A Study on Impact of Online Shopping on Direct System in India and the Road Ahead: AN INTERPRETIVE STRUCTURAL MODELING APPROACH

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Abstract

Purpose: *The average annual spending of Indians on online purchases is expected to rise 67 percent to Rs. 10,000 next year, according to a study. Currently, online shoppers spend around Rs. 6,000 a year on average, said the Assocham-PwC study. About 40 million consumers purchased something online this year and the number is expected to grow to 65 million by the end of this year with better infrastructure in terms of logistics, broadband and Internet- ready devices. The Internet and World Wide Web have made it easier, simpler, cheaper and more accessible for businesses and consumers to interact and conduct commercial transactions electronically. This is practically the case when online shopping (i.e. Internet shopping) is compared to the traditional approach of visiting a retail store.*

Design/Methodology/Approach: *Descriptive research has been applied, describes data and characteristics about the population or phenomenon being studied. The researchers have used primary data through self-constructed structured Questionnaire and as far as the secondary data is concerned that was obtained from web sites, journals etc. Structured questionnaire was constructed to interview the respondents doing online purchases on 36 different parameters on Likert's seven-point scale, which was later reduced to factors by using the statistical technique of factor analysis. Interpretative Structural Modeling is a process in which a set of interlinked elements are given a form of a comprehensive and a systematic model. This technique helps in formulating the inter-relationship among the identified variables.*

Findings: *This research offers some insights into the linkage between e-shopping and customers' decisions to shop or not shop online. This information can help online marketers and retailers to develop appropriate market strategies, make technological advancements, and make the correct marketing decisions in order to retain current customers and attract new customers. Specifically, if online marketers and retailers can better understand their customers, they can present goods and services more effectively and continuously to improve their offerings in order to strengthen their competitive advantage.*

Research Limitations/Implications: *The study focuses on general problems faced by online marketers compared to traditional marketers. There might be certain more variables as one person is satisfied on particular aspect but another may not on the same aspect. Here the framework developed depends upon the opinion of few experts and has some element of bias. Through ISM, a relationship model among behavioral intent variables has been developed. This model has not been statistically validated. Structural equation modeling (SEM) has the capability of testing the validity of the model.*

Interpretive Structural Model, Online Shopping, Online Shopping and its adoption, Online Shopping, Organizational Sustainability, and media.

INTRODUCTION

Online shopping in India is an emerging trend for marketers to promote their merchandise in wide geographical area using internet and the trend looks likely to grow upwards over the coming decade. India is the 5th country in world ecommerce and 2nd country in Asia. India seems to have grasped the ability to shop merchandise through internet. Mobile internet is being enormously responsible for opening up the online world to Indian consumers. The average annual spending of Indians on online purchases is expected to rise 67 percent to Rs. 10,000 next year, according to a study. Currently, online shoppers spend around Rs. 6,000 a year on average, said the Assocham-PwC study. About 40 million consumers purchased something online this year and the number is expected to grow to 65 million by the end of this year with better infrastructure in terms of logistics, broadband and Internet-ready devices. The Internet and World Wide Web have made it easier, simpler, cheaper and more accessible for businesses and consumers to interact and conduct commercial transactions electronically. This is practically the case when online shopping (i.e. Internet shopping) is compared to the traditional approach of visiting retail stores **(McGaughey & Mason, 1998).** Consumer optimism in India has seen a sharp turnaround and the country has been ranked first among nine nations surveyed by Credit Suisse, thanks to a stable government and easing inflationary pressures. According to the Credit Suisse Emerging Consumer Scorecard 2015, India topped the chart, moving up from fourth in last year's list. India was followed by Brazil and Indonesia. "Consumer optimism has seen a sharp turnaround in 2014. **Alibaba and Tencent** spent more than $8 billion last year alone backing often strikingly similar ventures, as the Chinese Internet giants race to create online one-stop-shops to win the digital loyalty of a tenth of the world's population. **Monsuwe, Dellaert, and Ruyter (2004)** suggest five reasons that drive consumers to shop online. Firstly, consumers can use minimal time and effort to browse an entire product assortment by shopping online. Secondly, consumers can gain important information about companies, products and brands efficiently by using the Internet to help them make purchase decisions more accurately. Thirdly, when compared to traditional retail shopping, online shopping enables consumers to compare product features, price, and availability more efficiently and effectively. Fourthly, online shopping allows consumers to maintain their privacy when they buy sensitive products. Finally, online shopping can reduce consumers' shopping time, especially for those consumers whose times are perceived to be costly when they do brick-and-mortar shopping **(Monsuwe et al., 2004).**

E COMMERCE INDUSTRY IN INDIA

Recent years have seen a remarkable transformation in the way India shops and trades. E-commerce has taken the world of retail by storm and captivated the imagination of an entire generation of entrepreneurs, with e-commerce ventures with various business and commercial models. The explosive growth in the last few years has already catapulted the biggest firms among these ventures past the billion-dollar territory. The sector has grown three times in four years to nearly 12.6 billion USD in 2013. Various industry estimates project that the sector will further growth five to seven times over the next four to five years. Over the last two decades, rising internet and mobile phone penetration has changed the way we communicate and do business. E-commerce is relatively a novel concept. It is, at present, heavily leaning on the internet and mobile phone revolution to fundamentally alter the way businesses reach their customers. Continuing on the strong growth momentum of 2014, the e-commerce industry is estimated to see a 67 per cent increase in the average annual spending on online purchases per individual in 2015, to Rs 10,000 from Rs 6,000 in 2014, the study said. “E-commerce in India is a $11 billion market, and is estimated to reach $20 billion by 2015, growing at a CAGR (compound annual growth rate) of 37% over 2013-15,” Motilal Oswal Securities said in its report on e-commerce. The research firm said there are multiple enablers for this growth which include an increase in the number of Internet users and an increased proportion of online shoppers within those users, growth in the per-shopper transaction value and continued flow of capital by willing investors.

