Enhancing Customer Delight in LED Televisions by Using the KANO Model

** K. Saranya*
*** P. Santhi*

Abstract

Customer requirement management has become one of the principal factors for product development to succeed in the market place. Product is the most important element in the marketing mix. It provides the functional requirements sought by customers. The television market in India is graduating from the cathode ray (CRT) television to LED (light emitting diode) television. The technology applied television creates new needs even as they serve others. The Kano model is a better tool for determination of customer requirements for new product development and innovation. The Kano model has been applied for multiple new product design and innovation for compliance with customer needs with respect to customer satisfaction. The objective of the present study was to measure product requirements from customers' perspectives for product development and thereby to achieve a competitive advantage in the LED television market. The study was based on primary data collected from 150 sample respondents (drawn by using the random sampling method) who were the users of LED television, irrespective of the brand of television. The positive customer satisfaction coefficient on the feature : clear motion rate brought more than proportional satisfaction. The quality improvement index brought out the key product features that could be incorporated in designing LED television to gain a competitive advantage in the LED television market.

Keywords: **product development, customer satisfaction, customer requirements, quality improvement, Kano model**

Paper Submission Date : February 5, 2015 ; Paper sent back for Revision : July 1, 2015 ; Paper Acceptance Date : October 24, 2015

A customer-oriented company expects and wants its customers to compare its offerings against those of competition and uses customer feedback to improve its operations. It delves deep into customer's circumstances to unearth their choice criteria and ensures that its offerings meet the customer's choice criteria better than the offerings of its competitors. Customer requirement management thus becomes one of the principal factors for product development to succeed in the market place (McKay, dePennington, & Baxter, 2001). Product is the most important element in the marketing mix. It provides the functional requirements sought by customers. Customers primarily get interested in dealing with a company because they feel that its products are capable of serving their needs. A number of complex customer behaviour such as perception, motivation, attitude, and personality can be grouped under psychological factors for making rational decisions (Lancasters & Massigham, 1994). A product is anything which is capable of satisfying customers' needs. Satisfaction is defined as the process of customers' understanding and assessment of experiencing product consumption or use of other services (Shahin, 2003). Customer satisfaction is enhanced if value added after sales or post purchase service is given in a committed manner (Kar & Bhoi, 2014).

* *Assistant Professor,* Department of Commerce, Rathinam College of Arts and Science, Eachanari, Coimbatore-641021, Tamil Nadu. Email: Thomassaran1@gmail.com

** *Associate Professor,* Department of Commerce, Avinashilingam Institute for Home Science and Higher Education for Women, Bharathi Park Road, Coimbatore-641 043, Tamil Nadu. Email: psanthi66@gmail.com

Technology Product : LED Televisions

Customers find it difficult to compare such products on objective criteria and the decision to buy one particular brand is very personal and is based on individual assessment of the merits of a brand. The merits of a product provide a basis for deciding to purchase one brand or another. Different members of the buying group may use different choice criteria. There are several inherent paradoxes in technology products that may prevent or postpone customer adoptions. Apart from offering market focused products which correspond to an average satisfaction of customer requirements, companies are pursuing a strategy of offering customer focused products with a large degree of individuality (Tseng & Piller,2003).

Companies must diligently address these issues to make customers feel more comfortable. Products are embedded with increasing amount of technology. Many technology products create new needs even as they serve others. The television market in India in graduating from the cathode ray (CRT) television to LED (light emitting diode) television. Sony, Samsung, LG, and Panasonic are the leading market players who have brought innovation in the television market with three dimensional excellence, dizzying picture quality, convenience, and connectivity. Even though there are several inherent paradoxes in a technology product that may present or postpone customer adoptions, the LED television manufacturers addressed these issues successfully to make customers feel more comfortable.

Literature Review

Customer satisfaction is the ultimate objective of every business: not to supply, not to sell, not to service, but to satisfy the needs that drive customers to do business (Hanan & Karp, 1989). Customer satisfaction reduces price elasticity. New product development plays several roles for the organization. It helps to maintain growth and thereby protect the interest of investors, employees, and suppliers of the organization. New product development helps to keep a firm competitive in a changing market (Patrick, 1997). If product flaws or customer complaints are reduced, customer satisfaction increases, and if new functions are added to products or novel designs are developed, customer satisfaction will be increased (Kano, Seraku, Takahashi, & Tsuji, 1984). From a strategic point of view, new products well attuned to the voice of the customer, with perceived technical superiority, developed within budget, and launched ahead of competition provide real competitive advantages (Nikolaos, Hultink, & Susan, 2004).

