Determinging Structure Of Customer Priorities In Emarketplaces

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Abstract: In the changing market place, e-market places are the major players. It has large number of products and innovative services. Selection of online retail stores becomes increasingly important in todays competitive environment. Several elements need to be considered by the customers before choosing a provider. The present study is related to online retail stores. It is a customer oriented study and it is done to assess the importance of different factors in online buying process. The study takes 120 customers across Kozhikode district and four online retail stores (Amazon, Flipkart, Snapdeal and E-bay). Five constructs (Placeholder1) and nineteen variables were used. Fuzzy Analytical Hierarchy Process was used to test various assessments. It was found that largest collection of goods, material appropriateness, flexibility, diverse payment options and advertisement are the most important factors considered by the customers. Again, it is found that amazon does better in two areas, i.e...stock and promotion. Flipkart ranks first in delivery. Snapdeal and E-bay placed first at price and service quality respectively.
Key Words: Onile Retail stotres, stock, delivery, service quality, price, promotion, FAHP.

I. INTRODUCTION

Human civilization starts with the invention of novel products and technologies. From barter to e-stores, people constantly look for improvement. Substitution of goods for goods is the foremost course of organized market recorded in human history. Henceforth, the idea of medium of exchange was derived. It is considered to be a revolutionary milestone. And so, people begin to quantify the value of goods or materials. As a result, the concepts of independent markets are slowly derived. In addition, industrial revolution fuels the growth. Thinkers like Karl Marx, Keynes and Schumpeter have theoretically defined what is market and how it performs.

Phenomenal changes have happened in the structure and working of the markets. Now, firms are exploring the revolutionary opportunities opened by the electronic marketplaces. Electronic stores, simply e-stores, are the imaginary places where the buyer and seller can easily meet and serve each otgher's needs. In India, a large number of online platforms are available, like flipkart, Amazon, Snapdeal, e-bay, etc. Because of the poor infrastructure and lack of awareness, Indian online stores are not that much modern as in Europe and the US. However, of late the emarketplaces have been evolving at a much faster pace than any time before.

Being a fastest developing economy, India has a great opportunity for growth in this area, like employment generation, FDI inflows, etc. Both statistics and financial data strongly establish the presence of estores and emarketplaces in the Indian market. Recent statistics explains the rapid development of Indian retail e-commerce sales, which have risen manifold, from USD 2.3 billion in 2012 to an estimated USD 17.5 billion in 2015. During 2015, the proportion of retail e-commerce sales as a percentage of total retail sales in India is 0.9 per cent, which is expected to go up to 1.4 per cent in 2018.

The estores have to meet certain conditions to attract customers such as availability of inventory, flexible delivery options, superior service quality, competitive cost, and postmodern promotional strategies. The effective mixture of the same would attract more customer traffic to such emarketplaces. The present study is an attempt to explore what people expect from emarketplaces. For this, four online stores were taken, viz... Flipkart, Amazon, Snapdeal and E-bay. The study used Analytical Hierarchical Process (AHP) for drawing customer's likes and dislikes.

Statement of the problem

Online retail stores are now becoming the part of the Indian mainstream economy. Because of large variety of items, price ranges and delivery flexibility, more people tend to prefer online shops. There is a tendency among customers to switch emarketplaces. It is difficult to satisfy them fully.

A buying decision involves a rational process, where cost-benefit trade off happens in the minds of buyers. Price, cost, delivery conditions, promotional campaigns,

and service quality are the parameters which the customers are primarily concerned with. Each of them has different weights for different customer segments. The one who searches for superior quality, price is not a serious constraint. Price conscious buyers always look for price offs, discount, offers etc. An online store with effective delivery and promotional campaigns can retain their customers in future. The proposed study is an investigation to explore how customers value their online buying experience and also to find out their priorities.

Based on the research problem, four research questions were set. They were.

1. What are the factors that the customers use in choosing online retail stores?
2. What are the most important elements of online buying process?
3. Which online provider does better and on which service dimension?
4. Are there any scope for categorising customers based on service dimensions?

