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DETERMINING EFFECT OF WEBOGRAPHICS ON CUSTOMER'S PURCHASE FREQUENCY IN E-RETAIL

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Abstract

Understanding customer's behavioral depositions while interacting with the Web in general has become crucial in the virtual market. Deciphering webographics has become quintessential element for success and survival of any online business. However, there has been no study which has directly investigated the relationship between webographics and purchase frequency. Therefore, with an aim to understand associations between purchase frequency and webographics, web survey has been applied to 308 respondents, who have made at least one online purchase in past six months from prominent e-retailers in India. Significant relationship has been found between purchase frequency and webographic characteristics like internet experience, computer experience, usage level (time spent), access device, access place, web skill and type of data plan used by internet shopper.

Keywords: **Webographics, Electronic Retail, Consumer Behaviour**

INTRODUCTION

There is continuous migration of customers onto online environments and websites are becoming regular and important consumer interfaces [1]. To monetize this impressive opportunity online retailers are continuously expanding themselves to new geographies and physical retailers are entering new markets [2]. Businesses can benefit from this opportunity if they understand customer's shopping motivations [3]. Traditionally, demographic variables have often been studied for segmentation of consumer population and for developing better marketing strategies. However, like offline interactions, individual (webographic) differences are gradually acknowledged as important antecedent [1]. Additionally, individual's attitude towards internet has been identified as predictor of a pleasant website experience [4].

Growing at more than ten percentage points faster than the worldwide average rate Asia-Pacific region is emerging as most promising e-commerce market. This study is conducted in India, which is topping e-commerce revolution in Asia-Pacific region along with China and Indonesia [5,6]. Nonetheless, there is scarcity of research examining the profiles of Asian e-shoppers [7]. Therefore, this research starts with a pretext, whether association exist between webographic characteristics of online shoppers, such as like internet experience, computer experience, usage level (time spent), access device, access place, web skill, internet connection speed, data plan and online purchase frequency. Hypotheses have been developed and tested on the basis of extensive literature review, which are discussed in next section.

LITERATURE REVIEW

Computer Experience

Computer experience in this study is defined as number of years a respondent is using computers. Previous research on e-commerce has indicated that people's inclination towards computers is crucial factor affecting adoption and usage of online shopping [8], [9]. Webster and Martocchio [10] observed that microcomputer playfulness is inversely related with computer anxiety but it's positively related with computer attitudes, computer competence, and computer efficacy, and with outcomes such as involvement, positive mood, satisfaction, and learning. Bellman et al. [11] concluded that income level, gender, computer experience, and use of other face to face shopping methods affects a consumer's decision to purchase online. In an empirical study conducted to determine relationship between university students' computing behavior and their intentions to shop on-line, Han et al. [12] collected data on five independent variables associated with computer experience, on-line behavior and shopping preferences and found that students' computing profile is a good predictor of their intention to shop on-line. Chen et al. [13] noticed that "wired lifestyle" and time starvation greatly influence

online shopping and it can be characterized by a history of using the Internet, sufficient access to the Internet and positive attitude towards Internet's potential to improve personal productivity. Soopramanien et al. [14] studied general acceptance of the Internet by consumers and its affect on adoption and use of online shopping. They asked their respondents to rate their utility derived from using the Internet and computers through six variables i.e. computer ease of use, computer usefulness, whether respondents find computers enjoyable to use, Internet ease of use, Internet usefulness and whether respondents find the Internet enjoyable to use. They found that the utility derived from using the Internet encompasses the utility derived from using computers along three main dimensions: ease of use, usefulness and enjoyment of use as implied under the technology acceptance framework. Considering the role of website/internet quality, Ghalandari [15] investigated the relationship between constructs of online shopping (perceived advantages, perceived risk, perceived trust and computer/web knowledge/experience) and customer's intention to shop online and concluded that trust on online vendor and customer's perception about advantages of online shopping are critical and customer's knowledge and experience with computers and internet helps in building trust. Collectively, the preceding discussion leads to the following hypothesis:

H1: There is significant association between computer experience and purchase frequency.