Product development is an integrated result of design, manufacturing, research and development, and compliance with the voice of customers. To identify the customers' needs, the team developing the product must first determine exactly who the customers are. In most design situations, there is more than one customer (Drechsler, Natter, & Leeflang, 2013). Customer needs with producer capacity assessment is essential for product development. The voice of the customer and relevant information can be obtained to improve the customer satisfaction according to market segmentation (Garibay, Gutierrez, & Figueroa, 2010). The consumer co - creation at different stages of new product development process namely, ideation, product development, commercialization, and post launch is significant for success in the market (Hoyer, Chandy, Dorotic, Krafft, & Singh, 2010). One of the major reasons behind the low success rate is that organizations do not understand end users (Fain, Kline, & Duhovnik, 2011). New product development speed is associated with improving success outcomes (Antony, 2013). The important attributes of a brand of product such as quality and prices have received attention. Product attributes like durability and customer service have also been appreciated (Juyal, 2013).

Statement of the Problem

Customer needs are changing due to technology and due to customers' age, income, profession, and education. The

assessment of customer needs is a continuous process. In case of new product development and innovation, what is considered now are customer satisfaction, affordability, production rate, technical ability, value chain, and competition for successful launch and sustainment of the product in the market (Browing, Fricke, & Negele, 2006). New product development is a complex engineering task in which a great deal of human-physical resources, methods, and tools are involved for greater customer satisfaction (Fujita & Matsuo, 2006). The product development team of quality function deployment could consider the customer requirements as an arbitrary basis in the first of quality function deployment (Hari, Kasser, & Weiss, 2007 ; Kobayashi, 2006 ; Poel, 2007). For removing this arbitrary value of customer requirements, a fuzzy quality function deployment approach could be used to find appropriate customer requirements from customer feedback (Bottani & Rizzi, 2006). In this perspective, the Kano model is also a better tool for determination of customer requirements for new product development and innovation. The Kano model has been applied for multiple new product design and innovation for compliance with customer needs with respect to customer satisfaction (Hashim & Dawal, 2009).

Kano Model of Customer Satisfaction

The Kano model (Kano et al.,1984) distinguishes three types of product requirements which influence customer satisfaction in different ways when met (Figure 1). This model is used to establish the importance of individual product features for the customers' satisfaction and thus, it creates the optimal prerequisite for process oriented product development activities. The horizontal axis of the Kano model includes the performance manner of some fields of products and services. The vertical axis shows how customers become satisfied with receiving products and services (Kondo, 2001). The basic needs curve of the Kano model shows that if customers expect more satisfaction with receiving satisfaction products and services, it cannot satisfy customers. The excitement needs curve shows that whenever the product has a higher performance, customers receive more customer satisfaction, but lower performance will not cause customers' dissatisfaction. The performance requirement curve indicates the fact that non-fulfillment of performance requirements of products will cause dissatisfaction. In other words, how does identification and consideration of such a suitable fulfillment will be followed by customers' satisfaction (Kelsey & Bond, 2001).

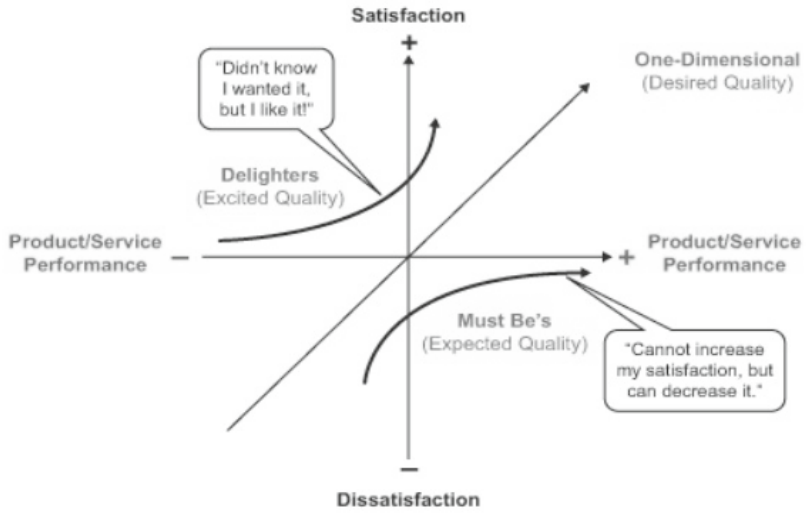
Objective of the Study

The major objective of the present study is to measure product requirements from customers' perspectives for product development and thereby achieve competitive advantage in the LED television market.