The objectives of the study

1. To identify the factors which influence the customers in choosing online retail stores.
2. To identify if customers have any factor priority in online buying.
3. To explore which online provider does better and in which area.
4. To categories the customers on the basis of their service preference.

Scope of the study

The study is geographically limited to the district of Kozhikode. A sample of 120 respondents was selected for the study. Based on the available literature, four kinds of fast moving products were taken. i.e. Mobiles & accessories, electronics, apparels & fashions, and books & stationeries. Stock, delivery conditions, service quality, price and promotion are the constructs used for the study. Finally, four online retail stores were taken viz.Amazon, Flipkart, Snapdeal and E-bay for the study.
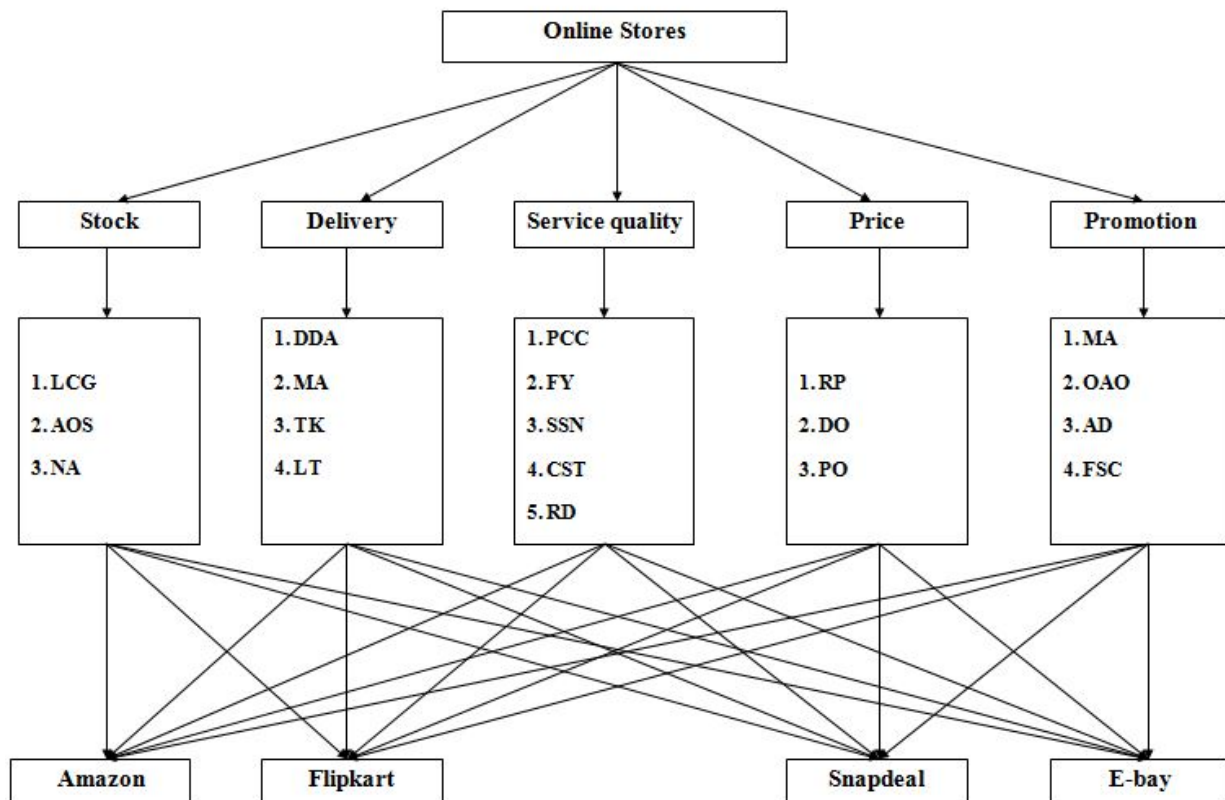
Conceptual Model for the study

Fig. 1: Conceptual model used for the study

Variables used for the study

The study used five constructs and nineteen variables. Age of the respondents, product type and name of the online stores were the three other variables used