Ecommerce industry, which started flourishing in India nearly ten years back with eBay acquiring Avnish Bajaj owned Baazee.com, an online auction portal, has come a long way indeed. It is, at present, one of the fastest growing sectors of the Indian digital economy. The **e Commerce industry in the India** which grew by 33% last year and saw goods and services worth $3.5 billion exchanging hands is poised for bigger growth and touch new highs. Gartner predicts a 70% growth rate for the sector and expects $6 billion worth of business in 2015.

IDENTIFICATION OF VARIABLES

Davis et al. (1989) explained next to identifying the steps of the buying process and the potential role of marketing in each stage, marketers are eager to comprehend how purchasing choices and decisions are made, how consumers are likely to react to innovation and how to predict the outcome of the customer vendor interaction. **Donthu and Garcia (1999)** Proposed that risk aversion, innovativeness, brand consciousness, price consciousness, importance of convenience, variety-seeking propensity, impulsiveness, attitude toward adverting, attitude toward shopping, and attitude toward direct marketing would influence online shopping behavior. **Bhatnagar, Misra and Rao (2000)** measured how demographics, vender/service/ product characteristics, and website quality influence the consumers, their attitude towards online shopping and consequently their online buying behavior. They report that the convenience the Internet affords and the risk perceived by the consumers are related to the two dependent variables (attitudes and behavior) positively and negatively, respectively. **Hoffman and Novak (2000)** explained that consumers who experience the flow state in a hypermedia CME exhibit exploratory behaviors (e.g., shopping behavior) than those who do not. **Rowley (2000)** studied that the financial risks had been cited as a main reason to stop internet shopping and security had become a major concern both in online transaction relationships. **Heijden, Verhagen, and Creemers (2001)** stated that online purchase intention at the website is strongly determined by attitude towards online shopping at the website. Also, trust-oriented models appear to be more appropriate to explain online purchase intention than website-oriented models. **Lee and Turban (2001)** indicated that merchant integrity is a major positive determinant of consumer trust in Internet shopping, and that its effect is moderated by the individual consumer's trust propensity. Sofres (2002) explained that given the continuous expansion of the Internet in terms of user numbers, transaction volumes and business penetration this massive research endeavor is not surprising. More than 20 per cent of Internet users in several countries already buy products and services online while more than 50 per cent of US net users regularly buying online. **Lee (2002)** explained that internet meltdown at the end of the 1990s and plenty of more recent anecdotal and empirical evidence indicate that many online firms still do not completely understand the needs and behavior of the online consumer while many of them continue to struggle with how effectively to market and sell products online. **Lee & Johnson (2002)** explained that intention will predict actual behavior is somewhat

suspect based on the large numbers of dropouts or those who note they are only browsing while online. **Suki and Suki (2009)** conducted a study on 'Cellular Phone Users' Willingness to Shop Online'. The study suggested that marketers should propose more on attractive promotion such as advertisements or discounts through the web. **Chowdhury and** Ahmad (2011) conducted a study on 'factors affecting consumer participation in online shopping in Malaysia'. The major focus of the study was to describe the relationship between independent variables and dependent variable using Pearson's correlation method.

OBJECTIVES OF STUDY

The broad objectives of study are

- To identify the various factors affecting the adoption of online shopping that impact organizational sustainability in Delhi and NCR.
- To establish a relationship between various factors affecting online shopping and its adoption by the customers.
- To present the complex relationship among these factors in the form of an Interpretive Structural Model.

RESEARCH METHODOLOGY

Exploratory research has been applied, describes data and characteristics about the population or phenomenon being studied. The researchers have used primary data through self-constructed structured Questionnaire and as far as the secondary data is concerned that was obtained from web sites, journals etc. Structured questionnaire was constructed to interview the respondents doing online purchases on 38 different parameters on Likert's seven-point scale, which was later reduced to limited dimensions by using the statistical technique of factor analysis and further the factors were tested by ISM technique done with the help of expert opinions. Interpretative Structural Modeling is a process in which a set of interlinked elements are given a form of a comprehensive and a systematic model **(Agarwal, Shankar, & Tiwari, 2007)**.

This technique helps in formulating the inter-relationship among the identified variables. The model formulated with the help of ISM depicts the structure or a system of a complex issue in graphical and a flowchart form. The technique is basically based on the interpretations of experts and the group who are the decision makers of how and why the variables are inter-related. An

integrated and overall structure is extracted out of these inter-relationships. In this research, ISM is applied to present a framework for modeling the factors affecting the buying intentions of customers in the telecom industry on the basis of market mix and service quality. Various steps involved in the ISM technique are illustrated (Agarwal, Shankar, & Tiwari, 2007).