Research Methodology

The present study is based on primary data collected from the users of LED television (irrespective of the brand of television) from 150 sample respondents covering the time period from January - February 2015. The respondents were drawn by using the random sampling method from the list of customers residing in Coimbatore city. The list was obtained from a durable goods showroom selling LED televisions. Customer interviews were useful for identifying visible product requirements and customer problems ; attractive requirements were not expressed by the customers as these are the features which they did not expect in the products. Focus group interviews were conducted with product dealers, and from customers who owned and used such television sets with advanced features in foreign countries which are new to the Indian market. The questionnaire was constructed in order to elicit customer requirements based on the Kano model along with self-stated importance of individual product criteria from respondents' point of view. The data reliability of 0.92 was established through Cronbach's alpha reliability test.

Figure 1. Kano's Model of Customer Satisfaction



Results and Discussion

(1) Distribution of the Respondents Based on Socioeconomic Status : The consumer profile reveals the demographic details of the consumer. The consumers seen from a socioeconomic angle have a great bearing on the marketers to plan strategies towards making the market mix matching their needs and requirements. Customers are interested in the purchase of goods and services so as to satisfy their personal, socioeconomic, and environmental needs. Among the LED television owners who constituted the sample, majority of the respondents (79.40 %) belonged to the age group between 20 and 40 years, and the remaining 20.7% of the respondents were above 40 years of age. Out of the total respondents, men constituted 56% of the respondents and women respondents constituted 44% of the total sample. Majority of the respondents (83.30%) were married and 16.70% were unmarried. Majority of the respondents (64.70%) lived in nuclear families, and 35.30% of the respondents lived in joint families.

Education is a parameter used for measuring a person's worth or value and status in the society. With respect to the educational qualifications, 32% of the respondents were graduates, 20.70% were post graduates, 18% had skill education, 16.70% of the respondents had education up to the higher secondary level, and the remaining 12.70% of the respondents were professionals.

Occupation is referred to be symbolic to a person's consumption behaviour and the role and status accorded to them by the society. As far as the occupation of the respondents is concerned, 60% of the respondents were engaged in full time employment, 26.70% of the respondents were engaged in business, and 13.30% of the respondents were homemakers. With reference to the occupation of the spouses, 57.3% were engaged in employment, 16% were engaged in business, and 10% were homemakers. With regard to monthly income of the respondents, only 3.30% of the respondents had a monthly income above ₹ 1,00,000 ; 38.70% of the respondents earned a monthly income between ₹ 40,000 and ₹ 60,000 ; 30.70% of the respondents earned a monthly income between ₹ 20,000 and ₹ 40,000 ; 9.30% of the respondents had a monthly income between ₹ 60,000 and ₹ 80,000, and 4.70% of the respondents earned between ₹ 80,000 and ₹ 1,00,000.

The spouses were also contributing to household income as 32.70% of the respondents earned between ₹ 40,000 per month and ₹ 60,000 per month ; 22.7% of the respondents earned a monthly income between ₹ 20,000 and ₹ 40,000 ; 8.7% earned a monthly income between ₹ 60,000 and ₹ 80,000 ; 5.30% earned a monthly

income between ₹ 80,000 and ₹ 1,00,000, and 4.70% earned a monthly income above ₹ 1,00,000. Depending on the product category, the individual family members also played a dominant role in the purchase decision.

The family size prevailing for a majority of the respondents (61.30%) was up to four members, 20% of the respondents had four to six members in their family, and the remaining 18.7% of the respondents had above six members in their family. As observed by Juyal (2013), the demographic profile of the consumers has a significant bearing on the consumers' purchase behaviour of durable goods.

(2) Evaluation of Product Requirements in LED Televisions from the Respondents' Perspective : The product criteria which have great influence on the customers' satisfaction with products are classified into must-be (M), one-dimensional (O), attractive (A), indifferent (I), and reverse (R) dimensions that can be used to form the basis for product development.

The *must-be requirements* in a product are the basic requirements. The features are self-evident, implied, and not mentioned. These requirements improve customer expectations. Must-be requirements are in any case a decisive competitive factor, and if they are not fulfilled, the customer will not be interested in the product at all. *One-dimensional requirements* are performance based. These requirements are technical in nature. These could be stated, specified, and measurable. One-dimensional requirements are usually explicitly demanded by the customer. The better it is, the more satisfied a customer is and vice versa. *Attractive requirements* are not explicitly expressed, customer tailored, transcendent, and are surprises in a product which enhance customer delight. Indifferent requirements do not make much difference in satisfaction. An overview of the requirements category of the individual product is presented in the Table 1.

The Table 1 shows the frequencies of responses obtained from the selected sample respondents with regard to LED televisions. According to the responses, must-be requirements in an LED television are picture quality (44.67%), amazing view (44%), web browser (36.67%), contrast and clarity (41.33%), power saver (50%), digital sound (40%), easy search (42%), wi-fi built-in (39.33%), wireless keyboard compatible (28.67%), dual core processor (39.33%), and slim LED design (43.35%). If these requirements are not fulfilled in an LED television, the customer will be extremely dissatisfied and will not be interested in the product at all. These are the basic criteria of LED televisions as reported by the respondents. Fulfilling these must - be requirements will only lead to a state of "not being dissatisfied".

