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USING ANALYTIC HIERARCHY PROCESS TO DEVELOP HIERARCHY STRUCTURAL MODEL OF CONSUMER DECISION MAKING IN DIGITAL MARKET

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ABSTRACT

In today's electronic era, e-commerce market is a very fast growing market. With the proliferation of the internet and web applications, customers are increasingly interfacing and interacting with web-based applications. They are shifting themselves offline to online which is creating challenging environment for the service providers to meet them according to their customise needs. It is, therefore, not only to find out the important but also to prioritise the factors which influence customer to online purchasing. The main purpose of this study is to develop a Hierarchy Structural Model (HSM) of consumer decision making in the digital marketplace. To achieve the objective of the study, criteria and their sub-criteria are determined through an extensive literature review and a structured questionnaire is prepared to data from experts through a personal interview on the scale of 1 to 9. Analytic Hierarchy Process (AHP), a multi-criteria decision making mathematical tool has been applied for analysis of the importance of each criteria and to develop a hierarchy of criteria for importance. As per weight estimated through HSM modal, the criteria "information and e-service quality" is the most important one followed by the criteria "online reputation" and "incentives and post-purchase" in online purchasing. Online service providers should focus on these essential criteria to enhance their e-service quality, satisfaction and retention consumer and their online reputation.

Keywords: customise, Hierarchy Structural Model (HSM), Analytical Hierarchy Process (AHP), incentives and post-purchase, information, online reputation, e-service quality

INTRODUCTION

In the 21th century, the younger generation is taking more interest to join the digital world. People are coming up and getting familiar with the internet and its products. With increasing at the rate of 40% of broadband connectivity has around 205 million internet user in November 2013 in India (Chakravarti, 2013). More people will have over the internet the more potential can have for online

purchasing (Rahimi & El Bakkali, 2013). The rapidly growing retail markets in India are estimated $ 470 billion in 2011 and it will grow by $ 675 billion by 2016 and $ 850 billion by 2020 (The Associated Chambers of Commerce and Industry of India, ASSOCHAM, 2013). The growth rate of Indian e-commerce is more than 30% as compared to global; it is just 6%–7% and it is predicted that the e-commerce market will grow by more than 57% in 2012–2020 (ComScore, 2013). This is the decisive sign of opportunities in online retail. India is the world's third largest in online purchasing market only after the US and China and it was worth $ 2.5 billion in 2011, $ 14 billion in 2012, and expected to grow to $ 2.4 billion by 2015 (Widger, Noble, Sehgal, & Varon, 2012).

The rapid growth of online purchasing is due to greater emphasis on customers' efficient use of time and increasing number of customers having knowledge about computer. Earlier there was a tradition, "First touch it, feel it then buy it" but online shopping has changed the scenario. Now with the penetration in the internet, more and more people are coming forward and making online purchases. Even online shopping sites are getting millions of dollars of investment from Indian as well as overseas investors. Indian e-commerce business has witnessed a growth rate of around 80% in 2013 and it is also assumed that out of 150,000, only 10,000 pin codes are serviced (The Indo-Asian News Service [IANS], 2014). The rapid increment in the popularity of online purchasing is due to the development of the internet and its penetration to ordinary people. However, to provide total customer satisfaction, shopping sites need to address many issues such as security, quality, assurance and right information (Hwang & Kim, 2007). All data and statistics are in favour of Indian e-commerce, so more and more companies are coming forward to do business and want to create its own space but the main challenge will be to attract Indian customers and to provide total value to them. With the growth in the smartphone market and cheaper broadband services, it is expected that more and more customers will join the group.

Due to information technology and the internet, information about any product is no more than a click away. We are witnessing a new product or technology every month. Technology is changing rapidly. The success of online purchasing business completely depends upon the understanding of the customers' characteristics like needs, purchasing pattern, influencing criteria, and their priorities (Kumar & Dash, 2014). Online customers have become more conscious and they have many alternatives than offline purchasing. To attract, engage, make them buy and retention are the most challenging job for online service providers. It is, therefore, not only to figure out the important but also to prioritise the factors which influence customers to purchase online. The study develops a Hierarchy Structural Model (HSM) of consumer decision making in the digital marketplace to their priority of the identified criteria.

CONCEPTUAL FRAMEWORK OF RESEARCH MODEL

There are various criteria which affect the customer's purchase decision. Constantinides (2004) defines a model which includes three criteria that influence customer's buying behaviour: Marketing mix, uncontrollable criteria (lifestyle, income, and trends) and controllable criteria (website design, security, product quality). The criterion "website design" is one of the important influence factors for customer (Constantinides, 2004). The study considered this criterion to know the priority of customers. Similarly, Davis (1989)—in his Technology Acceptence Model (TAM)—defines "perceived usefulness" and "perceived ease-to-use" as the influence factor for customer's decision. This study has identified five criteria and the sub-criteria, which influence customers during their online purchasing. The five criteria are:

1. Personal Innovativeness on Information Technology (PITT)
2. Web quality dimension
3. Information and e-service dimension
4. Online reputation
5. Incentives and post purchase service

Personal Innovativeness on Information Technology (PIIT)

Agarwal and Prasad (1998) studied about the willingness of one to use a new technology. Keisidou, Sarigiannidis and Maditinos (2011) defined PIIT as "the degree to which one is ready to use modern technology over his peer group." If customers are having fun with the technology, they would adopt more quickly (Cheng, 2011) and they would perceive more usefulness. As Indian e-commerce is not the older concept, and there are more opportunities to explore business in this new platform, it is still an untouched area. But due to rise in penetration of IT and the internet, information is flowing massively. Every day we have something innovative around us. The world is changing rapidly that one new technology gets outdated within a few months. Customers need to aware of those technologies and they should also come forward to try them. A report says that 35% of online customers are aged between 18 years and 25 years old, 55% are between 26 to 35 years old and 8% belongs to the age group of 36 to 45 years old, while only 2% are in the age group of 45 years and above. According to Sheth (2013), 65% of online shoppers are male and 35% of them are female. The survey shows that almost 90% online customers are belong to the young group (Sheth, 2013). The reason behind this is they are conscious of new technology and they want to be innovative (Sheth, 2013).