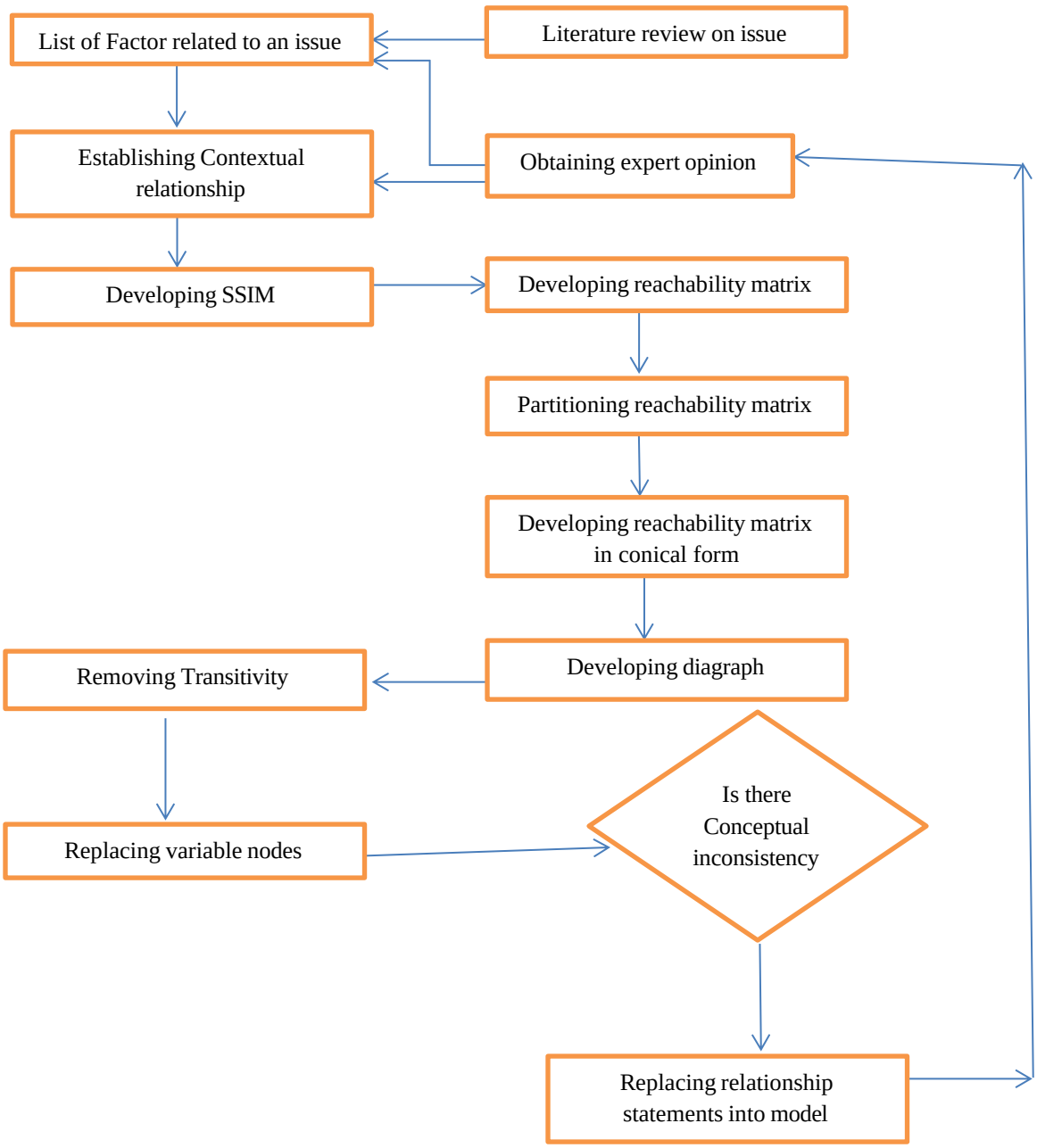

Fig. 1: Proposed ISM Model

Research Design

The research design is explorative cum descriptive in nature. In order to collate the responses, 7-point Likert's scale from strongly agree to strongly disagree is employed. Exploratory factor analysis was used to identify the factors that influence consumers' decisions to adopt online shopping, which in turn, satisfied the first research objective. This study is restricted to the respondents of NCR who preferred to do online shopping. The importance of this study is that it focuses on investigating the impact of various factors on the adoption of online shopping.

Sources of Data

To cater the need of the research, the researchers have used primary data and expert opinion through self-constructed structured Questionnaire to explore the significance of various factors of online shopping adoption.

Data Collection Technique

Primary data were collected from customers shopping in various malls of Delhi and NCR. There were 428 respondents from various places in Delhi and NCR used for this study. Structured questionnaire was constructed to interview the respondents of NCR doing online shopping on various platforms. The responses of the respondents are measured on Likert's seven point scale (ranging from strongly agree to strongly disagree).

Sampling Technique

As far as the sampling technique is concerned, purposive sampling is used to collect data.

Statistical Tools Used

IBM SPSS 20 (Statistical Package for the Social Sciences), for data analysis and for the reduction of factors the factor analysis is done using Rotated component matrix and for the reliability the Cronbach's alpha was calculated and sample adequacy was tested on KMO and Bartlett's Test.

DATA ANALYSIS AND INTERPRETATION

Reliability Analysis

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No. of Items
0.864	0.853	36

Table 1: Reliability Statistics

In order to check the reliability of the questionnaire, the Cronbach's Alpha test was applied. The value of Cronbach's alpha is found to be 0.864. As the value of Cronbach's Alpha is more than 0.6, which considers the data to be reliable for hypothesis testing.