Internet Experience

Internet experience here in this study is defined as individual's familiarity with internet through his experience with internet over the years. There have been previous studies which signaled how consumer past experience on internet in general or during shopping renders knowledge and consequences that reinforce, shape or moderate the consumer's behavior, beliefs, attitudes, and willingness to shop in Internet stores [16], [17]. Crisp et al. [18] observed that Internet experience, attitudes towards computers, age, household size, and frequency of shopping via direct marketing channels affect intentions towards Internet shopping. Few researchers confirmed difference in online purchase due to difference in internet experience between Internet buyers, Internet non-buyers and dropouts [19] or Internet "veterans" and "newcomers" [20]. Miyazaki and Fernandez [21] found that higher Internet experience and the use of other remote purchasing methods lead to lower levels of perceived risk toward online shopping, which in turns results in higher online purchase rates. In addition to this, they noticed a correlation between amount of internet experience to the perceived fear of privacy rather than security. Chen et al. [13] noticed that "wired lifestyle" and time starvation greatly influence online shopping and it can be characterized by a history of using the Internet, sufficient access to the Internet and positive attitude towards Internet's potential to improve personal productivity. While proposing internet experience as control variables on purchase intentions Pavlou et al. [22] mentioned that online purchasing involves Internet use and lack of Internet experience impedes buyers from engaging in online transactions. In sum, the above discussion leads to the following

hypothesis:

H2: There is significant association between internet experience and purchase frequency.

Web Skill

Web skill in this paper refers to respondent's self-assessment of his ability and proficiency to use the Web [23]. There have been number of studies which linked web skill with online purchase, for instance Li et al. [24] mentioned that a consumer more conversant with Web is more likely to have a positive perception of the channel utilities and have a positive impact on actual online purchases. Frequency of online purchase may also be affected by channel knowledge. Novak et al. [17] found that online search for product information and purchase is strongly related to skill and control. Consumers considering Web to be important were more likely to focus their attention on interaction and were more likely to be skilled at using Web. Case et al. [20] discovered that college students having good computer knowledge are more likely to make online purchases than those with lesser knowledge. In their results they found that the number of Internet purchases made during the last year was directly correlated with computer knowledge and Internet knowledge and Internet use in the predicted direction. In their literature review Li and Zhang [24] cited that knowledge, skill, and experience on the Internet, computer, and online shopping can reduce perceived risk. Koufaris [25] in his study confirmed the double identity of the online consumer as a shopper and a computer user. He tested constructs from information systems (Technology Acceptance Model), marketing (Consumer Behavior), and psychology (Flow and Environmental Psychology) in an integrated theoretical framework of online consumer behavior. He observed a significant impact of product involvement, Web skills, challenges and use of value-added search mechanisms on the Web consumer. Martín and Camarero [26] observed that likelihood of online purchase increase when computer competency of respondent increases to the level of expert. Freeman [27] brought out that the ability to engage in online shopping subjects to the conditions that apply to Internet usage in general. These conditions include a computer with an internet connection, shopper's ability to link to the supermarket website and his competency in navigating within the supermarket website to select items for purchase. In their literature review Chen et al. [28] cited that during the process of human–computer interaction, technology and user behavior coevolve, producing new structure. Therefore electronic stores can customize their services and information as per customer's requirement and expertise. Above discussion lead to following hypothesis:

H3: There is significant association between web skill and purchase frequency.