The customers are also be able to get familiar with uncertainty and can develop a more positive attitude towards acceptance and it showed that high levels of PIIT affect customers' attitude towards online purchasing. Technology adoption shows how much you are keen to use and get familiar with the updated technology (Rogers, 2010). Now we have many online shopping websites, which provide mobile apps and customers can also buy through the apps. Lu, Yao and Yu (2005) found that PIIT has a positive impact on wireless internet services via mobile technology. As the demand for such application is increasing many organisations are investing huge money in this area (Lu et al., 2005). Self-efficacy reflects one's ability to use computers and new technology. Though it is expected that one has knowledge of a particular product, hesitation comes while making the purchase decision. The study finds that peer group or seniors' advice gives positive push towards a final decision (Kumar & Dash, 2014).

Web Quality Dimension

Personal innovativeness influence customers to come across the technology or product but to purchase online, the seller need to provide a platform and this could be a website, an internet user interface. Customers visit website, get all kinds of information and take the decision whether to purchase or not (Cheng, 2011; Kumar & Dash, 2013). Web quality dimension includes various aspects of website like website quality, design and information (Kim & Kim, 2004). The average speed of the internet in India is slower than the average speed of the world. Slow internet speed would cause crashed and unstructured website. So the website has to maintain quality but has to keep it mind that the webpage does not take too much loading time. It could result in a major flop for the website owners (Xiao, Wang, Fu, & Zhao, 2012). The information supplied on the website should also match with the customer's expectation. Sometimes customers want to refine a search on the basis of the few characteristics like operating system, design, price, size and rating (Yang, Cai, Zhou, & Zhou, 2005). Websites have to provide all these indispensable tools with greater efficiency. If the website provides quality information, customers will surely come to visit again for the information keeping the purchase decision aside (Cristobal, Flavián, & Guinaliu, 2007). Search engines or navigation system also affect customers' perception. They would like to navigate easily to what they are looking for and a better solution is always expected (Kumar & Dash, 2013).

Information and e-Service Dimension

Customers visit and interact with the website. They pass through the virtual shopping mall and search for information. Customers have to provide their private information such as home address and mobile number if they want to purchase something. To pay online they need to give their ATM/Credit/Debit

card details, which are highly sensitive (Kim, Ferrin, & Rao, 2008). Some customers are afraid of giving such sensitive information and they are haunted by hackers and fraud (Mann & Sahni, 2013). Some shopping websites show the recent browsing history, which customers do not want to have. They want to maintain their search teams hidden. Online shopping customers cannot interact directly with the sellers and they do not have face-to-face conversation. To purchase from an unknown seller, trust must be built between both parties (Koufaris & Hampton, 2004). Trust is created by repeated exchange of services and it takes a minute. Many studies find that if a customer finds the content more accurately, they will create a good reputation for the website and willingly visits the website again (Gefen & Straub, 2004). Accuracy is another criteria that customers expect from websites. User-friendly system with truthful information without spending much time leads to end user satisfaction (Ruimei, Shengxiong, Tianzhen, & Xiling, 2012). In this study, criteria like privacy, security, information quality and trust have been analysed. One more new thing which has been added is "Product Comparison" (Senecal & Nantel, 2004). Now many websites offer a tool called "comparison" where two or three products can be selected from the same category says mobile and can be compared. One can compare its operating system, memory, Random Access Memory (RAM), warranty, reviews etc. This feature provides customers to shortlist the product list and it also helps customers to purchase the best, which matched their expectations.

Online Reputation

With the growth of internet and e-commerce, business online trust has become a major issue (Fan, Tan, & Whinston, 2005; Hsu, Ju, Yen, & Chang, 2007). The perception of quality is influenced by the customers' past experience, website's performance and some intangible criteria (Kuo, Wu, & Deng, 2009; Kumar & Dash, 2014). Once a customer decided to purchase a product, they will check the reputation of the website and how many people trust the service of the website. Trust and reputation are two important criteria in online purchasing (Jøsang, Ismail, & Boyd, 2007). To make the website trustworthy we need to create a reputation (Rahimi & El Bakkali, 2013). In Centralized Reputation System, data or feedbacks have been gathered from customers who have prior experience and stored and analysed by some central mechanism (Hung et al., 2012). Nowadays many websites are having such system. Customers give rating to sellers and centralised system makes these assessing public. Seller rating is another criterion which affects customers' buying decision. Today almost every shopping website provides a platform to the sellers to sell their product. In return, they take a commission from the sellers but a buyer would prefer a website which has more reputation (Jøsang et al., 2007). Customers have great faith in this reputation system and they would continue to be loyal to such systems and to the sellers

which have a higher reputation (Wang, Doong, & Foxall, 2010). Online news channel and online complaint form also affect the reputation system (Park & Lee, 2007). In such forum buyers post their prior experience with a particular seller and make it public so that others can get benefitted. From the literature, it is found that better communication (Aula, 2011) and greater trust (Kim et al., 2008) lead to greater online reputation.