Validity Analysis

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.852
Bartlett's Test of Sphericity	Approx. Chi-Square	6349.232
	Df	630
	Sig.	0.000

Table 2: KMO and Barlett's Test

From table 2, it is found that the value for Kaiser-Meyer-Olkin Measure of Sampling Adequacy was more than 0.6, and it is 0.748 also Bartlett's Test of Sphericity has significant value less than 0.05 at 5% level of significance. So factor analysis was conducted successfully for data reduction.

FACTOR ANALYSIS

The results of statistical assumption tests revealed that the data set was appropriate for factor analysis. Thus, principal component factor analysis was conducted on all of the items that were identified from the literature review. Rotated Component Matrix is given below: -

	1	2	3	4	5	6	7	8	9	10	11
My Contact Details and Information kept secret by Retailer	0.752										
Online Purchases are of low risk.	0.782										
My bank card detail and online payment detail are safe.	0.731										
It gives sense of confidence in me that my details are kept secret by retailer.	0.724										
In terms of security online shopping can be comparable with the traditional shopping.	0.629										
Regular and continuous access to internet		0.841									
Regular and continuous access to computer		0.863									
Skill level in using Internet		0.725									
Awareness about process of making		0.671									

online purchase											
The design of website of retailer is attractive			0.862								
Easy to access and complete transaction through retailer website			0.881								
Flexible links are available on the website of retailer to move back and forth			0.552								
Navigation of retailer's website is easy			0.620								
Website contain in depth information to solve queries of customers			0.719								
Online purchases help to reduce transportation cost				0.847							
Online purchases help to buy similar products at cheaper prices				0.519							
Online purchases is better value for money				0.723							
Internet offers comparatively low prices than the traditional retailers				0.838							
Online Retailers encourages for feedback and suggestions					0.521						

Online Retailers understand the needs of the customers					0.838						
After sales services are easily provided by online retailers					0.619						
Internet retailers provide personalized customer service to the buyers					0.730						
Less time and efforts in making online purchases						0.581					
Online purchases saves time so that other activities can be done during that time						0.883					
Online purchases are more convenient than the traditional purchases						0.739					
The product received on delivery is similar in quantity and quality as per commitment of online retailer							0.553				
Product Guarantee is honored by online retailers							0.771				
Delivery time is as per promised time							0.842				

Wide Variety of products are available on the internet								0.927			
I always purchase the types of products I want from the Internet.								0.620			
I can buy the products that are not available in retail shops through the Internet								0.881			
Content is clearly understood									0.772		
Content on website is sufficient									0.821		
Information available on website is qualitative										0.641	
Information available on website is reliable										0.881	
Adoption of Online Shopping											0.773

Table 3: Factor Analysis

From the table 3, the 36 variables are condensed to eleven factors viz.

Factor 1: This factor explains the first component and is designated as ***"Security".*** **(S)**

Factor 2: This factor explains the second component and is designated as ***"Customer accessibility".*** **(CA)**

Factor 3: This factor explains the third component and is designated as ***"Website Contents".*** **(WC)**

Factor 4: This factor explains the fourth component and is designated as ***"Cost to Customer".*** **(CC)**

Factor 5: This factor explains the Fifth component and is designated as ***"Quality of Service".*** **(QS)**

Factor 6: This factor explains the Sixth component and is designated as ***"Accessibility".*** **(A)**

Factor 7: This factor explains the Seventh component and is designated as ***"Guarantee and Warranty".*** **(GW)**

Factor 8: This factor explains the Eighth component and is designated as ***"Product Variety".*** **(PV)**

Factor 9: This factor explains the Ninth component and is designated as ***"Content Available on Website".*** **(CW)**

Factor 10: This factor explains the Tenth component and is designated as ***"Quality and Reliability of Information available on website".*** **(QR)**

Factor 11: This factor explains the Eleventh component and is designated as ***"Adoption of Online Shopping"*** **(AO).**

HYPOTHESES OF STUDY

The following Hypotheses were formulated as follows: -

H_O represents Null Hypothesis.

H_O1: There is no significant relationship between well designed website contents and adoption of online shopping.

H_O2: There is no significant relationship between security and adoption of online shopping.

H_O3: There is no significant relationship between service quality and adoption of online shopping.

H_O4: There is no significant relationship between cost to customer and adoption of online shopping.

H_O5: There is no significant relationship between product variety and adoption of online shopping.

H_O6: There is no significant relationship between accessibility and adoption of online shopping.

H_O7: There is no significant relationship between product guarantee and adoption of online shopping.

H_O8: There is no significant relationship between convenience and adoption of online shopping.

H_O9: There is no significant relationship between content available on website and adoption of online shopping.

H_O10: There is no significant relationship between quality and reliability of information available on website and adoption of online shopping.