Access Place

Online shopping is convenient and can be done from any location, but there can be distractions in online shopping at home (such as children, television, and the telephone)

or at the office (where distractions include work, colleagues, and phone calls.) or anywhere, there can be online distractions (e-mail, instant messaging, or other Web sites) [25]. Certain studies found that access point has no direct effect on the probability of purchase [29]. But there have been studies that highlighted the importance of access place, for instance, while differentiating high electronic shopping intention from low electronic shopping intention [8] identified several shopping orientations. Customers with high electronic shopping intention were more likely: (a) to have experience with mail order purchase; (b) to be dissatisfied with local shopping; (c) to feel time pressure for shopping; (d) to be a planned buyer; (e) to be interested in fashion; (f) to be a personal computer user either at home or at the office; and (g) not to enjoy shopping at a mall [9]. While distinguishing Web-shoppers from non-shoppers Karayanni [30] identified three factors of compatibility (use of direct shopping; use of Web browsing activities at home; and use of Web browsing activities at the office), and two factors of relative advantage (motives; and impediments). He further found strong discriminating effects of Web browsing activities performed at the office and home. While studying the effect of various individual difference factors on the consumers' beliefs, attitudes, and intentions toward Internet shopping Crisp et al. [18] found that out of sample of 220 consumers, 47% respondent's accessed internet from home, 42% from office and remaining 8% from other location. In the study conducted to understand consumer trust in an Internet store Jarvenpaa et al. [16] found that 58.9% of their respondents access internet from home and only 5.2% from office. Similarly, Bellman et al. [11] mentioned that "…although survey respondents report connecting to the Web more frequently at the office and at school, more of their Web-use hours are at home, with 21% reporting spending more than 20 hours per week on the Web browsing from home". Ahn et al. [31] found that out of their total sample consisting of students, clerks, specialists, technicians, and housewives; 72.5% of respondents reported home as primary place of internet use, followed by office (26.4%) and other (10.1%). They also found that 80 percent of participants have made purchases through the Internet shopping mall. Although smartphones and tablets are made to be mobile, a surprising report by Nielsen [32] revealed that 95 percent of tablet shoppers and 72 percent of smartphone shoppers make a purchase with their device at home. However, participants in focus groups conducted by Wolfinbarger et al. [33] admitted shopping at work and school, partially because of the broader bandwidth available there. Similarly, Pretorius et al. [1] explored individual (demographic and webographic) differences in internet apprehensiveness and website perceptions (overall satisfaction and website features perception) and found that 69.7% of their respondents access the internet mainly from the office. Following hypothesis is proposed in the light of above discussion:

H4: There is significant association between access place and purchase frequency.

Access Device

Under this study respondent were asked about the device they prefer to use while shopping online. Understanding and knowing about access device is important because these days' consumers have wide option of internet-connected devices for browsing

and buying online. In different regions of World, consumers have different preferences of these devices. For example, computers are most favored device for online browsing and shopping across the globe, but mobile phones are first-access device to the Internet in developing market and second most preferred device in Middle East/Africa, Asia-Pacific and Latin America. Tablets are also becoming popular device for online shopping [34]. The global smartphone penetration forecast by Statista.com [35] predicts that almost 50 percent of mobile users worldwide will own a smart device by 2017. Doherty and Ellis-Chadwick [36] mentioned that under growing pressure from consumers, retailers have to allow their services to be accessed flexibly from a growing array of mobile devices, so that consumer can shop on the move. They also brought up the importance of integration of newer mobile technologies in future i.e. how mobile devices, such as 3G mobile phones or PDAs, and wireless networks will be integrated into the retailers' existing internet infrastructures and online practices. Similarly, Basahih [37] remarked that people's education, availability of mobile devices, openness to the use of technology, and Internet speed support are important factors that affect online retailing adoption. Mobile commerce has made shopping anywhere, anyplace, anytime affair. Consumers are becoming increasingly comfortable with using digital technology in the shopping environment and considerable percent of population is using mobile devices to get discounts, find stores, redeem coupons and compare prices. Biggest challenge for online retailers is to adapt and connect with consumer [38]. Yang [39] discovered partially significant moderating effect of the consumer technology innovativeness characteristic on the relationship between perceived behavioral control and intention to use mobile shopping. Consumers with a higher technology innovativeness characteristic will adopt advanced technology devices earlier and they are likely to perceive mobile shopping as in their control. In contrary, consumers with lower technology innovativeness will be late adopters of mobile shopping because they will perceive the lack of knowledge and technology resources. Lu et al. [40] proposed technology acceptance model (TAM) for wireless Internet. They found that constructs such as individual differences, technology complexity, facilitating conditions, social influences, and wireless trust environment determine user-perceived short and long-term usefulness and ease of using Wireless Internet via mobile devices (WIMD) determine user intention and willingness to adopt WIMD. Jai et al. [41] referred that it's easy to associate an individual with a digital device in the online environment and online shoppers can conveniently connect with retailers' online storefronts, mobile apps or social networks through devices like personal computers, smart phones or tablets. Bruner et al. [42] mentioned that mobile commerce is promising but its effectiveness depends on understanding of consumer acceptance of this technology. They applied technology acceptance model (TAM) in consumer context (c-TAM) and extend it by incorporating both utilitarian and hedonic aspects of technology use. They observed that perceived usefulness has been the predominant driver of technology adoption in workplace settings. Their empirical results showed that consumer adoption of Internet devices is influenced by perceived usefulness (a utilitarian aspect) and 'fun' attribute (a hedonic aspect). Moreover, visually oriented consumers are more likely to adopt these devices. Majority of studies supported the fact that:

H5: There is significant association between access device and purchase frequency.

Usage Level (Time Spent)

To know about usage rate, respondents were asked about number of hours per day they spend on Web. There have been instances where researchers have measured individual's level of Internet usage by measuring frequency of access and the duration of each access [43]. Several past studies linked internet usage level with online purchase. For example, Sin et al. [44] observed that Internet buyers have a high Internet usage rates and they are time conscious, self-confident and have a more positive attitude toward Internet shopping than non-buyers. Bhatnagar et al. [29] brought up the influence of demographics on risk aversion, which indicated that consumers who have spent more time using the Web seem to be more open to purchasing on the Internet. Novak et al. [17] also observed that online customer experience has a positive correlation with amount of time consumers spend online. Lohse et al. [19] found that as compared to Internet buyers, Internet non-buyers and dropouts spend less time per week on the Internet. Chiou et al. [45] noticed less time spent on product's information page and higher tendency for online window shopping by experiential shoppers than goal-oriented shoppers. Their results showed that incase of hedonic products consumers browse more products, spend less time per product, and make more frequent use of the price comparison feature, than utilitarian products. Some researchers link gender with internet usage level, for example previous research indicate that women are less interested in internet, spend less time online and spend less money online than males [46,47]. Certain studies found that students interested in online shopping in next 12 months, have more computer and web experience and spend more time online [12]. Above literature review indicated that:

H6: There is significant association between usage level and purchase frequency.

Connection Speed and Data Plan

To know about the connection speed respondents were asked if they access Web through broadband, dial up, GPRS/2G or 3G/4G networks. Respondents were also asked if they use limited or unlimited data plans. Speed can be defined as the responsiveness of the system, determined by server characteristics and the Internet service provider [48]. Knowing about connection speeds or data plan is important because certain researchers observed that when slow speeds are not well managed, Web waiting time negatively affects consumer evaluation of website content [17,49]. Kim et al. [50] reported that factors like entertainment, convenience, reliability, information quality and speed are related to consumers' satisfaction with Internet shopping and they contribute towards selection of shopping sites. Similarly, Basahih [37] remarked that people's education, availability of mobile devices, openness to the use of technology, and Internet speed support are important factors that affect online retailing adoption. Importance of the factors like broadband access and speed can be estimated from the fact that these factors have been used to calculate E-Commerce