Stock	Delivery	Service quality	Price	Promotion
Large collection of goods (LCG)	Delivery date appropriateness (DDA)	Packaging and Carrying Capability (PCC)	Reasonable Price (RP)	Mobile App (MA)
Availability of stock (AOS)	Material appropriateness (MA)	Flexibility (FY)	Discounts and Offers (DO)	Only App Offers (OAO)
Newest arrival (NA)	Technological knowledge (TK)	Sale and Service Network (SSN)	Payment Options (PO)	Advertisements (AD)
	Lead time (LT)	Customer Satisfaction (CST)		Festival Shopping Carnivals (FSC)
		Research and Development Acttivities (RD)		

II.   Methodology

A descriptive research design, based on Fuzzy Hierarchy Process, was used to collect and analyze the data. Four major online retail stores that bore an excellent track record were used for the study.

Analytical Hierarchy Process

AHP is a multi criteria decisionmaking method that was originally developed by Prof. Thomas L. Saaty. It is based on inherent human ability to make sound judgement about the problem. AHP starts with the construction of hierarchies. Then it moves on prioritization to find out relative importance. Prioritization involves eliciting judgements in response to questions about the dominance of one element over another with respect to a property. The scales used for the same is given below;

Table 1: Scales

Intensity of importance	Definition	Explanation
1	Equal importance	Two activities contribute equally to the objective.
3	Moderate importance	Experience and judgment slightly favour one activity over another.
5	Strong importance	Experience and judgment strongly favour one activity over another.
7	Very strong importance	An activity is favoured very strongly over another; its dominance demonstrated in practice.
9	Extreme importance	The evidence favouring one activity over another is of the highest possible order of affirmation.
2,4,6,8.	For compromising between the above values.	Sometimes one needs to interpolate a compromise judgment numerically because there is no good word to describe it.

Fuzzy Analytical Hierarchy Process (FAHP)

AHP is incapable of managing uncertainty associated with the mapping of one's perception to a number. Hence, Fuzzy Analytical Hierarchy Process (FAHP) is developed. It is the application of Fuzzy logic into AHP. It is an efficient tool to handle the fuzziness of the data involved in the decision making. It uses triangular fuzzy numbers for making judgment. The present study is based on FAHP to find out the priorities.

Profile of the Respondents

For the purpose of data collection, a sample of 120 customers was selected from Kozhikode district. The profile of the respondents is given below:

1. **Age wise representation of the sample (** Below 18 are excluded)

Table 2: Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Age category	18-25	7	5.8	5.8	5.8
	25-30	57	47.5	47.5	53.3
	30-35	31	25.8	25.8	79.2
	35-40	15	12.5	12.5	91.7
	40-45	10	8.3	8.3	100.0
	Total	120	100.0	100.0	

Product wise representation

It includes four categories of items, depending on the popularity and response.

Table 3: Products

		Frequency	Percent	Valid Percent	Cumulative Percent
Products	Cell phones and accessories	53	44.2	44.2	44.2
	Books and stationeries	19	15.8	15.8	60.0
	Fashions and apparels	15	12.5	12.5	72.5
	Electronics	33	27.5	27.5	100.0
	Total	120	100.0	100.0	

Online Stores

It includes four online stores based on available literature and popularity.

Table 4: Store

		Frequency	Percent	Valid Percent	Cumulative Percent
Stores	Flipkart	33	27.5	27.5	27.5
	Amazon	32	26.7	26.7	54.2
	Snapdeal	36	30.0	30.0	84.2
	E-bay	19	15.8	15.8	100.0
	Total	120	100.0	100.0	

Data analysis

In this study, data analysis was done in three stages i.e. pair wise comparison of variables and constructs, prioritization of variables in each constructs, and prioritization of each construct among the selected online retail stores. Mean scores of each variable were taken to draw the pair wise comparison and normalization matrix.