PROPOSED THEORETICAL RESEARCH MODEL

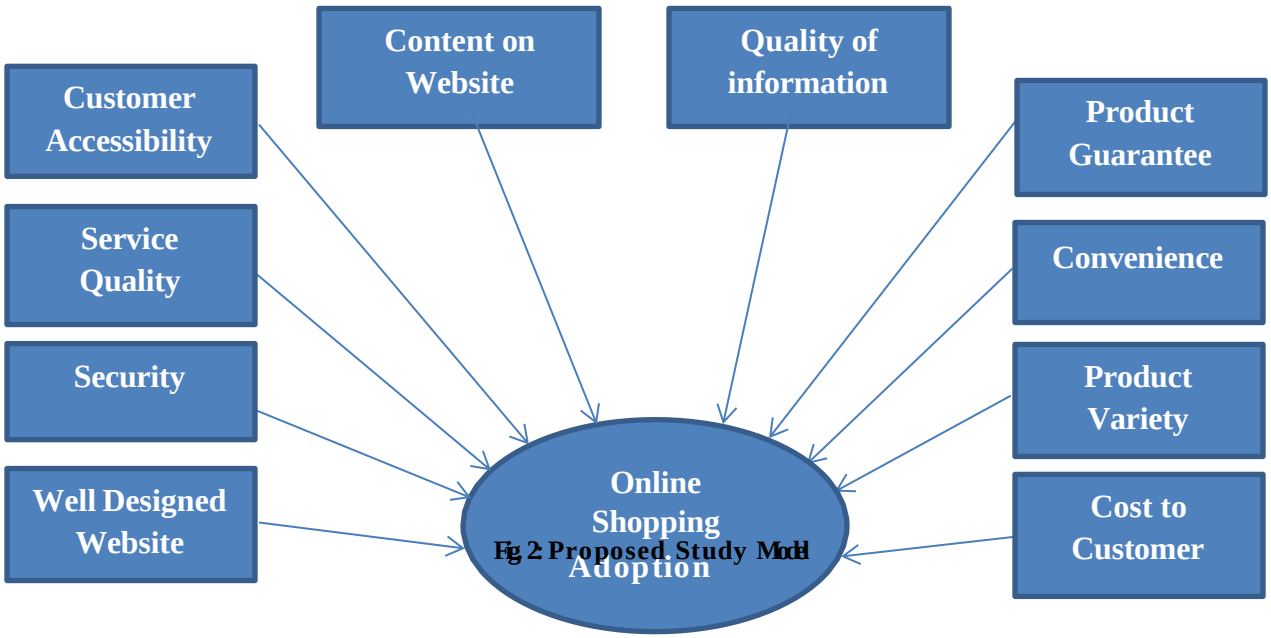

Fig 2: Proposed Study Model

COEFFICIENTS OF CORRELATION

		S	CA	WC	CC	QS	A	GW	PV	CW	QR	AO
R	AO	0.661	0.724	0.882	0.416	0.821	0.625	0.885	0.914	0.226	0.726	1
Sig		**0.000***	**0.000***	**0.000***	**0.000***	**0.000***	**0.000***	**0.000***	**0.000***	**0.000***	**0.000***	--
R	QR	0.628	0.001	0.548	-0.614	0.774	-0.771	0.826	0.004	0.638	1	0.726
Sig		**0.000***	0.927	**0.000***	0.995	**0.000***	1.336	**0.000***	0.416	**0.000***	--	**0.000***
R	CW	-0.181	-0.417	0.682	0.772	0.005	0.115	0.005	0.241	1	0.638	0.226

Sig		0.264	2.512	**0.000***	**0.000***	0.842	0.825	0.117	0.061	--	**0.000***	**0.000***
R	PV	0.117	0.172	0.771	0.031	0.007	-0.025	-0.162	1	0.241	0.004	0.914
Sig		0.092	0.071	**0.000***	0.981	0.417	1.336	0.071	--	0.061	0.416	**0.000***
R	GW	0.881	0.226	0.638	0.528	0.481	0.002	1	-0.162	0.005	0.826	0.885
Sig		**0.000***	0.218	**0.000***	**0.000***	**0.000***	0.317	--	0.071	0.117	**0.000***	**0.000***
R	A	0.581	0.615	-0.551	0.691	0.724	1	0.002	-0.025	0.115	-0.771	0.625
Sig		**0.000***	**0.000***	1.216	**0.000***	**0.000***	--	0.317	1.336	0.825	1.336	**0.000***
R	QS	0.484	0.774	0.885	0.489	1	0.724	0.481	0.007	0.005	0.774	0.821
Sig		**0.000***	**0.000***	**0.000***	**0.000***	--	**0.000***	**0.000***	0.417	0.842	**0.000***	**0.000***
R	CC	0.746	-0.331	0.338	1	0.489	0.691	0.528	0.031	0.772	-0.614	0.416
Sig		**0.000***	0.826	0.081	--	**0.000***	**0.000***	**0.000***	0.981	**0.000***	0.995	**0.000***
R	WC	0.732	0.001	1	0.338	0.885	-0.551	0.638	0.771	0.682	0.548	0.882
Sig		**0.000***	0.925	--	0.081	**0.000***	1.216	**0.000***	**0.000***	**0.000***	**0.000***	**0.000***
R	CA	0.661	1	0.001	-0.331	0.774	0.615	0.226	0.172	-0.417	0.001	0.724
Sig		**0.000***	--	0.925	0.826	**0.000***	**0.000***	0.218	0.071	2.512	0.927	**0.000***
R	S	1	0.661	0.732	0.746	0.484	0.581	0.881	0.117	-0.181	0.628	0.661
Sig		--	**0.000***	**0.000***	**0.000***	**0.000***	**0.000***	**0.000***	0.092	0.264	**0.000***	**0.000***

Table 4: Karl Pearson Coefficient of Correlation

Structural Self-Interaction Matrix (SSIM)

The factors for modeling the factors affecting adoption of online shopping that impact organizational sustainability are coded as Security (1), Customer Accessibility (2), Website Content (3), Cost To Customer (4), Quality Of Service (5), Accessibility To Website (6), Guarantee & Warranty (7), Variety Of Product (8), Content On Website About Product (9), Quality & Reliability Of Product (10), Adoption Of Online Shopping (11). For the analysis of these variables, the contextual relationship of affect is chosen which means that one variable affects the other in one way or the other. Further, since there is a contextual relationship existing between two variables (i and j), the direction of their association is determined.