Incentives and Post Purchase Service

In offline shopping, the next shopping centre would be too far to travel but in online shopping the next website is just a click away. Customers can quickly switch to other websites. Due to flow of information customers are more conscious about price (Lee & Lee, 2012). Retention and make them purchase from own website is challenging. To attract customers, online shopping websites bring different kind of deals, discount coupons and offers (Dholakia, 2010). They provide some discount on Maximum Retail Price (MRP) and customers have a perception that a product is cheaper but the ground reality could be different. The price of discounted product could be more important than street price (Khedekar, 2012). Alie and Vliek (2007) invented Cash-on-Delivery. They said that face-to-face transaction creates trust between two parties and is expected to result in smooth transaction. In case of online shopping seller and buyer could not come face-to-face but the delivery man and buyer or delivery man and seller can meet directly. So delivery man is acting like a transaction stage and provides face-to-face transaction. Seller hand overs the product to the delivery man, delivery man delivers the product to the buyer, receives money from the buyer, charge his commission and then pay the seller. Cash on delivery transactions provides assurance about the purchase. Customers have nothing to lose, if they do not receive the product. Online shopping websites also provide free home delivery and this is an important tool for business growth. Some websites also provide cash back features. They pay the visitors on the basis of their time spent, products watched and product reviewed. With this cash back one can buy any products from the website. So such kind of thing seems playfulness (Cheng, 2011) gives fun to the customers and in return websites gets traffic and greater probability for sale. The return policy is another criteria, which determines post purchase (Kim & Kim, 2004). Many websites provide free pick up or pay for the return.

Based on the identifying criteria through an extensive literature review given in Table 1, definition of each criteria mentioned in Table 2 and a research framework (Figure 1), a Hierarchy Structural Model (HSM) of consumer decision making in the digital marketplace is developed. The HSM will help us to understand the relative importance of sub-criteria within the criteria and their overall impact.

Table 1
Criteria/sub-criteria with citation

Criteria/Sub-criteria	Support references
Personal Innovativeness of Information Technology (PIIT) (C_1) • Experiment (C_{11}) • Adoption of new technology (C_{12}) • Try out new information technologies (C_{13}) • Risk involved (C_{14}) • Hesitation C_{15})	Agarwal and Prasad (1998); Compeau, Higgins and Huff (1999); Hatcher (2003); Lewis, Agarwal and Sambamurthy (2003); Lu, Yu, Liu and Yao (2003); Lu et al. (2005); Lian and Lin (2008); Rogers (2010); Daim, Basoglu and Tanoglu (2010); Keisidou et al. (2011); Goh, Gao and Agarwal (2011); Xu, Luo, Carroll and Rosson (2011); Mahat, Ayub and Luan (2012); Jackson, Mun and Park (2013); Sun and Jeyaraj (2013); Martins, Oliveira and Popovič (2014); Lu (2014); Dash and Kumar (2014); Kumar and Dash (2015).
Web Quality Dimensions (C_2) • Website quality (C_{21}) • Website design (C_{22}) • Data quality (C_{23}) • Easily navigation (C_{24}) • Website responsiveness (C_{25})	Gehrke and Turban (1999); Aladwani and Palvia (2002); Yang et al. (2005); Lee and Lin (2005); Cristobal et al. (2007); Hwang and Kim (2007); Kassim and Asiah Abdullah (2010); Finn (2011); Cheng (2011); Xiao et al. (2012); Büyüközkan and Çifçi (2012); Tan, Benbasat and Cenfetelli (2013); Kumar and Dash (2013); Subramanian, Gunasekaran, Yu, Cheng and Ning (2014); Kumar and Dash (2015).
Information and E-service Dimensions (C_3) • Perceived security (C_{31}) • Perceived privacy (C_{32}) • Competitive price (C_{33}) • Third party seal (C_{34}) • Customer trust (C_{35})	Santos (2003); Constantinides (2004); Gefen and Straub (2004); Koufaris and Hampton (2004); Hsu et al. (2007); Kim et al. (2008); Udo, Bagchi and Kirs (2010); Finn (2011); Ding, Hu & Sheng (2011); Mą Sabiote, Mą Frías and Castañeda (2012); Xu et al. (2013); Subramanian et al. (2014); Kumar and Dash (2015).
Online Reputation (C_4) • Centralised reputation (C_{41}) • Trust value (C_{42}) • Seller's rating (C_{43}) • Customer relationship (C_{44}) • Social responsibility (C_{45})	Xu and Yadav (2003); Fan et al. (2005); Jøsang et al. (2007); Park and Lee (2007); Wang et al. (2010); Inversini, Marchiori, Dedekind and Cantoni (2010); Marchiori and Cantoni (2011); Aula (2011); Hung et al. (2012); Liu and Munro (2012); Portmann (2013); Rahimi and El Bakkali (2013); Diekmann, Jann, Przepiorka and Wehrli (2014); Portmann, Meier, Cudre'-Mauroux & Pedrycz (2015).
Incentives and Post Purchase Services (C_5) • Discount coupons (C_{51}) • Cash-back (C_{52}) • Free home delivery (C_{53}) • Cash on delivery (C_{54}) • Return policy (C_{55})	Punakivi and Saranen (2001); Kim and Kim (2004); Zhou (2011); Chih-Hung Wang (2012); Lee and Lee (2012); Racherla, Connolly and Christodoulidou (2013); Williams and Martinez-Perez, (2014); He, Chen and Alden (2015).

Table 2
Definition of criteria

Criteria	Definition
Personal Innovativeness of Information Technology (PIIT)	This trait characterises consumers who are conscious about their personal innovativeness about updating of information technology i.e. experiment with new information technologies, adoption of new technology, try out new information technologies, ready to risk involved during study, and hesitation and information technologies.
Web Quality Dimensions	The degree of consumer consideration about web quality dimensions provided by the internet malls i.e. web quality, web design, easily navigation, and responsiveness.
Information and E-service Dimensions	This trait characterises consumers who are conscious about their personal privacy, security, sensitivity about price, third party seal, and trustworthiness of online service provider.
Online Reputation	The degree of consumer consideration about good corporate reputation established by the internet malls i.e. centralised reputation, trust value, seller's rating, customer relationship, and social responsibility.
Incentives and Post Purchase Services	The degree of consciousness of consumer consideration about incentives and post purchase services provided by the internet malls i.e. discount coupons, cash-back, free home delivery, cash on delivery, and return policy.