Algorithm of FAHP method

According to the method of Chang's extent analysis, each object is taken and extent analysis for each goal performed respectively. Therefore, m extent analysis values for each object can be obtained, with the following signs:

$$M^1_{gi}, M^2_{gi}, \ldots\ldots M^m_{gi}, \qquad i = 1, 2, \ldots, n,$$

Where M^j_{gi} (j=1, 2...3) all are Triangular Fuzzy Numbers (TFN's). The steps of Chang's extent analysis can be given as in the following;

Step 1: the value of fuzzy synthetic extent with respect to the ith object is defined as;

$$S_i = \sum_{j=1}^{m} M_{gi}^{j} \otimes \left[\sum_{i=1}^{n} \sum_{j=1}^{m} M_{gi}^{j} \right]^{-1}$$

To get $\sum_{j=1}^{m} M_{gi}^{j}$, perform the fuzzy addition operation of m extent analysis values for a particular matrix such that:

$$\sum_{j=1}^{m} M_{g}^{j} = \left(\sum_{j=1}^{m} l_j, \sum_{j=1}^{m} m_j, \sum_{j=1}^{m} u_j \right)$$

$$\left[\sum_{j=1}^{n} \sum_{j=1}^{m} M_{gi}^{j} \right]^{-1}$$

And to obtain $\left[\sum_{j=1}^{n} \sum_{j=1}^{m} M_{gi}^{j} \right]^{-1}$, perform the fuzzy addition operation of M_{gi}^{j} (J=1,2,...m) values such that:

$$\sum_{i=1}^{n} \sum_{j=1}^{m} M_{g}^{j} = \left(\sum_{i=1}^{n} l_i, \sum_{i=1}^{n} m_i, \sum_{i=1}^{n} u_i \right)$$

And then compute the inverse of the vector above, such that:

$$\left[\sum_{i=1}^{n} \sum_{j=1}^{m} M_{gi}^{j} \right]^{-1} = \left(\frac{1}{\sum_{i=1}^{n} u_i}, \frac{1}{\sum_{i=1}^{n} m_i}, \frac{1}{\sum_{i=1}^{n} l_i} \right)$$

Step 2: As $M_1=(l_1,m_1,u_1)$ and $M_2=(l_2,m_2,u_2)$ are two triangular fuzzy numbers, the degree of possibility of $M_2=(l_2,m_2,u_2) \geq M_1=(l_1,m_1,u_1)$ defined as;

$$V(\tilde{M}_2 \geq \tilde{M}_1) = \sup_{y \geq x} \left[\min \left(\mu_{\tilde{M}_1}(x), \mu_{\tilde{M}_2}(y) \right) \right]$$

And can be equivalently expressed as follows;

$$V(\tilde{M}_2 \geq \tilde{M}_1) = hgt(\tilde{M}_1 \cap \tilde{M}_2) = \mu_{M_2}(d)$$

$$= \begin{cases} 1, & if \quad m_2 \geq m_1 \\ 0, & if \quad l_1 \geq u_2 \\ \dfrac{l_1 - u_2}{(m_2 - u_2) - (m_1 - l_1)}, & otherwise \end{cases}$$

Step 3: the degree possibility for a convex fuzzy number to be greater than k convex fuzzy $M_i(j=1,2,k)$ numbers can be defined by

$$V(M \geq M_1, M_2, ...M_k) = V[(M \geq M_1) \ and \ (M \geq M_2) \ and....and \ (M \geq M_k)]$$

$$= \min \ V(M \geq M_i), \ i = 1,2,3,....,k$$

Assume that d (A_i) = minV ($S_i \geq S_k$)

For k=1, 2... n; k≠i. Then the weight vector is given by

$$W' = (d'(A_1), d'(A_2), ..., d'(A_n))^T$$

where $A_i = (i = 1,2,...n)$ are n elements.

Step 4: Via normalization, the normalized weight vectors are

$$W = (d(A_1), d(A_2), ..., d(A_n))^T$$

Where W is a non-fuzzy number (Cakir, 2009).

Pair wise comparison and Normalization matrix
It has two parts; one for analysing the weights of each variable in a construct, and other to analyse the weights of each construct between the four online retail stores.