The one-dimensional requirements in an LED television from the respondents' point of view are : rotate viewing angle (41.33%), clear motion rate (44%), connect share movie (34%), 3D Blu ray player (28%), and Skype compatible (34%). These are one-dimensional requirements in an LED television that are explicitly demanded by the customer. The customer satisfaction in these requirements is proportional to the level of fulfillment. Higher the level of fulfillment, the higher is the satisfaction.

The attractive requirements are the product criteria which are neither explicitly expressed nor expected by the customer. Fulfilling these criteria leads to more than proportional satisfaction, even if they are not met; there is no feeling of dissatisfaction. With regard to LED televisions, the attractive requirements (as mentioned by the respondents) are : 3D conversion (37.33%), photos and videos (43.33%), digital natural sound engine (36%), apps for TV (43.33%), smart hub (44%), and smart touch remote (38.67%). The indifferent requirements are neither good nor bad. The customers have no strong feeling on the matter. Micro dimming (43.33%) in LED televisions was considered as an indifferent requirement by the respondents.

The reserve requirements are the dissatisfiers ; these are the undesired features that will actually decrease satisfaction and delight when included. With regard to LED televisions, the reserve requirement is : all share play (33.33%), which was considered as an undesired feature by the respondents.

The evaluation rule M > O > A > I is very useful if the individual product requirements cannot be ambiguously assigned to various categories. First of all, as can be inferred from the analysis, the 11 must-be requirements have to be fulfilled, which cause dissatisfaction if not met. When deciding which of the eight attractive requirements should be satisfied, the deciding factors are how important they are for the customer. This can be determined by

Table 1. Product Requirement Category from Respondents' Perspective

Product requirements	A	O	M	I	R	Total	Category
Picture quality	9.33	27.3	**46.67**	12.1	4.6	100%	M
Amazing view	29	18	**44**	5.33	3.67	100%	M
3D conversion	**37.33**	22.66	30	4.66	5.35	100%	A
Web browser	30	8	**36.67**	20.0	5.33	100%	M
Contrast clarity	14.66	36.66	**41.33**	3.3	4.05	100%	M
Rotate viewing angle	12	**41.33**	38.66	4.66	3.35	100%	O
Power saver	16	14	**50**	13.33	6.67	100%	M
Digital sound	22	31.33	**40**	2.0	4.67	100%	M
Easy search	24.66	22	**42**	4.66	6.68	100%	M
Photos &videos	**43.33**	7.33	21.33	14.66	13.35	100%	A
Clear motion rate	36.66	**44**	14.66	2	2.68	100%	O
Wide colour enhancer plus	**37.33**	24.66	18	5.33	14.68	100%	A
Micro dimming	26.66	8	15.33	**43.33**	6.68	100%	I
Digital natural sound engine	**36**	7.33	10	26.66	20.01	100%	A
Connect share movie	20	**34**	21.33	10	14.67	100%	O
Apps for TV	**43.33**	10.66	29.33	3.3	13.38	100%	A
All share play	11.33	18	32.66	5.33	**32.68**	100%	R
Wi-Fi built-in	10	33.33	**39.33**	13.33	4.01	100%	M
Smart hub	**27.33**	22	24.66	26	1	100%	A
Smart interaction	**44**	16	18.66	10	11.34	100%	A
Smart touch remote	**38.67**	12.66	20	13.33	15.34	100%	A
3Dblu -ray player	26	**28**	20	3.3	22.7	100%	O
Wireless keyboard compatible	26.66	18.66	**28.67**	6	20.01	100%	M
Dual core processor	26	18	**39.33**	3.3	13.37	100%	M
Slim LED design	19.33	30.66	**43.33**	2	4.68	100%	M
Skype compatible	27.33	**34**	6	2.01	30.66	100%	O

using the "self-stated importance" expressed by the respondents (the two or three requirements which are regarded as the most important ones as per customer segments). The five one-dimensional requirements listed in the previous paragraphs were demanded by the customers. The level of customer satisfaction varies with the level of fulfilment of these requirements. It can also be inferred that customers in different segments have different product expectations. The above results can be used as the ideal basis for market segmentation. Thus, differential products and service offerings are possible according to the utility expectation of different customer segments.