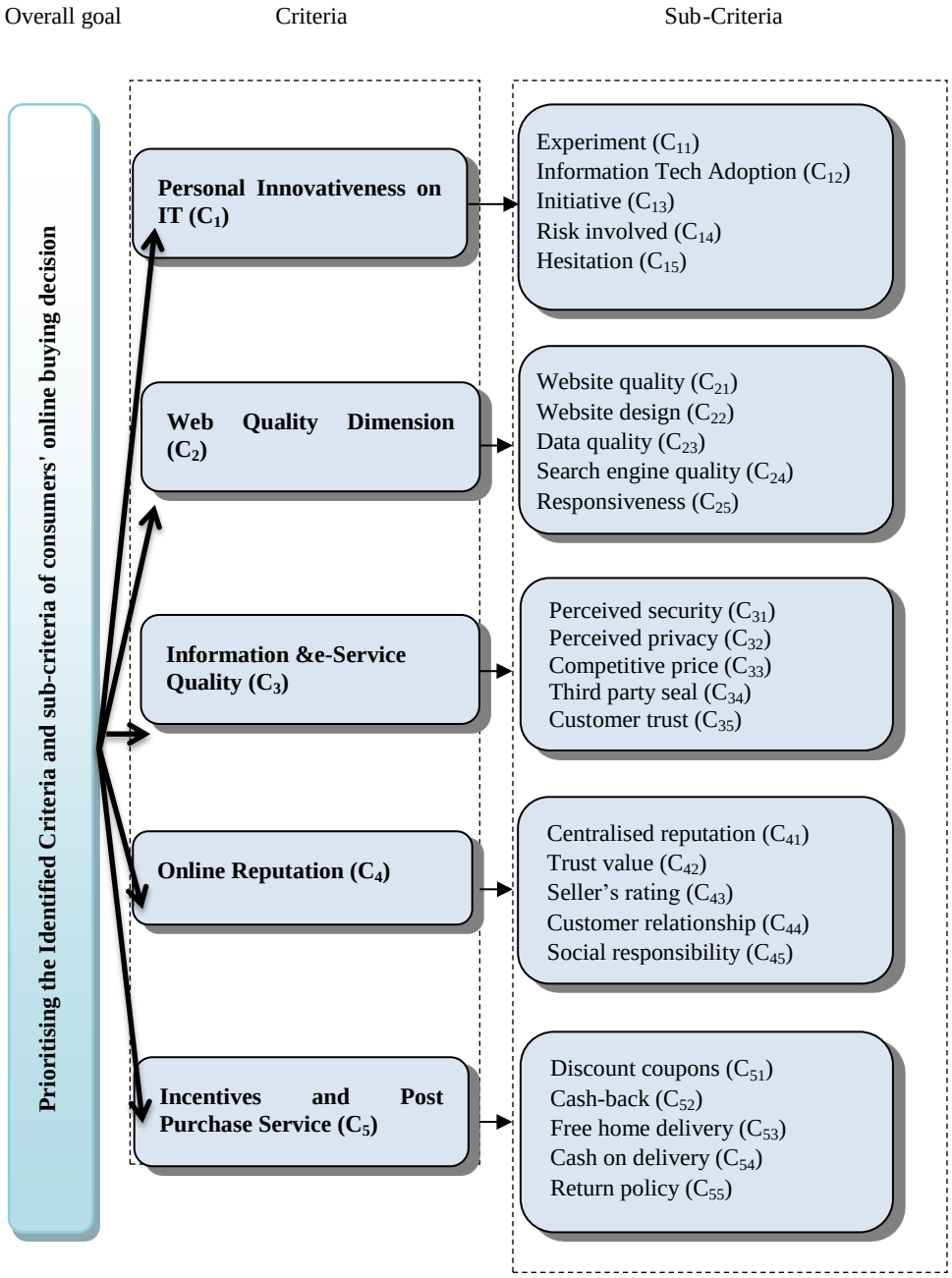

Figure 1. Research framework

DATA COLLECTION AND METHODS

Through structured questionnaire (as attached in Appendix), the data have been collected from experts personally. During personal interaction, if they have some problems understanding the concept like the objective of the study and questionnaire, the researcher helped out on the spot. First, the researchers studied the background of the experts and chose only those who have relevant experience to give proper judgement. All experts are chosen from industry as well as from academician who is working with the customer interface in the context of online channels because they know online customer well and their switching behaviour. Table 3 shows the list of experts and their expertise, experience age, gender and designation.

Table 3
List of experts and their expertise

Name	Designation	Age and Gender	Experience	Expertise
E1	Professor	38, Male	15 years	Online Marketing, Econometrics
E2	Visiting Faculty	55, Male	20 years	Internet Security, System Design
E3	Faculty	30, Female	12 years	Social Media Marketing
E4	Principal	35, Male	15 years	E-Customer Behaviour
E5	Business Analyst	36, Male	11 years	Online Reputation, Digital Marketing
E6	Soft Engineer	34, Male	10 years	Security, Designing
E6	Business Analyst	28, Male	6 years	Reputation System, Trust, e-CRM
E7	Soft Engineer	29, Male	6 years	Website Design and Security
E8	Soft Engineer	30, Male	6 years	System Engineer
E9	Business Analyst	28, Female	5 years	E-CRM, Feedback Evolution

Questionnaire had been prepared in pair wise comparison format and a scale of 1–9 has been used as mentioned in Table 4.