Stage 1. Weights of each variable in a construct.
It includes five constructs and nineteen variables.

1. **Stock**
It includes three variables, i.e... Large collection of goods (LCG), Availability of stock (AOS) and Newest arrival (NA).

Table 5:Pair wise comparison

	LCG	AOS	NA
LCG	1	7.416667	7.15
AOS	0.134831	1	7.466667
NA	0.13986	0.133929	1
Total	1.274692	8.550595	15.61667

Table 6: Normalization matrix

	LCG	AOS	NA	Priority vector
LCG	0.784503	0.867386	0.457844	0.703245
AOS	0.105776	0.116951	0.478122	0.233616
NA	0.109721	0.015663	0.064034	0.063139

Table 6 shows the priority details of LCG, AOS and NA with 70%, 23% and 7% weights respectively. Large collection of goods becomes the attractive element for the customers while selecting an online retail store. Newest arrival shows the least consideration.

Delivery
It includes four variables, i.e... Delivery date appropriateness (DDA), Material appropriateness (MA), Technical knowledge (TK) and Lead time (LT).

Table 7: Pair wise comparison

	DDA	MA	TK	LT
DDA	1	0.550459	0.909091	1.153846
MA	1.816667	1	8.571429	0.413793
TK	1.1	0.116667	1	0.9375
LT	0.866667	2.416667	1.066667	1

Table 8: Normalization matrix

	DDA	MA	TK	LT	Priority Vector
DDA	0.209059	0.134791	0.078728	0.329187	0.187941
MA	0.379791	0.24487	0.742296	0.118053	0.371253
TK	0.229965	0.028568	0.086601	0.267464	0.15315
LT	0.181185	0.59177	0.092375	0.285295	0.287656

Material appropriateness and Lead time dominates the list, with values 37% and 29% respectively. Delivery date appropriateness and technical knowledge came last in customer choice.

Service Quality

It includes five variables. i.e. packaging and carrying capability, flexibility, sales and service network, customer satisfaction and research and development activities.

Table 9: Pair wise comparison

	PCC	FY	SSN	CST	RD
PCC	1	2.222222	0.952381	7.5	0.714286
FY	0.45	1	1.818182	2.857143	8.933333
SSN	1.05	0.55	1	1.621622	0.625
CST	0.133333	0.35	0.616667	1	1.538462
RD	1.4	0.11194	1.6	0.65	1

Table 10: Normalization Matrix

	PCC	FY	SSN	CST	RD	Priority vector
PCC	0.247934	0.524832	0.159069	0.550307	0.055755	0.307579
FY	0.11157	0.236174	0.303677	0.209641	0.697313	0.311675
SSN	0.260331	0.129896	0.167022	0.118985	0.048786	0.145004
CST	0.033058	0.082661	0.102997	0.073374	0.120088	0.082436
RD	0.347107	0.026437	0.267235	0.047693	0.078057	0.153306

FY and PCC have almost equal scores (31.17% and 30.76%). CST comes last in the list. This does not mean that customers are least satisfied. It happened as a result of related comparison process. On the whole, customers are looking for safest and innovative delivery mechanism. High scores on PCC, FY and RD leads to that conclusion.

It includes three variables, i.e... Reasonable price, Discounts and offers, and payment options.

Price Table 11: Pair Wise Comparison

	RP	DO	PO
RP	1	0.196078	0.177515
DO	5.1	1	0.335196
PO	5.633333	2.983333	1

Table 12: Normalization Matrix

	RP	DO	PO	Priority Vector
RP	0.085227	0.046915	0.117349	0.083164
DO	0.434659	0.239268	0.221586	0.298504
PO	0.480114	0.713817	0.661065	0.618332

From the above table, it follows that customers prefer diverse payment options (62 percent) than cheap price and discounts. Discounts and offers are placed second, having a weight of 30 percent. Reasonable price got only 8 % weight.

Promotion

It includes four variables. i.e... Mobile App (MA), Online App Offers (OAO), Advertisement (AD) and Festival Shopping Carnivals (FSC). 'Online app offers' implies the offers exclusively for those who have online mobile application.