(3) Customer Satisfaction Coefficient (CS Coefficient) : The customer satisfaction coefficient states whether satisfaction can be increased by meeting a product requirement, or whether fulfilling these product requirements merely prevents the customer from being dissatisfied (Kurt & Hinterhuber, 1998). Different market segments usually have different needs and expectations, so sometimes, it is not clear whether a certain product feature can be assigned to various categories. It is especially important to know the average impact of product requirements on the satisfaction of all customers. The CS-Coefficient is indicative of how strongly a product feature may influence

satisfaction or, in case of its "non-fulfilment," customer dissatisfaction. To calculate the average impact on satisfaction, it is necessary to add the attractive and one-dimensional columns and divide by the total number of attractive, one-dimensional, must-be, and indifferent responses. For the calculation of the average impact on dissatisfaction, add the must-be and one-dimensional columns and divide by the same normalizing factor (Witell & Lofgren, 2007).

Extent of Satisfaction: A+O/ (A+O+M+I)
Extent of Dissatisfaction: O+M/ (A+O+M+I) - 1

A minus sign is put in front of the CS-coefficient of customer dissatisfaction in order to emphasize its negative influence on customer satisfaction if this product quality is not fulfilled. The positive CS- coefficient ranges from '0' to '1'; the closer the value is to 1, the higher is the influence on customer satisfaction. A positive CS-coefficient which approaches 0 signifies that there is very little influence. At the same time, however, one must also take the negative CS-coefficient into consideration. If it approaches -1, the influence on customer dissatisfaction is especially strong if the analyzed product feature is not fulfilled. A value of about '0' signifies that this feature does not cause dissatisfaction if it is not met.

It can be inferred from the Table 2 that negative customer satisfaction for rotate viewing angle (-0.79) and contrast & clarity (-0.77) leads to more than proportional dissatisfaction. A good rotate viewing angle (0.53) and contrast and clarity (0.51) with positive customer satisfaction coefficient can only slightly increase satisfaction. Similarly, slim LED design with negative customer satisfaction coefficient (-0.73) and wi-fi built-in with negative coefficient (-0.72) would lead to more than proportional dissatisfaction. A good slim LED television (0.49) and wi-fi built-in (0.43) with positive customer satisfaction coefficient can slightly increase satisfaction. The positive customer satisfaction coefficient of 0.80 for clear motion rate brings more than proportional satisfaction. The features which having very little influence on customer satisfaction are : all share play (0.29), power saver (0.3), micro dimming (0.34), and picture quality (0.36). The classification of product requirements in LED television based on frequency shows that out of the 11 features of the must-be requirements, eight are attractive requirements, five features are one-dimensional requirements, and only one item is an indifferent requirement. This fulfils the expectation rule, establishing the expectation of the customers.

(4) Quality Improvement Index : The quality of one's own products perceived in comparison to that of the strongest competitors is of prime importance for product development strategies and improvement measures. Thus, it is useful not only to have the customers evaluate one's own products but also to get customers' opinion of the competitors' products. Customer needs are changing because of their economic status and their view about themselves. Companies should be ready to encounter a competitive environment, which would be very different from the ones that they have been experiencing. Marketers on understanding their strength of existing competitive advantage and disadvantage prevailing with respect to their products in relation to customer satisfaction could improve their market performance and sustain in the market. The LED television manufacturers in their product development need to concentrate on and improve certain features which are already existing and latent to their products to gain a competitive advantage. Accordingly, a quality improvement index was computed for the product feature expectation on product development of LED televisions.

The quality improvement index (QI) is the ratio calculated by multiplying the relative importance of a product requirement for the customer by the gap value of the perceived product quality (own product versus competitor's product) gained from the rating scale in the questionnaire (Griffin & Hauser, 1993).

Quality Improvement Index = Relative Importance x (Evaluation of Own Product x Evaluation of Future Product).