Table 4
Nine-points intensity scale for pair wise comparison

Relative importance	Explanation
1	Two criterion contribute equally to the objective
3	Experience and judgement slightly favour one over another
5	Experience and judgement strongly favour one over another
7	Criterion is strongly favoured and its dominance is demonstrated in practice
9	Importance of one over another affirmed on the highest possible order
2, 4, 6, 8	Used to represent compromise between the priorities listed above

Source: Satty (2000)

To analyse the data, Analytical Hierarchy Process (AHP) has been used. AHP is a mathematical tool which is used for multi-criteria decision making (Saaty, 1980; 1990; 2000; 2008). It does pair wise comparisons to measure the relative importance of the criteria in each level and/or calculate the alternatives in order to make the best decision at the lowest level of the hierarchy (Sundharam, Sharma, & Thangaiah, 2013). AHP is better than other multi-criteria techniques because it is designed to work with tangible as well as non-tangible criteria, especially if subjective judgements of different experts' contribute an important part of decision making (Saaty, 1990; 2000; 2008; Dalalah, Hayajneh, & Batieha, 2011). Figure 2 shows the hierarchy process flow chart of AHP. To prioritise the criteria and their sub-criteria which are already identified through an extensive literature review and all supportive literatures have been put in Table 1. After the development of the model, we break our objective in the hierarchy decision-making process (Viswanadhan, 2005). To collect the data a pairwise comparison questionnaire has been developed. Experts from industry and academics have been selected on the basis of their experience and research work and data have been collected through personal interview. The data have been collected and synthesised in Microsoft Excel and then analysed. Let $C = \{Cj | j = 1, 2... n\}$ be the set of decision criteria. The data of the pair wise comparison of n sub-criteria can be summarised in an $(n \times n)$ evaluation matrix A in which every element a_{ij} $(i, j = 1, 2 ... n)$ is the quotient of weights of the criteria. This pair wise comparison can be shown by a square and reciprocal matrix. In this matrix $a_{ij} = 1/a_{ji}$, for all experts, we would have $(n \times n)$ matrices.

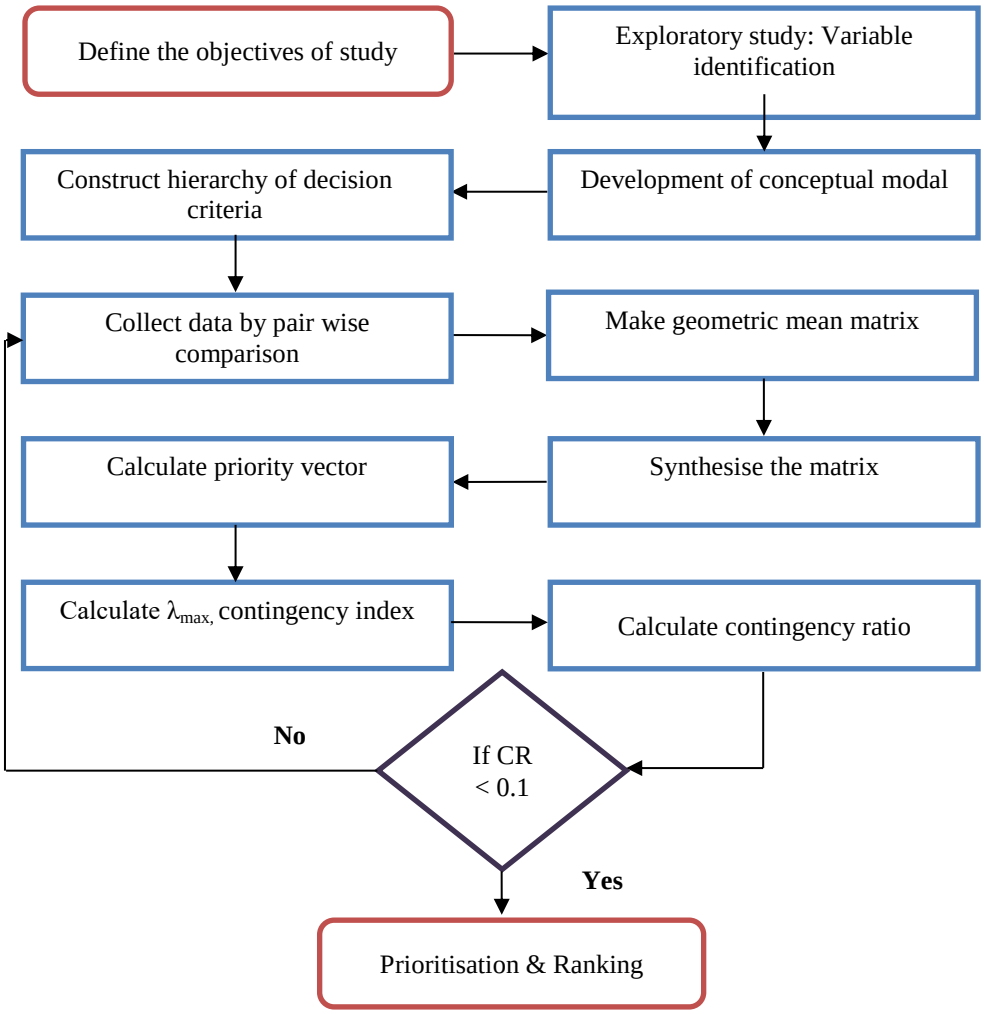

Figure 2. Calculation steps of Analytic Hierarchy Process (AHP)

Then geometric mean of all matrices has been taken to form a Geometric mean matrix (Dalalah, 2011). Though we can calculate arithmetic mean but here we are having ratio properties so we will take geometric mean (Aragon, Dalnoki-Veress, & Shiu, 2012).