Index scores in Global Retail Development Index developed by Kearney [51]. It's noteworthy to mention that Website quality is directly linked to Website speed. Muylle et al. [52] identify 11 dimensions underlying the website user satisfaction: information relevancy; information accuracy; information comprehensibility; information comprehensiveness; ease of use; entry guidance; web site structure; hyperlink connotation; website speed; layout; and language customization. Muylle et al. [52] cited that website speed (degree to which the user perceives the site to be slow or fast) should be supported by sufficient bandwidth (the amount of network capacity required to support a connection) [53], because user go through many web pages to get desired content. Cox and Dale [54] clearly cited that a customer will never try back a website which is slow and unavailable for a significant amount of time. Similarly, a website with slow home page will lose customer to its competition. Michael [55] highlighted that ability to get fairly wide range of prices, speed and the breadth of information is motivating factor in online shopping. Francis [56] also mentioned that quality of the fulfillment aspect of digital goods is determined by the clarity of instructions for downloading, speed and reliability of the download process. Huang et al. [57] proposed a multidimensional model of M-S-QUAL consisting of five factors i.e. contact, responsiveness, fulfillment, privacy and efficiency, where efficiency measures the speed and ease with which the website is accessed and used. However, while studying the effect of education, internet experience and network speed on the willingness to shop online, Liao et al. [43] found that higher network speed is not a significant determinant of the initial willingness of Singaporeans to e-shop on the Internet. This result can be attributed to the fact that Internet transaction costs, such as e-search cost, are very low in a country like Singapore which is infrastructurally and technologically advanced. Above literature review indicated that:

H7: There is significant association between connection speed and purchase frequency.

H8: There is significant association between data plan and purchase frequency.

METHODOLOGY

In this section study's research goal and the means of data collection are discussed. Later, results of chi-square test to check association between webograhic characteristics and online purchase frequency have been discussed. At the end, post hoc test using standard residual method has been performed and discussed.

Research Goal

There have been previous studies which have partially discussed about Webographics and online behavior but there is no study which comprehensively discuss about webographic characteristics and their effect on purchase frequency. In addition, research examining the profiles of Asian e-shoppers is scarce [7] and India, where this study has been conducted has been named among emerging e-commerce markets in Asia-Pacific region, clocking a progressive 129.5% growth [6]. To capitalize this

research gap, this study tries to ascertain association between webograhic characteristics of online shoppers, such as computer experience, internet experience, web skill, access place, access device, usage level (time spent), connection speed, data plan and their online purchase frequency

Sample and Data Collection

An online approach has been adopted and email with embedded link to the URL containing questionnaire has been sent to the respondents residing in three capital cities of Northern India i.e. Chandigarh, Delhi/National Capital Region and Jaipur have been included. Selection of these cities was based on eBay. In Census 2012 [58], which identified these cities among top ten e-commerce hubs. Snowball sampling [59] was deployed i.e. an initial group of respondents were selected randomly and subsequent respondents were selected based on the referrals. The survey was able to achieve balanced proportion in terms of occupation and gender because it can significantly affect the outcome [60]. Considering 300 cases as good sample size [61-63], total 308 responses have been used for data analysis. E-retailers in this research denotes business-to-consumer e-commerce companies selling products to consumers in categories like clothing and accessories, books and magazines, mobile phones and accessories, auto accessories and parts, memory cards, pen drives and HDD, watches, laptops and computer peripherals, shoes and other footwear, movies and music (CD/DVD) and home appliances. Demographic profile of the respondents has been depicted in Table 1.

ANALYSIS AND RESULTS

The next step of the analysis was to estimate the association between webograhic characteristics and online purchase frequency. The proposed hypotheses were tested by means of Chi-square test. It was found that in low purchase frequency (1-3 times), respondents with computer experience less than 3 years have high percentage (68.3%). In mid purchase frequency (4-6 times), respondents with computer experience of 7-10 years have high percentage (27.8%). In high purchase frequency (more than 6 times) respondents with computer experience of more than 10 years have higher percentage (41.1%) (Table 2). Chi-square test values indicated that there is significant association between computer experience and purchase frequency, χ^2 (6, N=308)=27.316, p=0, therefore H1 is accepted.

