks customers want.
- Competitive advantage: technology-based, perhaps brute sales force.
- Customer insight: used to drive sales forecasts.

Stage 2. Customers as transactions

Customers are viewed as a series of transactions. They are “reactive” to customer complaints, i.e. “I know what customers want” . . .

- Product/service drivers: modification requests, primarily from technical support, and sales quotas.
- Competitive advantage: product and technical support.
- Customer insight: account transactional history.

Stage 3. Customers as niches

Customers are segmented, company can adapt to market conditions, customer focus extends throughout sales, service, marketing and sometimes engineering:

- Product/service drivers: modification requests, services and marketing input.
- Competitive advantage: niche marketing, some operational excellence may emerge in product and service quality, particularly in niche plays.
- Customer insight: customer needs inferred through approximations of need such as demographics, firmographics, etc., customer data captured to increase sales and loyalty. Transactional data gathered in CRM system.

Stage 4. Customer solutions according to segment needs

Companies make focused efforts to understand individual customer needs and use to develop certain products/services. Limited customer experience management via Website:

- Product/service drivers: some product lines are designed with specific customer input, product enhancements are often (but not always) made with customer input, adapting products to customers.
- Competitive advantage: marketing, useful products, support, Website, companies beginning to work backwards from customers and use supply chain management to produce products customers want at profitable prices.
- Customer insight: leveraging advisory boards to gather input for modifications and enhancements and occasionally for new ideas. Some customer input coupled with CRM system to provide minimal view of customers needs

Stage 5. Full demand chain management

- Product/service drivers: customer pain drives all products and services.
- Competitive advantage: The breadth and depth of the insight into customers' needs, prospects wants, and marketplace changes, translated into business strategy.
- Customer insight: gathered at every touch point, made actionable, and disseminated throughout the organization.

2.9 Demand chain components

Given to the intensity of competition in the market, many industries need accurate identification and coordination of demand chain components, and their integrated relationship with supply chain to offer their products and services to customers and the market and enhance their success. Demand chain, identification of its components and their coordination in all related sectors can help organizations achieve their purposes (Vazirzanjani et al., 2002). With regard to the components utilized in the survey, a combination of two models of marketing components proposed by McCarthy and Booms and Bitern (Kotler, 2004) was used. It is explained in the following.

2.9.1. Price

Decisions of pricing should be customer-oriented which means that effective pricing begins with analysis of perceptions about the price and customer needs. Generally speaking, price is what the customer has to pay to receive a product or service. It is one of the major elements of marketing and is the only factor of marketing mix which generates income for the firm. Price has a high sensitivity on consumer's viewpoint so that price of a product is evaluated beside quality of that product and what is expected. Market demand depends on sensitivity of demand value to the price. For some products, a small change in price is led to a big change in demand value. This is while a big change in price of some other products is led to a small change in their demand value (Kotler, 2004).

2.9.2. Product

Historically it has been conceived that a good product will sell itself. Given to the intensive competition among different manufacturers and sellers in the current competitive world, a bad product is meaningless. Moreover, customer support creates more problems for manufacturers of low quality products. Anyway, by "product" in demand components we mean one part of physical and functional characteristics of the product including brand, function, model, quality, safety, packaging, support and guarantee, and accessories. It is obvious that the related decisions

to this component can be modification of the product's problems, increased efficiency and safety, more beautiful designing of the product and improvement of guarantee conditions (Kalschen, 2004).

2.9.3. Distribution

As its names implies, distribution is delivering the product to customers in different parts of the world and distribution systems can be a key factor in success or failure of a product and thus the firm or organization. Coordination of supply chain and also its relationship with demand chain are very important in performance of this component in demand chain. Given that today customers need the best product/service in the best place and time of distribution, integration of this component with other components can play a remarkable role in purposes of the organization. Some points that can be considered in the same component are coordination between distribution and supply, suitable spatial position, distribution integration, support system, availability of products and timely delivery.

2.9.4. Promotion

The term promotion refers to all kinds of personal and impersonal relations of a firm during a special time period. The following can be mentioned among the activities that are done in this component: word of mouth, sales force quality, special privileges and product advertising. Theoreticians of service marketing conducted numerous studies about the difference between service marketing and product marketing. Therefore, they established a new managerial theory and distinguished it from product marketing. This conceptual development brings about re-evaluation of traditional marketing and making a boundary between services and products. Thus products included tangible goods and intangible services (Dalani, 2007).