$$A = (a_{ij}) = \begin{bmatrix} a_{11} & a_{12} & . & . & . & a_{1n} \\ a_{21} & a_{22} & . & . & . & a_{2n} \\ . & . & . & . & . & . \\ . & . & . & . & . & . \\ . & . & . & . & . & . \\ a_{n1} & a_{21} & . & . & . & a_{mn} \end{bmatrix} = \begin{bmatrix} 1 & a_{12} & . & . & . & a \\ 1/a_{12} & a_{22} & . & . & . & a_{2n} \\ . & . & . & . & . & . \\ . & . & . & . & . & . \\ . & . & . & . & . & a_{n-1n} \\ 1/a_{1n} & 1/a_{2n} & . & . & 1/a_{n-1n} & 1 \end{bmatrix}$$

$$G_{ij} = \left[\prod_{x=1}^{10} ax_{ij} \right]^{\frac{1}{n}} \forall i, j \qquad (1)$$

Here a_{12} represents a_{12} element of first expert matrix and so on. Now we will form a synthesised matrix, which can be derived from this formula:

$$a_{ij} = \left\{ \frac{a_{ij}}{sum\,of\;\; jth\, column} \right\} \qquad (2)$$

Now, $W = (w_1, w_2, w_3 \ldots w_n)$ is a weight of priority and are computed on the basis of Satty's eigenvector procedure.

$$w_i = \{\text{Sum of } i\text{th row} / n\} \qquad (3)$$

Satty (2000) showed the relation between evaluation matrix *A* and weight vector (Chen, 2006). The relative weights are given by the right eigenvector (ω) corresponding to the largest eigenvalue (λ_{max}), as:

$$A\omega = \lambda_{\max}\omega \qquad (4)$$

If the pairwise comparisons are completely consistent, the matrix *A* has rank 1 and $\lambda_{max} = n$. In this case, weights can be obtained by normalizing any of the rows or columns of *A* (Wang & Yang, 2007; Kumar & Dash, 2014). According to Saaty (2008), it should be noted that the quality of the output of the AHP is related to the consistency of the pairwise comparison judgements means that the validation of the result. There is numerous ways to validate but the study used eigenvalue method to check the consistency of results. The consistency is defined

by the relation between the entries of *A*: $a_{ij} \times a_{jk} = a_{ik}$ (Saaty, 2008; Kumar & Dash, 2014). To avoid the subjective judgement that will make the result inaccurately. It needs to use the consistency check to verify the rationality of the matrix (Dalalah et al., 2011). The consistency index (*CI*) can be calculated, using the following formula (Saaty, 2008):

$$CI = \left[\frac{\lambda_{\max} - n}{n-1} \right] \tag{5}$$

where λ_{max} represents the maximum variance of the matrix. We take the average of all λ and assuming it as the maximum variance possible; we calculate *CI* and *CR* and check the consistency. Using the consistency ratio (*CR*) we can conclude whether the evaluations are sufficiently consistent. The *CR* is calculated as the ratio of the *CI* and the random index (*RI*) in Table 5, as indicates in Equation (6).

Table 5
Random index

N	1	2	3	4	5	6	7	8	9	10
RI	0.00	0.00	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.45

The number 0.1 is the accepted upper limit for *CR* (Saaty, 1980; 2000; 2008). If the final consistency ratio exceeds this value, the evaluation procedure has to be repeated to improve consistency.

$$CR = \left[\frac{CI}{RI} \right] \tag{6}$$

ANALYSIS

To construct a hierarchy of customer decision model in the context of online purchasing, the criteria and sub-criteria are identified through an extensive literature review as mentioned in Table 1 then after the calculation steps of Analytic Hierarchy Process (AHP) as mentioned in flow chart Figure 2 have been followed. After collecting data from experts, Equations (1) to (5) are utilised to calculate the weight of each criteria and sub-criteria as mentioned in Table 5. To check consistency, Equation (6) has been utilised. The $CR < 0.1$ shows that there is no problem of consistency in the data set (Saaty, 1980; 1990; 2000; 2008). To check consistency for sub-criteria Equation (6) has been utilised, and value of consistency ratio is shown in Table 6.

Table 6
Prioritisation of criteria and sub-criteria

Criteria and priority (%)	Sub-criteria	Priority (%)	Rank	Consistency test	Overall rank
Personal innovativeness onIT (C_1) 13.3%	Experiment (C_{11})	.227(22.70)	2	λ_{max} = 5.3744	5
	Information technology adoption (C_{12})	.160(16.00)	5	CI = 0.0936	
	Initiative (C_{13})	.274(27.41)	1	RI = 1.12	
	Risk involved (C_{14})	.171(17.11)	3	CR = 0.083 < 0.1	
	Hesitation (C_{15})	.168(16.80)	4		
Website quality (C_2) 13.4%	Website quality (C_{21})	.132(13.21)	5	λ_{max} = 5.245	4
	Website design (C_{22})	.146(14.61)	4	CI = 0.0613	
	Data quality (C_{23})	.288(28.80)	1	RI = 1.12	
	Search engine quality (C_{24})	.178(17.81)	3	CR = 0.054 < 0.1	
	Responsiveness (C_{25})	.256(25.61)	2		
Information & e-Service quality (C_3) 34.5%	Perceived security (C_{31})	.190(19.02)	4	λ_{max} = 5.356	1
	Perceived privacy (C_{32})	.167(16.71)	5	CI = 0.089	
	Competitive price (C_{33})	.226(22.62)	1	RI = 1.12	
	Third party seal (C_{34})	.208(20.80)	2	CR = 0.0794 < 0.1	
	Customer trust (C_{35})	.207(20.70)	3		
Online reputation (C_4) 20.2%	Centralised reputation (C_{41})	.189(18.90)	3	λ_{max} = 5.365	2
	Trust value (C_{42})	.186(18.62)	5	CI = 0.0912	
	Seller's rating (C_{43})	.243(24.30)	1	RI =1.12	
	Customer relationship (C_{44})	.194(19.42)	2	CR = 0.0814 < 0.1	
	Social responsibility (C_{45})	.187(18.71)	4		
Post purchase evaluation (C_5) 18.6%	Discount coupons (C_{51})	.193(19.32)	4	λ_{max} = 5.381	3
	Cash-back (C_{52})	.162(16.23)	5	CI = 0.095	
	Free home delivery (C_{53})	.220(22.00)	2	RI = 1.12	
	Cash on delivery (C_{54})	.230(23.00)	1	CR = 0.0852 < 0.1	
	Return policy (C_{55})	.193(19.32)	3		
Overall Consistency Test: λ_{max} = 5.101, *CI* = 0.0254, *RI* = 1.12, Order (*n*) = 5, *CR* = .0227 < 0.1					