Table 2. Customer Satisfaction Coefficient of LED Televisions

Product requirements	A	O	M	I	R	Total	Category	A+O/ A+O+M+I	O+M/ A+O+M+Ix(-1)
Picture quality	9.33	27.3	46.67	12.1	4.6	100%	M	0.36	-0.73
Amazing view	29	18	44	5.33	3.67	100%	M	047	-0.62
3D conversion	37.33	22.66	30	4.66	5.35	100%	A	0.59	-0.52
Web browser	30	8	36.67	20	5.33	100%	M	0.38	-0.44
Contrast clarity	14.66	36.66	41.33	3.3	4.05	100%	M	0.51	-0.77
Rotate viewing angle	12	41.33	38.66	4.66	3.35	100%	O	0.53	-0.79
Power saver	16	14	50	13.33	6.67	100%	M	0.3	-0.64
Digital sound	22	31.33	40	2	4.67	100%	M	0.53	-0.71
Easy search	24.66	22	42	4.66	6.68	100%	M	0.46	-0.64
Photos &videos	43.33	7.33	21.33	14.66	13.35	100%	A	0.50	-0.28
Clear motion rate	36.66	44	14.66	2	2.68	100%	O	0.80	-0.58
Wide colour enhancer plus	37.33	24.66	18	5.33	14.68	100%	A	0.62	-0.42
Micro dimming	26.66	8	15.33	43.33	6.68	100%	I	0.34	-0.23
Digital natural sound engine	36	7.33	10	26.66	20.01	100%	A	0.43	-0.17
Connect share movie	20	34	21.33	10	14.67	100%	O	0.54	-0.55
Apps for TV	43.33	10.66	29.33	3.3	13.38	100%	A	0.53	-0.39
All share play	11.33	18	32.66	5.33	32.68	100%	R	0.29	-0.50
Wi-Fi built-in	10	33.33	39.33	13.33	4.01	100%	M	0.43	-0.72
Smart hub	27.33	22	24.66	26	1	100%	A	0.49	-0.46
Smart interaction	44	16	18.66	10	11.34	100%	A	0.6	-0.34
Smart touch remote	38.67	12.66	20	13.33	15.34	100%	A	0.51	-0.32
3Dblu -ray player	26	28	20	3.3	22.7	100%	O	0.54	-0.48
Wireless keyboard compatible	26.66	18.66	28.67	6	20.01	100%	M	0.45	-0.47
Dual core processor	26	18	39.33	3.3	13.37	100%	M	0.44	-0.57
Slim LED design	19.33	30.66	43.33	2	4.68	100%	M	0.49	-0.73
Skype compatible	27.33	34	6	2.01	30.66	100%	O	0.61	-0.4

The extreme values of the quality improvement index depend on the number of points in the rating scale. In this study, it ranges from -42 to +42. The value is indicative of how important the product requirement is in terms of competition. The higher the value in the positive range, the higher is the relative competitive advantage in the perceived product quality from the customer's viewpoint. However, the higher the negative value of this index, the higher the relative competitive disadvantage. Therefore, it is far more important to improve this product requirement. The Table 3 and Figure 2 depict the computations of the quality improvement index.

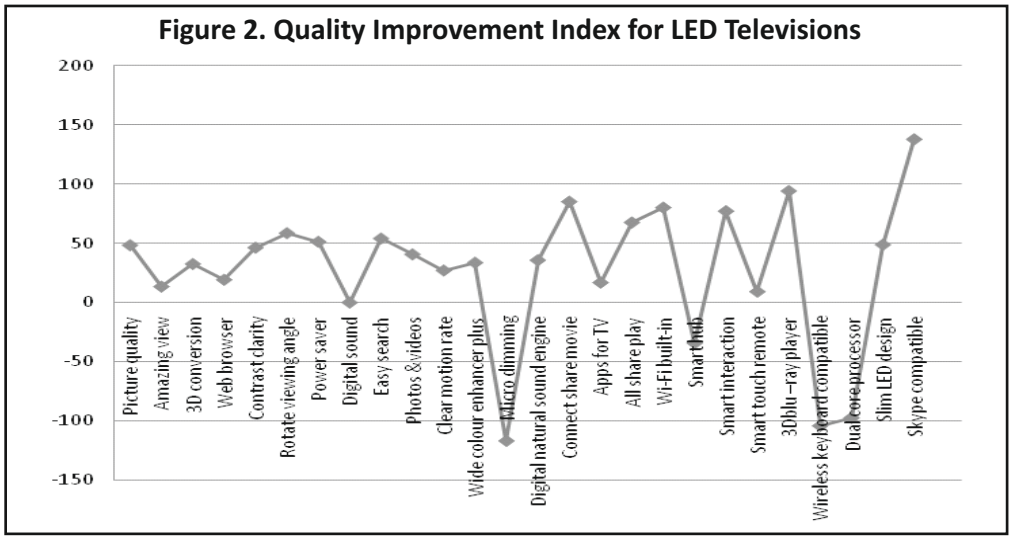
The quality improvement index brings out the product features that can be considered as features to gain a competitive advantage in the LED television market namely, Skype compatible (137.6), built in wi-fi (80), 3D Blu ray player (194), smart touch remote (92), and connect share movie (85) along with other features. These features, if not present, need to be incorporated well in an LED television or for the present quality to be enhanced, or to form the basis for competitive advantage to win over competition. The above analysis has brought out some of the product features which are considered as competitive disadvantage namely, micro dimming (-116.6), wireless keyboard compatibility (-104), and dual core processor (-97.2). In order to gain an advantageous position in the market through customer satisfaction, these feature are to be incorporated and improved.