2.9.5. People

The personnel and people are one of the major and effective elements in service offering. Hiring people and training them to learn how services are offered are very important for obtaining competitive advantage and success in service market, because customers evaluate the quality and

service based on the person who offers it and how he/she interacts. Therefore, people should have an appropriate individual skill and service knowledge in service offering (Briley, 2003).

2.9.6. Process

This component refers to a system that helps the firm offer services to customers. Assume that you receive your hamburger in Berger King only two minutes after you have ordered it or you receive your new credit card in the bank immediately after your request to extend it. Which process has made it possible to offer services with such quality?

2.9.7. Physical conditions

This component is about the place of service offering and customers will judge according to it. Hence, given that one part of customer's perception about service quality is based on the place of service offering and physical conditions, this factor should be considered in service marketing mix and it must be studied carefully.

3. Hypotheses

The model has been considered on the basis of research literature, different components, similar models and results of previous studies. Theoretical framework of the present study is composed of seven hypotheses according to Figure 4.

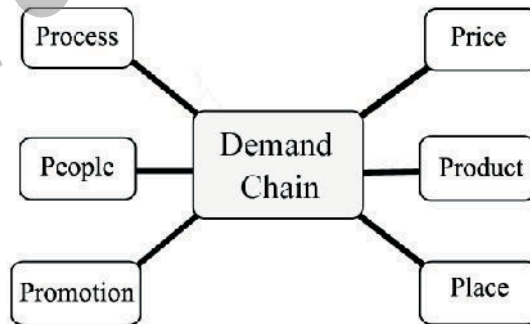


Figure 4. Theoretical framework of the survey

The present survey investigated the following hypotheses:

- 1- Price of products/services in demand chain is effective.
- 2- Products/services in demand chain are effective.
- 3- Distribution of products/services in demand chain is effective.
- 4- Promotional activities in demand chain are effective.
- 5- Manpower in demand chain is effective.
- 6- Process in demand chain is effective.
- 7- The effective components on demand in demand chain can be prioritized

4. Methodology

The statistical population included one-hundred twenty employees of Zamzam Company who were selected through purposeful sampling method among experts of the purchasing, selling and business sector of this company. The sample size was equal to 85 persons based on Morgan Table, the formula to determine the statistical sample and studying standard deviation of the preliminary sample.

This survey was conducted using developmental-descriptive method. Researchers prepared a questionnaire with two sections in order to test the hypotheses and study demand chain components and their effect on demand chain performance. Validity of the questionnaire was confirmed through content validity (experts in this field). The reliability was calculated using Cronbach's alpha coefficient and SPSS software and was obtained equal to 0.7864. Given that Cronbach's alpha more than 70% is acceptable in social sciences studies; reliability of this questionnaire is acceptable.

4.1 Data analysis methods and testing of hypotheses Error

level 5% was used to test the hypotheses. Demand chain components were investigated through factor analysis and correlation. Importance and prioritization of the effective components in demand chain were studied via TOPSIS technique.

4.1.1 Testing questions (hypotheses) based on the results of correlation test

The statistical hypothesis in this test is stated as follows:

Hypothesis 1: Price of products/services in demand chain is effective. As $p < \alpha = 0.05$, there is a significant relationship between the two components. Given to $r = 0.558$, strength of the correlation is moderate. Therefore, H_0 is rejected.

Hypothesis 2: Products/services in demand chain are effective. As $p > \alpha = 0.05$, there is not a significant relationship between the two components. Therefore, H_0 is not rejected.

Hypothesis 3: Distribution of products/services in demand chain is effective. As $p > \alpha = 0.05$, there is not a significant relationship between the two components. Given to $r = 0.101$, H_0 is not rejected.

Hypothesis 4: Promotional activities in demand chain are effective. As $p < \alpha = 0.05$, there is a significant relationship between the two components. Given to $r = 0.414$, H_0 is rejected.

Hypothesis 5: Manpower in demand chain is effective. As $p < \alpha = 0.05$, there is a significant relationship between the two components. Given to $r = 0.377$, H_0 is rejected.

Hypothesis 6: Process in demand chain is effective. As $p < \alpha = 0.05$, there is a significant relationship between the two components. Given to $r = 0.783$, strength of the correlation is high. Therefore, H_0 is rejected.