Four symbols are used to determine the type of relation that exists between two variables that are considered:

V— variable i affects variable j; A— variable j affects variable i; X— variables i and j affect each other; O— variables j and i are unrelated.

Based on these, an SSIM is prepared which is shown in Table 5 below:

ELEMENT	11	10	9	8	7	6	5	4	3	2
1	V	V	O	O	A	X	V	V	V	V
2	V	O	O	O	O	A	V	O	O	
3	V	V	A	A	A	O	V	O		
4	V	O	A	O	A	A	X			
5	V	V	O	O	A	A				
6	V	O	O	O	O					
7	V	V	O	O						
8	V	O	O							
9	V	V								
10	V									

Table 5: Structural self-interaction matrix

Reachability Matrix

The SSIM table is now transformed into a reachability matrix by converting the value in each cell in '0's and 1's based on the following situations: 1.If (i,j) entry is V, then (i,j) in reachability matrix becomes 1 and (j,i) entries is 0. 2. If (i,j) entry is A, then (i,j) in reachability matrix becomes 0 and (j,i) entries is 1. 3. If (i,j) entry is X, then (i,j) in reachability matrix becomes 1 and (j,i) entries is 1. 4. If (i,j) entry is O, then (i,j) in reachability matrix becomes 0 and (j,i) entries is 0.

ELEMENT	1	2	3	4	5	6	7	8	9	10	11
1	1	1	1	1	1	1	0	0	0	1	1
2	0	1	0	0	1	0	0	0	0	0	1

3	0	0	1	0	1	0	0	0	0	1	1
4	0	0	0	1	1	0	0	0	0	0	1
5	0	0	0	1	1	0	0	0	0	1	1
6	1	1	0	1	1	1	0	0	0	0	1
7	1	0	1	0	0	0	1	0	0	1	1
8	0	0	1	0	0	0	0	1	0	0	1
9	0	0	1	1	0	0	0	0	1	1	1
10	0	1	0	1	0	1	0	1	0	1	1
11	0	0	0	0	0	0	0	0	0	0	1

Table 6: Initial Reachability Matrix

Further, '1*' is incorporated depicting transitivity which aims to fill in any gap in the opinion that is collected during the brainstorming sessions. **Table 7** shows the final reachability matrix.

ELEMENT	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
1	1	1	1	1	1	1	1*	1*	0	1	1
2	0	1	0	1*	1	1*	0	1*	0	1*	1
3	0	0	1	1*	1	1*	1*	1*	1*	1	1
4	0	0	0	1	1	1*	0	1*	0	1*	1
5	0	0	0	1	1	1*	0	1*	0	1	1
6	1	1	1*	1	1	1	1*	1*	0	1*	1
7	1	0	1	1*	0	0	1	0	0	1	1
8	0	0	1	1*	0	0	0	1	0	1*	1
9	0	0	1	1	0	1*	0	1*	1	1	1
10	0	1	0	1	0	1	0	1	0	1	1
11	0	0	0	0	0	0	0	0	0	0	1

Table 7: Final Reachability Matrix

Partitioning the reachability matrix

The reachability matrix is partitioned with the help of identification of antecedent and reachability sets for every variable. The reachability set consists of element which directly affects whereas antecedent set consists of elements which may be affected. Then the intersection set is derived from these sets for all the elements. The elements for which the reachability set and intersection set are same act as the top level elements in ISM model.

Once these are found, they are separated. This process is repeated until all the iterations are complete and all intersections are obtained. All the iterations for this procedure are shown below.

ELEMENT	REACHABILITY SET (Pi)	ANTECEDENT SET (Pj)	INTERSECTION	LEVEL
1	1,2,3,4,5,6,7,8,10,11	1,6,7	1,6,7	
2	2,4,5,6,8,10,11	1,2,6,10	2,6,10	
3	3,4,5,6,7,8,9,10,11	1,3,6,7,8,9	3,6,7,8,9	
4	4,5,6,8,10,11	1,2,3,4,5,6,7,8,9,10	4,5,6,8,10	
5	4,5,6,8,10,11	1,2,3,4,5,6	4,5,6	
6	1,2,3,4,5,6,7,8,10,11	1,2,3,4,5,6,9,10	1,2,3,4,5,6,10	
7	1,3,4,7,10,11	1,3,6,7	1,3,7	
8	3,4,8,10,11	1,2,3,4,5,6,8,9,10	3,4,8,10	
9	3,4,6,8,9,10,11	3,9	3,9	
10	2,4,6,8,10,11	1,2,3,4,5,6,7,8,9,10	2,4,6,8,10	
11	11	1,2,3,4,5,6,7,8,9,10,11	11	**I**

Table 8: Iteration 1

ELEMENT	REACHABILITY SET (Pi)	ANTECEDENT SET (Pj)	INTERSECTION	LEVEL
1	1,2,3,4,5,6,7,8,10	1,6,7	1,6,7	
2	2,4,5,6,8,10	1,2,6,10	2,6,10	
3	3,4,5,6,7,8,9,10	1,3,6,7,8,9	3,6,7,8,9	