Table 3. Quality Improvement Index of LED Televisions

Features	Relative Importance (%)	Gap value	Quality index
Picture quality	69	6.3-7.0=-0.7	48.3
Amazing view	67	6.3-6.5=-0.2	13.4
3D conversion	65	5.8-6.3=-0.5	32.5
Web browser	64	6.2-6.5=-0.3	19.2
Contrast clarity	66	6.0-6.7=-0.7	46.2
Rotate viewing angle	65	6.1-7.0=-0.9	58.5
Power saver	64	6.0-6.8=-0.8	51.2
Digital sound	62	6.2-6.3=-0.1	6.2.0
Easy search	60	5.9-6.8=-0.9	54.0
Photos &videos	58	5.6-6.3=-0.7	40.6
Clear motion rate	54	6.3-6.8=-0.5	27.0
Wide colour enhancer plus	56	5.8-6.4=-0.6	33.6
Micro dimming	53	4.3-6.5=-2.2	-116.6
Digital natural sound	51	5.4-6.1=-0.7	35.7
Connect share movie	50	5.3-7.0=--1.7	85.0
Apps for Television	42	5.5-5.9=-0.4	16.8
All share play	45	4.5-6.0=-1.5	67.5
Wi-Fi built-in	40	4.7-6.7=--2	80.0
Smart hub	38	4.3-5.2=-0.9	-34.2
Smart interaction	35	3.3-5.5=-2.2	77.0
Smart touch remote	46	4.4-4.6=-0.2	9.20
3Dblu -ray player	47	4.2-6.2=--2	94.0
Wireless keyboard compatible	40	3.8-6.4=-2.6	-104.0
Dual core processor	36	3.6-6.3=--2.7	-97.2
Slim LED design	61	5.8-6.6=-0.8	48.8
Skype compatible	43	3.2-6.4=-3.2	137.6

The quality improvement index brought out the product features that could be considered as feature gain for attaining a competitive advantage in the LED television market.

Figure 2. Quality Improvement Index for LED Televisions



Managerial Implications

(1) Customer requirements improve their expectations. Must-be requirements in LED televisions such as picture quality, amazing view, wi-fi built in, wireless keyboard, and slim design are the decisive features, and if they are not provided, the customer will not be interested in the product at all.

(2) One dimensional requirement such as rotate viewing angle, Skype compatible, and clear motion picture is explicitly demanded by customers.

(3) Attractive requirements such as smart touch remote and digital natural sound engine are surprises to customers and would enhance customer delight.

(4) Price premium is a major hindrance for non-buying of LED televisions. The cost of manufacturing and cost of marketing are to be kept under check.

(5) Sustained improvement in product features would lead to increase in customer requirements of LED televisions.

Conclusion

In this study, the product criteria which have the greatest influence on customers' satisfaction can be identified. Classifying product requirements into must-be, one-dimensional, and attractive dimensions were used to focus on priorities for product development. It is very important for LED televisions to invest in improving must-be requirements such as wi-fi built-in, which are highly expected from customers, and it is also better to improve the one-dimensional feature namely, Skype compatible or attractive requirements namely 3D conversion and photos and videos sharing as they have a greater influence on perceived product quality and consequently, on the customers' level of satisfaction. In the product development stage, if two product requirements cannot be met simultaneously due to technical or financial reasons, the criterion which has a greater influence on customer satisfaction can be identified. Must-be, one-dimensional, and attractive requirements differ, as a rule, in the utility expectations of different customer segments. From this starting point, customer-tailored solutions for special problems can be elaborated, which guarantees an optimal level of satisfaction in the different customer segments. Discovering and fulfilling attractive requirements create a wide range of possibilities for differentiation. A product which merely satisfies the must- be and one-dimensional requirements is perceived as average and ,therefore, interchangeable.

Customer satisfaction can be optimally combined with quality function deployment. A prerequisite is to identify customer needs, their hierarchy, and priorities. In this study, the importance of individual product features for customers' satisfaction is established, and thus, it creates the optimal pre- requisite for process-oriented product development activities. The results of the study indicate towards important marketing implications of LED television not only based on customer satisfaction but most for companies in identifying competitive advantage of their product features to sustain in the market by upholding customer delight. The significance of the study lies in gaining knowledge about consumer purchase behaviour towards LED television and expectation on potential features that might be incorporated in the product development process. The customers' needs of salient features based on their experience in usage of LED televisions was considered. The consideration for product development would only come from well-informed customers who are fully committed to their rights to quality, service, and technology. Nevertheless, before any product features are incorporated or changed, it is necessary to evaluate the current state of customers' satisfaction and their expectations.

Limitations of the Study and Scope for Further Research

The study focused on assessing product requirements from customer perspectives for product development. The cost benefit analysis of incorporating such features is not taken into account. Hence, this aspect can be considered in future studies.