Hypothesis	Correlation coefficient	Level	Probability
1	0.558	0.000	83
2	0.049	0.663	83
3	0.101	0.363	83
4	0.414	0.000	83
5	0.377	0.000	83
6	0.783	0.000	83

Table 2. Correlation of components of hypotheses

4.1.2 Testing the hypotheses based on factor analysis

The impact of effective components in demand chain is investigated in this step using analysis of primary components. To this end, demand chain components are classified through analysis of the primary components. Results of PCA showed that eigenvalues of three variables among six variables of demand chain are more than one. This is illustrated in the below table.

Table 3. Factor analysis testing of primary components

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Price	1.995	33.242	33.242	1.995	33.242	33.242
Product	1.504	23.059	56.301	1.504	25.059	58.301
Place	.824	10.737	67.038			
Promotion	.706	6.762	73.800			
People	.495	5.251	79.051			
Process	1.477	20.949	100.000	1.477	20.949	100.000

A new classification of variables was proposed through correlation among main variables and the variables obtained from PCA.

Table 4. Classification of main variables using factor analysis

Component	PCA1	PCA2
Price	0.142	0.676
Product	-0.079	0.648
Place	0.085	0.777
Promotion	0.745	0.300
People	0.778	-0.262
Process	0.806	0.119

Considering the correlation among main variables and PCA variables, it can be stated that PCA1 is more affected by three main variables of promotion, people and process and PCA2 variable is more affected by price, product and place. Therefore, price, product and process are effective in the model. They have relation with other components in the model but do not show themselves in the presence of price, product and process. In other words, effects of place, promotional activities and manpower are less than components of price, product and process. Researchers believe that these three factors can be explained given to

the type of space in which customers experience the process of customer relationship, the interaction for a low price and trying to find the best products.

Hypothesis 7: The effective components on demand in demand chain can be prioritized. It was tried in this hypothesis to rank the questions supporting research hypotheses based on their importance in demand chain using TOPSIS technique. The results of this test are shown in Table 5 separately and their prioritization is shown totally in Table 6.

Table 5. Rank of demand chain components based on TOPSIS technique

Price components			Place of distribution components		
Row	Name of component	Rank	Row	Name of component	Rank
1	Competitors' price	0.638	1	Coordination of distribution channel	0.692
2	Price discounts	0.635	2	Coordination of distribution and supply	0.661
3	Special discounts	0.587	3	Suitable spatial status	0.619
4	List of prices	0.551	4	Distribution integration	0.61
5	Seasonal prices	0.448	5	Logistics system	0.6
Product components			6	Accessibility of products	0.546
Row	Name of component	Rank	7	Timely delivery	0.507
1	Shape and appearance of products	0.763	Promotion components		
2	After-sale services	0.739	Row	Name of component	Rank
3	Quality of products	0.718	1	Word of mouth	0.712
4	Design of products	0.705	2	Sales force quality	0.686
5	Brand name	0.701	3	Special privileges	0.629
6	Diversity of products	0.701	4	Competitors' advertisements	0.575
7	Complementary products	0.628	5	Choosing of medium	0.529
8	Interest and preferences of consumers	0.58	6	Product advertising	0.514
9	Innovation	0.557	Process components		
10	Packaging	0.553	Row	Name of component	Rank
11	Guarantee	0.534	1	Demand prediction	0.582
12	Substitute products	0.409	2	Diagnosis of needs and demands	0.582
Manpower components			3	Population status of customers	0.565
Row	Name of component	Rank	4	Attracting customer satisfaction	0.517
1	Receiving complaints by manpower	0.663			
2	Timely receiving of orders	0.593			
3	Integrated relation of manpower	0.573			
4	Manpower training	0.567			
5	Service offering by experts	0.48			

Prioritization of components using TOPSIS technique

TOPSIS model is one of the multiple attribute decision making (MADM) methods in which components are prioritized. The steps include formation of decision table, data normalization, and formation of weighted average matrix, determining the positive and negative optimums, and determining the executable ranking index (Azar & Rajabzadeh, 2013). Full prioritization of demand chain components was

conducted through TOPSIS technique that is one of the techniques of MADM models. They are displayed in Table 6.