Demographic variables		Frequency	Valid Percent	Cumulative Percent
City	Delhi/NCR	108	35.1	35.1
	Jaipur	93	30.2	65.3
	Chandigarh/Tricity	107	34.7	100.0
Education	Undergraduate	52	16.9	16.9
	Graduate	82	26.6	43.5

	Postgraduate	109	35.4	78.9
	Professional	65	21.1	100.0
Age	18-24 Years	137	44.5	44.5
	25-31 Years	127	41.2	85.7
	32-38 Years	32	10.4	96.1
	39 Years & Above	12	3.9	100.0
Gender	Male	168	54.5	54.5
	Female	140	45.5	100.0
Monthly Family Income	Less than 50,000	66	21.4	21.4
	50,001-80,000	72	23.4	44.8
	80,001-1,10,000	34	11.0	55.8
	1,10,001-1,40,000	28	9.1	64.9
	More than 1,40,000	108	35.1	100.0
Profession	Business	28	9.1	9.1
	Service	173	56.2	65.3
	Student	107	34.7	100.0
Marital Status	Married	72	23.4	23.4
	Unmarried	236	76.6	100.0

Table 1: Demographic profile of the respondents (N=308).

In case of internet experience it was observed that in low purchase frequency (1-3 times), respondents with internet experience less than 2 years have high percentage (68.3%). In mid purchase frequency (4-6 times), respondents with internet experience of 5-7 years have high percentage (28.1%). In high purchase frequency (more than 6 times) respondents with internet experience of more than 7 years have higher percentage (43.4%) (Table 2). Chi-square test values indicated that there is significant association between internet experience and purchase frequency, χ^2 (6, N=308)=36.4, p=0, hence H2 is accepted.

For web skill it was noticed out that in low purchase frequency (1-3 times), respondents with fair ability to use internet have high percentage (71.4%). In mid purchase frequency (4-6 times), respondents with good ability to use internet have high percentage (26.5%). In high purchase frequency (more than 6 times) respondents with very good ability to use internet have higher percentage (44.4%). Chi-square test values indicated that there is significant association between ability to use internet and purchase frequency, χ^2 (8, N=308)=45.061, p=0 (Table 2), therefore H3 is accepted.

In case of access place, chi-square test values indicate that there is significant association between access place and purchase frequency with respect to home, χ^2 (2, N=308)=11.253, p=0.004 (Table 2). Similarly, Chi-square test values indicated that there is significant association between access device and purchase frequency and

significant association was found in purchase frequency with respect to tablet, χ^2 (2, N=308)=22.598, p=0 and mobile phone, χ^2 (2, N=308)=11.519, p=0.003 (Table 2), therefore H4 and H5 are accepted.

	Webographic characteristics		**Purchase frequency**				**Chi-square**		
			1-3 times	**4-6 times**	**More than 6 times**	**Total**	**χ^2**	**df**	**Asymp. Sig. (2-tailed)**
a	Computer experience	Less than 3 years	7	3	1	11	27.316	6	0*
			63.6%	27.3%	9.1%	100.0%			
		3-6 years	41	13	6	60			
			68.3%	21.7%	10.0%	100.0%			
		7-10 years	50	30	28	108			
			46.3%	27.8%	25.9%	100.0%			
		More than 10 years	45	31	53	129			
			34.9%	24.0%	41.1%	100.0%			
b	Internet experience	Less than 2 years	4	1	1	6	36.4	6	0*
			66.7%	16.7%	16.7%	100.0%			
		2-4 years	43	15	5	63			
			68.3%	23.8%	7.9%	100.0%			
		5-7 years	49	27	20	96			
			51.0%	28.1%	20.8%	100.0%			
		More than 7 years	47	34	62	143			
			32.9%	23.8%	43.4%	100.0%			
c	Ability to use internet	Very Poor	0	1	0	1	45.061	8	0*
			0.0%	100.0%	0.0%	100.0%			
		Poor	0	1	0	1			
			0.0%	100.0%	0.0%	100.0%			
		Fair	20	4	4	28			
			71.4%	14.3%	14.3%	100.0%			
		Good	79	36	21	136			
			58.1%	26.5%	15.4%	100.0%			
		Very Good	44	35	63	142			
			31.0%	24.6%	44.4%	100.0%			
d	Home	No	19	2	3	24	11.253	2	0.004*
			79.2%	8.3%	12.5%	100.0%			
		Yes	124	75	85	284			
			43.7%	26.4%	29.9%	100.0%			
	Office	No	74	31	35	140	4.269	2	0.118