4	4,5,6,8,10	1,2,3,4,5,6,7,8,9,10	4,5,6,8,10	**II**
5	4,5,6,8,10	1,2,3,4,5,6	4,5,6	
6	1,2,3,4,5,6,7,8,10	1,2,3,4,5,6,9,10	1,2,3,4,5,6,10	
7	1,3,4,7,10	1,3,6,7	1,3,7	
8	3,4,8,10	1,2,3,4,5,6,8,9,10	3,4,8,10	**II**
9	3,4,6,8,9,10	3,9	3,9	
10	2,4,6,8,10	1,2,3,4,5,6,7,8,9,10	2,4,6,8,10	**II**

Table 9: Iteration 2

ELEMENT	REACHABILITY SET (Pi)	ANTECEDENT SET (Pj)	INTERSECTION	LEVEL
1	1,2,3,5,6,7	1,6,7	1,6,7	
2	2,5,6	1,2,6	2,6	
3	3,5,6,7,9	1,3,6,7,9	3,6,7,9	
5	5,6	1,2,3,5,6	5,6	
6	1,2,3,5,6,7	1,2,3,5,6,9	1,2,3,5,6	
7	1,3,7	1,3,6,7	1,3,7	**III**
9	3,6,9	3,9	3,9	

Table 10: Iteration 3

ELEMENT	REACHABILITY SET (Pi)	ANTECEDENT SET (Pj)	INTERSECTION	LEVEL
1	1,2,3,5,6	1,6	1,6	
2	2,5,6	1,2,6	2,6	
3	3,5,6,9	1,3,6,9	3,6,9	
5	5,6	1,2,3,5,6	5,6	**IV**
6	1,2,3,5,6	1,2,3,5,6,9	1,2,3,5,6	**IV**
9	3,6,9	3,9	3,9	

Table 11: Iteration 4

ELEMENT	REACHABILITY SET (Pi)	ANTECEDENT SET (Pj)	INTERSECTION	LEVEL
1	1,2,3	1	1	
2	2,	1,2	2	**V**
3	3,9	1,3,9	3,9	**V**
9	3,9	3,9	3,9	**V**

Table 12: Iteration 5

ELEMENT	REACHABILITY SET (Pi)	ANTECEDENT SET (Pj)	INTERSECTION	LEVEL
1	1	1	1	**VI**

Table 13: Iteration 6

In the above process, the following are the levels found at various iterations:

- In the first iteration, element 11 is found at level 1.
- In the second iteration, elements 4, 8 and 10 are found at level 2.
- In the third iteration, element 7 is found at level 3.
- In the fourth iteration, elements 5 and 6 are found at level 4.
- In the fifth iteration, elements 2, 3 and 9 are found at level 5.
- In the sixth iteration, element 1 is found at level 6.

Developing the Diagraph

Based upon the iteration levels, the final diagraph is developed that includes the transitive links. After the removal of indirect links in the obtained figure, the final diagraph is obtained that is shown in Fig 3.