Table 13: Pair Wise Comparison

	MA	OAO	AD	FSC
MA	1	0.294118	0.447761	0.759494
OAO	3.4	1	0.909091	0.218182
AD	2.233333	1.1	1	8.983333
FSC	1.316667	4.583333	0.111317	1

Table 14: Normalization matrix

	MA	OAO	AD	FSC	Priority vector
MA	0.125786	0.042153	0.181414	0.06929	0.104661
OAO	0.427673	0.143319	0.368326	0.019905	0.239806
AD	0.280922	0.157651	0.405159	0.819572	0.415826
FSC	0.165618	0.656878	0.045101	0.091232	0.239707

From the above table it is clear that customers gives more priority to AD (42 % weight). OAO and FSC scores almost equal weights (23.9806% and 23.9707% respectively). MA comes at the bottom line.

Step 2. Weights of constructs among online retail stores.

Based on reviews, the study concentrates on four online retail stores. Viz... Amazon, E-bay, flipkart and Snapdeal. Step 2 deals with finding the priority weights of constructs of selected online retail stores. The result is capable of determining the online store which fares better than others on service dimenstions.

Table 15: Priority weights of online retail stores

Priority weights	Amazon	E-bay	Flip kart	Snap deal
Stock	0.33	0.16	0.25	0.26
Delivery	0.21	0.20	0.38	0.21
Service quality	0.20	0.30	0.24	0.26
Price	0.24	0.22	0.21	0.33
Promotion	0.48	0.16	0.20	0.16
Average Weights	**0.292**	**0.208**	**0.256**	**0.244**

From the table, it is clear that Amazon (0.33) dominates first position in 'stock', followed by Snapdeal (0.26), flipkart (0.25) and e-bay (0.16). In case of 'Delivery', Flipkart ranks first (0.38) followed by Amazon (0.21), Snapdeal (0.21) and E-bay (0.20). again, Amazon ranks first in 'promotion' too (0.48). E-bay ranks first in 'Service quality'(0.30) whereas, snap deal placed first at 'Price' (0.33). Overall, Amazon scores 0.292, e-bay scores 0.208, flipkart scores, 0.256, and Snapdeal scores 0.244 indicating Amazon as a better online retail store by the customers, followed by flipkart at second, Snapdeal third, and E-bay at fourth.

Findings of the study

1. Large collection of material and availability of stock plays a major role in customer's buying decision. Customers are highly disturbed when they come to know that the stocks are limited or unavailable. It may restrict them to visit the sites again.

2. Customers are looking for material appropriateness and shortest lead time. Faulty despatch of goods diminishes the credibility and acceptability of the online retail stores.

3. Good quality packaging and flexibility becomes more relevant when it comes to service quality. Customers expect perfect delivery without any damage and mistakes, and also they are demanding efficient sales and service networks.

4. Customers are highly favourable for innovative and modern payment techniques. They strongly believe that the convenient payment options will improve their buying standards.

5. Customers opined that the advertisements in printed, visual and online media lead them to choose a better service provider. New ideas like 'mobile app', 'only app offers' and 'festival shopping carnivals' have considerable impact on the customer decision making.

6. On the whole, based on the aggregate mean score, customers believe that Amazon is the best, followed by flipkart, Snapdeal and E-bay. In conclusion, Amazon is the leader in stocking and promotion. Flipkart is superior at delivery. Snapdeal and E-bay ranks first in price and service quality respectively.

III. CONCLUSION

Unlike traditional buying, customers have to evalauate anumber of factors in emarketplace choice. It is very difficult for an online buyer to evaluate these factors and choose the best emarketplace. The present study was an attempt to explain the various service dimenstions considered by the customer in choosing the stores. From the study, it was found that the largest collection of goods, material appropriateness, flexibility, diverse payment options and advertisement are the elements having the highest priority among the five constructs. The respondents have put Amazon on top in rating the emarketplaces in terms of service dimensions. Flipkart comes second, Snapdeal at third place and E-bay at the fourth among the emarketplaces.

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