References

Bottani, E., & Rizi, A., (2006) Strategic management of logistics service: A Fuzzy QFD approach. *International Journal of Production Economics, 103* (2), 585-599. doi:10.1016/j.ijpe.2005.11.006

Browing, T.R., Fricke, E., & Negele, H. (2006). Key concepts in modelling product development processes. *Systems Engineering, 9* (2), 104-128.

Drechsler, W., Natter, M., & Leeflang, P. S. H. (2013). Improving marketing's contribution to new product development. *Journal of Product Innovation Management, 30* (2), 298-315.

Fain, N., Kline, M., & Duhovnik, J. (2011). Integrating R&D and marketing in new product development. *Journal of Mechanical Engineering, 56* (7 - 8), 513 - 522.

Fujita, K., & Matsuo, T. (2006). Survey and analysis of utilization of tools and methods in product development. *Trans Japanese Soc Mech Eng Ser , 72* (713), 290 -297.

Garibay, C., Gutierrez, H., & Figueroa, A. (2010). Evaluation of a digital library by means of quality function deployment (QFD) and the Kano model. *The Journal of Academic Librarianship, 36* (2),125-132. doi:10.1016/j.acalib.2010.01.002

Griffin, A. & Hauser, J. R. (1993). The voice of the customer. *Marketing Science, 12* (1), 1-27.

Hanan, M., & Karp, P. (1989). *Customer satisfaction : How to maximize, measure and market your company's ultimate product*. New York : American Management Association.

Hari, A., Kasser, J.E., & Weiss, M.P. (2007). How lessons learned from using QFD led to the evolution of a process for creating quality requirements for complex systems. *Systems Engineering, 10*(1),45-63. DOI: 10.1002/sys.20065

Hashim, A. M. , & Dawal, S. Z. (2009). Kano Model and QFD integration approach for ergonomic design improvement. *Procedia - Social and Behavioral Sciences, 57*(9),22-32. doi:10.1016/j.sbspro.2012.09.1153

Hoyer, W. D., Chandy, R., Dorotic, M., Krafft, M., & Singh, S. (2010). Consumer cocreation in new product development. *Journal of Service Research, 13*, 283-296.

Juyal, S. M. (2013). Effect of demographic factors on consumer buying behaviour of durable goods. *Indian Journal of Marketing, 43*(12), 24 -33.

Kano, N., Seraku, N., Takahashi, F., & Tsuji, S. (1984). Attractive quality and must-be quality. *Hinshitsu: The Journal of Japanese Society for Quality Control, 14* (2),39-48.

Kar, S. K., & Bhoi, M. (2014). Used durables and online buying: An attitudinal study of Indian youth. *Indian Journal of Marketing, 44* (7), 30 -47.

Kelsey, K.D., & Bond, J.A. (2001). A model for measuring customer satisfaction within an academic centre of excellence. *Managing Service Quality : An International Journal, 11* (5), 359 - 368.

Kobayashi, H., (2006). A systematic approach to eco-innovative product design based on life cycle planning. *Advanced Engineering Informatics, 20* (2), 113-125. doi:10.1016/j.aei.2005.11.002

Kondo, Y. (2001). Customer satisfaction: How can I measure it? *Total Quality Management, 12* (7-8), 867 - 872.

Kurt, M., & Hinterhuber, H.H. (1998). How to make product development projects more successful by integrating Kano's model of customer satisfaction into quality function deployment. *Technovation, 18* (1), 25 - 38. doi:10.1016/S0166-4972(97)00072-2

Lancaster, G., & Massigham, L. (1994). *The essentials of marketing: Text and cases*. Hong Kong : McGraw-Hill.

McKay, A., dePennington, A., & Baxter, J. (2001). Requirements management: A representation scheme for product. *Computer-Aided Design, 33* (7), 511-520.

Nikolaos, T., Hultink, E.J., & Susan, H. (2004). Navigating the new product development process. *Journal of Industrial Marketing Management, 33* (7),619-626.

Patrick, J. (1997). *How to develop successful new products.* Chicago, IL : NTC Pavitt.

Poel, I.V.D. (2007). Methodological problems in QFD and directions for future development. *Research in Engineering Design, 18* (1), 21-36.

Shahin, A. (2003). Integration of FMEA and the Kano model : An exploratory examination. *International Journal of Quality and Reliability Management, 21* (7), 731-746.

Tseng, M., & Piller, F.T. (2003). *The customer centric enterprise: Advances in mass customization and personalization*. New York : Springer Verlag.

Witell, L., & Lofgren, M. (2007). Classification of service quality attribute. *Managing Service Quality : An International Journal, 17*(1), 54 - 73. DOI : http://dx.doi.org/10.1108/09604520710720674