Through prioritisation each criteria and sub-criteria got the local weight, but to understand well about the priority of criteria and sub-criteria, the study is calculated integrated priority (global priority) and integrated ranking (global ranking) by multiplication of each sub-criteria weight with their main criteria weight, for instance, 0.133*0.227 = 0.0301 (integrated priority of sub-criteria (C_{11}) i.e. experiment likewise integrated priority (global priority) and integrated ranking (global ranking) have been obtained as mentioned in Table 7.

Table 7
Overall ranking of all criteria

Criteria and priority	Sub-criteria	Priority	Rank	Integrated priority	Integrated ranking
Personal innovativeness on IT (C_1) 0.133	Experiment (C_{11})	0.227	2	0.0301	18
	Information technology adoption (C_{12})	0.160	5	0.0212	23
	Initiative (C_{13})	0.274	1	0.0364	14
	Risk involved (C_{14})	0.171	3	0.0227	21
	Hesitation (C_{15})	0.168	4	0.0223	22
Website quality (C_2) 0.134	Website quality (C_{21})	0.132	5	0.0176	25
	Website design (C_{22})	0.146	4	0.0195	24
	Data quality (C_{23})	0.288	1	0.0385	10
	Search engine quality (C_{24})	0.178	3	0.0238	20
	Responsiveness (C_{25})	0.256	2	0.0343	17
Information and e-service quality (C_3) 0.345	Perceived security (C_{31})	0.190	4	0.0655	4
	Perceived privacy (C_{32})	0.167	5	0.0576	5
	Competitive price (C_{33})	0.226	1	0.0779	1
	Third party seal (C_{34})	0.208	2	0.0717	2
	Customer trust (C_{35})	0.207	3	0.0714	3
Online reputation (C_4) 0.202	Centralised reputation (C_{41})	0.189	3	0.0381	11
	Trust value (C_{42})	0.186	5	0.0375	13
	Seller's rating (C_{43})	0.243	1	0.0490	6
	Customer relationship (C_{44})	0.194	2	0.0391	9
	Social responsibility (C_{45})	0.187	4	0.0377	12
Post purchase evaluation (C_5) 0.186	Discount coupons (C_{51})	0.193	4	0.0358	15
	Cash-back (C_{52})	0.162	5	0.0301	19
	Free home delivery (C_{53})	0.220	2	0.0409	8
	Cash on delivery (C_{54})	0.230	1	0.0427	7
	Return policy (C_{55})	0.193	3	0.0358	16

In the analysis, "information and e-service quality" is the most important criteria with weight 34.5% followed by "online reputation" with 20.2%. Sub-criteria of "information and e-service quality, competitive price" (22.6%) is the first priority followed by third party seal (20.8%). This criteria analysis shows that customers are more conscious about information and service quality provided by online service providers which are related to price, third seal, privacy, security and trust. The analysis critically shows that during online purchasing customer is much concerned about price.

The criteria "online reputation" is the second most priority among all with weight of 20.2%. Online reputation is a degree of consumer consideration of good corporate reputation established by the internet malls i.e. centralised reputation, trust value, seller's rating, customer relationship, and social responsibility. In the sub-criterion "sellers' rating" with 24.30% weight is the first priority followed by "customer relationship" with 19.42%. It shows that customers check the sellers' rating, CRM policies and reputation system. With 18.6% weight to the criteria "post purchase evaluation" is the third priority. After taking the decision to purchase, customers are attracted by cash on delivery (23%), discount (19.3%) and home delivery (22%). Customers also want to be aware of the return policy. Easy return policy helps customers to make the purchase.

A website can earn reputation through a smooth transaction and honest business policy if the service providers focus on it because with 13.4% weight, website quality has the fourth position in the analysis. Due to the overflow of information one can easily find what he is looking for from different sources. Sometimes customers visit the product and raise some query. The response time (25.6%) of the website can impress the customers. Other criteria like website quality, design, and search engine are more or less equally important criteria.

"Personal innovativeness with information technology (PIIT)" is the least important criteria among others with 13.3% weight. The sub-criteria of PIIT, the "initiative" (27.4%) is one of the most influencing sub-criteria followed by "experiment" with 22.7%. People want to be the first one among the peer group. They wish to be the first to use the new technology or product. People also want to experiment with the latest technology as they become conscious through social media or newspapers. But it is less likely that people, who are coming forward to use or purchase the product, would definitely adopt (16%) it. They will check the characteristics of the product first before they decided whether to use it or not. Sometimes people hesitate (16.8%) to use the technology; they might become shy to have a newly launched product. It may be due to lifestyle, fashion or income. In case of website quality, data quality is the most important criteria.

Table 7 shows the overall ranking means integrated priority (global priority) and integrated ranking (global ranking). The result shows that competitive price is the most influencing sub-criteria. Information security, a third party seal, privacy, trust, seller's rating, free home delivery and cash on delivery are among the primary criteria. Customers also expect better information quality, reputation system, discounts, easy return policy and quick response.