Table 6. Prioritization of demand chain components in terms of importance based on TOPSIS technique

Row	Component	Row	Component
1	Word of mouth	21	Design of products
2	Receiving complaints by manpower	22	List of prices
3	Sales force quality	23	Choosing the medium
4	Shape and appearance of products	24	Logistics system
5	After-sale services	25	Attracting customer satisfaction
6	Special privileges	26	Distribution integration
7	Price discounts	27	Suitable spatial status
8	Coordination of distribution channel	28	Product advertising
9	Competitors' price	29	Population status of customers
10	Quality of products	30	Complementary products
11	Diagnosis of consumer's needs	31	Service offering by experts
12	Competitors' advertisements	32	Seasonal prices
13	Brand name	33	Accessibility of products
14	Manpower training	34	Timely delivery
15	Diversity of products	35	Interest and preferences of consumers
16	Special discounts	36	Packaging
17	Integrated relation of manpower	37	Innovation
18	Coordination of distribution and supply	38	Guarantee
19	Demand prediction	39	Substitute products
20	Receiving the orders on time		

5. Conclusion and Recommendations

Having analyzed the first hypothesis, the results revealed that there is a significant relationship between price and demand chain given to the moderate correlation. As a result, it can be argued that price of products/services in demand chain is effective on cycle of this chain, because it has a very sensitive role. Price of a product is often evaluated beside quality of that product and what is expected. Market demand depends on demand sensitivity towards price. Therefore, managers should consider the pricing strategies in a specific manner to achieve their purposes and improve the performance of their firm, coordinate supply chain and demand chain, increase sales and obtain high market share.

Results of analyzing the second hypotheses revealed that there is not a significant relationship among products/services and demand chain given to lack of correlation. The important point is that most companies want to create demand for their manufactured product or service and this is fulfilled through considering the demand chain. Thus, products/services cannot be regarded among the effective components on demand as well as demand chain, since the firms want to increase demand for their products/services by having other demand chain components. Firms in demand chain try to make a desirable relationship with customers, introduce their products/services, attract customers towards their products in the current competitive world and enhance their market share through customer relationship management and sales force automation.

Results of hypothesis three indicated that there is no significant relationship between distribution and demand chain given to lack of correlation. Considering that products/services are distributed in various places and distribution systems can be a key factor in success or failure of the product and thus the firm, it can be argued that distribution can only be regarded among the primary components of demand chain when it can fulfill its primary purpose, i.e. accessibility of the product for potential customers at a suitable time and place in coordination with supply chain. Having analyzed hypothesis four, the results revealed that there is a significant relationship between promotional activities and demand chain given to the moderate correlation. Therefore, given to high effect of promotional activities on demand chain and creating demand for products/services, it can be regarded among the components of this chain. Firms try to create demand for their products using different types of personal and impersonal relations. Through this component, they can implement one part of their purposes. Word of mouth is one of the activities existing in this component and its rank was equal to 0.712 based on prioritization of secondary components via TOPSIS technique. This was the highest rank in comparison with other components that showed it is highly important. This component is used today in various methods, for instance, in Zara stores across the world.

Results of hypothesis five showed that there is a significant rela-

tionship between manpower and demand chain given to the moderate correlation. Considering that manpower is one of the major and effective elements on offering products and services which is a bridge between productions and consumers, thus, manpower is one of the components of demand chain. Firms should focus much on this component in order to have access to an effective and helpful demand chain to be able to employ efficient and experienced employees and fulfill their organizational purposes.

Results of hypothesis six indicated that there is a significant relationship between process that includes demand prediction, diagnosis of needs and demands, population status of customers, attracting consumer satisfaction and demand chain given to the high correlation. This component can have a significant role in performance of a full demand chain.

The most effective primary components in demand chain were proposed via factor analysis. Price, products/services and process have a considerable effect in demand chain cycle that shows factors such as demand prediction, diagnosis of consumers' needs and demands, considering population status of customers as well as attracting their satisfaction, price of products and that of market competitors, offering seasonal prices and special discounts, paying attention to shape and appearance of products, after-sale services, quality and design of products, brand name, complementary products, product diversification, interest and preferences of consumers, innovation in products, and modern techniques in packaging are effective on performance of demand chain. Given that price, products/services and process are the most effective components in demand chain, it is essential for experts to be careful in implementation of these components. Having investigated the secondary components and prioritized them, it can be stated that given to the importance of word of mouth by manpower which shows manpower is very important and is the bridge between manufacturers, firms and consumers, thus experts should be able to implement it considering the type of productions. Generally, according to the obtained results, firms and companies should have the highest focus on price, products/services, promotion, manpower and process to improve their demand chain, market penetration and achieve high market share. In this way they will be

able to increase their market share in competitive markets.

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