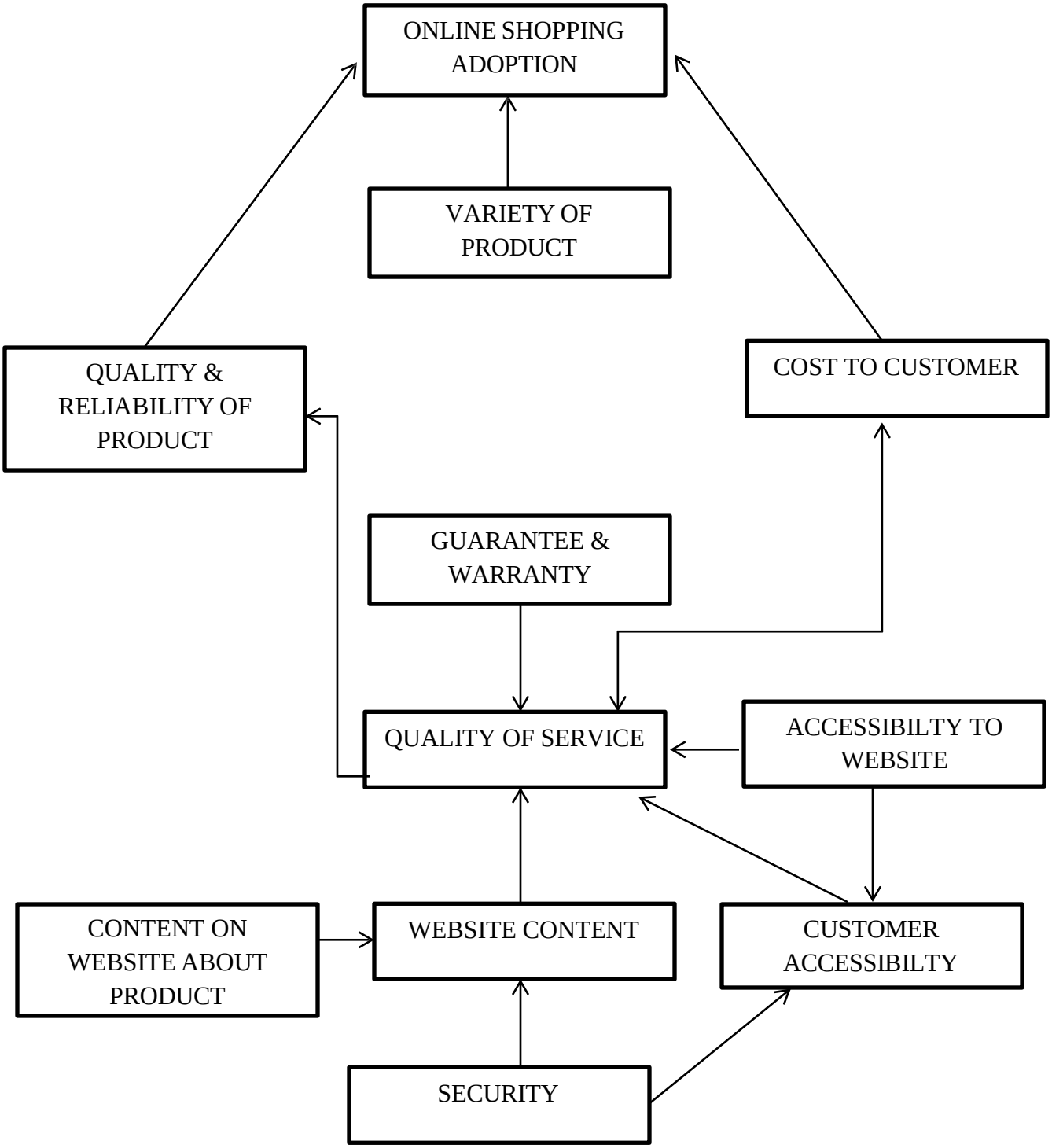

Fig 3: Diagraph on factors for modeling the online shopping adoption

HYPOTHESES TESTING (Hypothesis No. 1 to No. 10)

In order to test the hypotheses 1 to 10, logistic regression analysis was used. Since the value of Chi square is 428.99621 and p value is 0.0001 having degree of freedom 19 so the model fitted the data very well. Since the value of pseudo R square is 0.8635 which means the model explains 86.35% variance in the choice of online shopping. The logistic regression results are given below: -

Factors	B	S. E.	Sig.
Security	-3.4392	0.3824	**0.000***
Customer Accessibility	0.72982	0.2403	**0.014***
Website Contents	0.68917	0.2947	**0.028***
Cost to Customer	5.62912	2.5032	**0.000***
Quality of Service	-1.3902	0.2893	**0.000***
Accessibility	1.6723	0.2408	**0.000***
Guarantee and Warranty	4.7470	3.8838	**0.000***
Product Variety	0.3093	0.2401	**0.023***
Content Available on Website	0.4472	0.3825	**0.000***
Quality and Reliability of Information	0.5824	0.3380	**0.000***

Table 14: Logistic Regression Analysis

On the basis of the above table 14 of logistic regression analysis, the summary of hypothesis testing is given below:

HYPOTHESES	NULL HYPOTHESIS	ALTERNATIVE HYPOTHESIS
Hypothesis 1	REJECTED	**ACCEPTED**
Hypothesis 2	REJECTED	**ACCEPTED**
Hypothesis 3	REJECTED	**ACCEPTED**
Hypothesis 4	REJECTED	**ACCEPTED**
Hypothesis 5	REJECTED	**ACCEPTED**
Hypothesis 6	REJECTED	**ACCEPTED**

Hypothesis 7	REJECTED	**ACCEPTED**
Hypothesis 8	REJECTED	**ACCEPTED**
Hypothesis 9	REJECTED	**ACCEPTED**
Hypothesis 10	REJECTED	**ACCEPTED**

Table 15: Summary of Hypothesis

FINDINGS & CONCLUSION

It is clear from the study that security has an impact on the website content which in turn can affect the quality of service and that has direct impact on the quality and reliability of product which affects the online shopping adoption. Security has an impact on the website content which in turn can affect the quality of service and that has direct impact on the cost to customers which affects the online shopping adoption. Security has an impact on the customer accessibility which in turn can affect the quality of service and that has direct impact on the quality and reliability of product which affects the online shopping adoption. Security has an impact on the website content which in turn can affect the quality of service and the quality of services affected by the variety of products which affects both quality and reliability of product and cost to customer and these dimensions affect the online shopping adoption. The top-level variables have weak driving power and strong dependence on other variables. Bottom level variables that according to the presented model are considered as strong drivers of online shopping adoption.

This research offers some insights into the linkage between e-shopping and customers' decisions to shop or not shop online. This information can help online marketers and retailers to develop appropriate market strategies, make technological advancements, and make the correct marketing decisions in order to retain current customers and attract new customers. Specifically, if online marketers and retailers can better understand their customers, they can present goods and services more effectively and continuously to improve their offerings in order to strengthen their competitive advantage.

There is a positive correlation between factors considered for study and the adoption of online shopping. There is significant relationship between security, content of website and Guarantee of product. Customer Accessibility is significantly related to Website Content, Cost to Customer, Quality of Service, Accessibility, Guarantee and Warrantee and Product Variety. Website content is related to all other factors. It is clear from correlation matrix that most of the factors are significantly related to other factors.

There is significant relationship between Security, Customer Accessibility, Website Content, Quality of Service, Accessibility, Cost to Customer, Guarantee and Warrantee and Product Variety and Adoption of Online Shopping.

SCOPE FOR FUTURE WORK AND LIMITATIONS OF STUDY

In the present work only 36 variables are identified for modeling online shopping adoption. More number of variables can be identified to develop ISM. The experts' help has been sought to analyze driving and dependence power of the variables.

Here the framework developed depends upon the opinion of few experts and has some element of bias. Through ISM, a relationship model among online shopping adoption variables has been developed. This model has not been statistically validated. Structural equation modeling (SEM) has the capability of testing the validity of the model. Therefore, it may be applied in the future research to test the validity of this model.

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