THEORETICAL AND PRACTICAL IMPLICATIONS

The finding of this study can have several theoretically and practically implications. Theoretically, the study identified new criteria/sub-criteria and constructed a Hierarchy Structural Model (HSM) of consumers' buying decision making in the context of online market as mentioned in Figure 3.

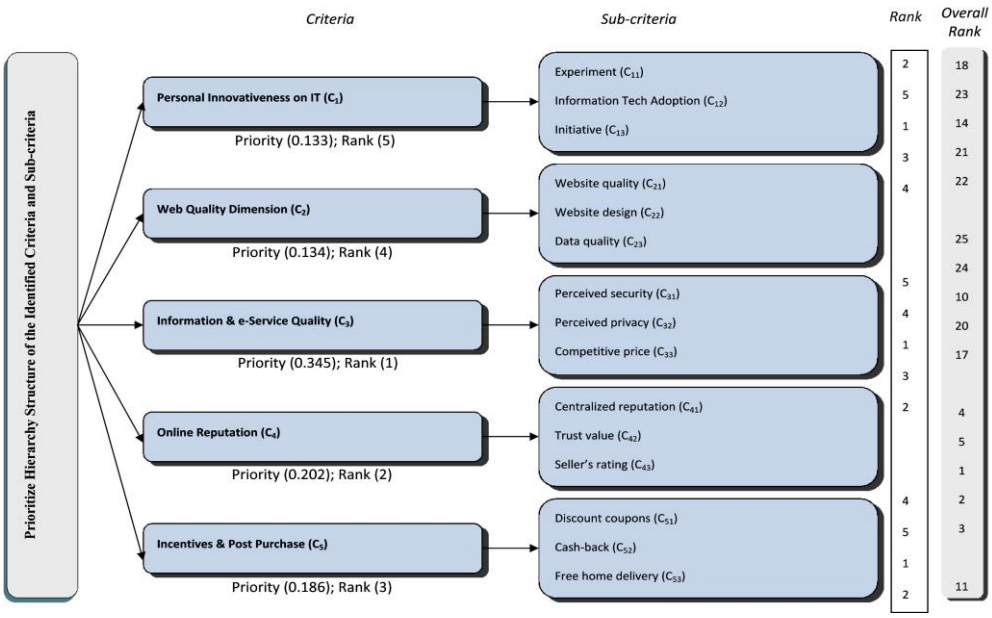

Figure 3. Hierarchy Structure Model (HSM) of identified criteria

From a practical perspective, online shopping malls can identify the most influencing criteria and can enhance their quality. One of the most important results is that website owners should pay more attention to provide competitive price, information security and privacy, which could lead to greater trust hence, can enhance online reputation. Second, if a website is selling products from different sellers then there should be a proper third party seal. With the third party seal, customers need to be more comfortable. Finally providing discount coupons, quick response, easy return policy, free home delivery and cash on delivery always fascinate customer's purchase decision. The study also suggests that online shopping malls need to pay great attention towards information and e-service dimension; online reputation and incentives to deliver more value to the customers.

CONCLUSION AND RECOMMENDATIONS

In this digital era, one needs to realise the importance of every element which could affect the customer's online purchase decision. In case of online purchasing, customers and sellers neither interacts face to face nor do customers see the actual condition of the product. For the time being, number of studies has been conducted by researchers to find the influencing factors of their decision during online purchasing but less discussion available in literature to understand their priority. The study fulfills the gap and enriches the existing literature concerning online purchase decision-making. The study also studies about information related issue, website dimension and incentives which influence customers' decision-making.

This study examined the different criteria and sub-criteria to understand customers' needs, perception and priority of criteria with the help of Analytical Hierarchy Process (AHP). The five identified criteria are analysed on the basis of experts' judgement and experience and priority of criteria is struck out. On the basis of priority, a hierarchy of customer decision model HSM is constructed. However, due to availability of information, customers are more price-conscious. They can check the price from various sources and can find the cheapest one that is reasonable perceived price value, perceived security and perceived privacy is always highly expected to build trust and reputation among customers. The study also shows that compare to reputation and website quality dimension, e-service dimension is the most important criteria. The e-service quality may be rapidly improved with implication of advanced technology where reputation can be improved by overall satisfaction of consumers. The study also suggests that online shopping malls need to pay great attention towards information and e-service dimension; online reputation and incentives to deliver more value to the customers. The hierarchy structure model tells only the priority of criteria/sub-criteria but not of interrelationship within criteria and sub-criteria. To find the interrelationship i.e. cause and effect relationship within criteria and sub-criteria, the future research can be conducted.

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APPENDIX

Table A1
Sample question from questionnaire (Pair wise comparison of criteria)

Importance of one perspective over another	**Main Perspectives**	Scale	Web Quality	Information & e-service quality	Online Reputation	Incentives & Post Purchase Services	Information & e-service quality	Online Reputation	Incentives & Post Purchase Services	Online Reputation	Incentives & Post Purchase Services	Incentives & Post Purchase Services
	Absolute	9										
	Very Strong	7	**A**									
	Strong	5										
	Moderate	3										
	Equal	1										
	Moderate	3										
	Strong	5						**B**				
	Very strong	7										
	Absolute	9										
	Main Perspectives	Scale	Personal Innovativeness of IT	Personal Innovativeness of IT	Personal Innovativeness of IT	Personal Innovativeness of IT (PIIT)	Web Quality	Web Quality	Web Quality	Information & e-service quality	Information & e-service quality	Online Reputation

Notes: All five criteria are put along with the other four. If someone according to his experience, expertise and perception finds "Web quality" more important than PIIT, then he will use "Upper" scale to give score. In the above example he finds that "Web quality" is 7 very stronger than PIIT so he ticks upper "7" but he also finds 'Web quality' stronger than "Online reputation". Now he would use lower scale.

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