			52.9%	22.1%	25.0%	100.0%			
		Yes	69	46	53	168			
			41.1%	27.4%	31.5%	100.0%			
	Cyber Cafe	No	118	70	74	262	2.866	2	0.239
			45.0%	26.7%	28.2%	100.0%			
		Yes	25	7	14	46			
			54.3%	15.2%	30.4%	100.0%			
	Any Other Place	No	139	77	86	302	2.118	2	0.347
			46.0%	25.5%	28.5%	100.0%			
		Yes	4	0	2	6			
			66.7%	0.0%	33.3%	100.0%			
e	PC Laptop	No	9	3	1	13	3.611	2	0.164
			69.2%	23.1%	7.7%	100.0%			
		Yes	134	74	87	295			
			45.4%	25.1%	29.5%	100.0%			
	Tablet	No	125	63	54	242	22.598	2	0*
			51.7%	26.0%	22.3%	100.0%			
		Yes	18	14	34	66			
			27.3%	21.2%	51.5%	100.0%			
	Mobile Phone	No	52	20	14	86	11.519	2	0.003*
			60.5%	23.3%	16.3%	100.0%			
		Yes	91	57	74	222			
			41.0%	25.7%	33.3%	100.0%			
f	Usage level (Hours/day)	Less than 2 hours	36	10	6	52	22.672	6	0.001*
			69.2%	19.2%	11.5%	100.0%			
		2-3 hours	46	23	21	90			
			51.1%	25.6%	23.3%	100.0%			
		4-5 hours	27	14	20	61			
			44.3%	23.0%	32.8%	100.0%			
		More than 5 hours	34	30	41	105			
			32.4%	28.6%	39.0%	100.0%			
g	Connection speed	Broadband	85	45	55	185	3.434	6	0.753
			45.9%	24.3%	29.7%	100.0%			
		Dial up	6	1	1	8			
			75.0%	12.5%	12.5%	100.0%			
		2G/GPRS	21	13	11	45			
			46.7%	28.9%	24.4%	100.0%			
		3G/4G	31	18	21	70			
			44.3%	25.7%	30.0%	100.0%			

h	Data plan	Limited	51	14	14	79	14.15	2	0.001*
			64.6%	17.7%	17.7%	100.0%			
		Unlimited	92	63	74	229			
			40.2%	27.5%	32.3%	100.0%			
	Total		143	77	88	308			
			46.4%	25.0%	28.6%	100.0%			

Table 2: Purchase frequency and Webographics (N=308).

It was revealed that in low purchase frequency (1-3 times), respondents with usage level less than 2 hours have high percentage (69.2%). In mid (4-6 times) and high (more than 6 times) purchase frequency, respondents with usage level more than 5 hours have high percentages of 28.6 and 39 respectively (Table 2). Chi-square test values indicated that there is significant association between usage level and purchase frequency, x^2 (6, N=308)=22.672, p=0.001, hence H6 is accepted.

The study brought out that in low purchase frequency (1-3 times), respondents with dial up connection have high percentage (75%). In mid purchase frequency (4-6 times), respondents with 2G/GPRS connection have high percentage (28.9%). In high purchase frequency (more than 6 times) respondents with 3G/4G connection have higher percentage (30%) (Table 2). Chi-square test values indicated that there is no significant association between connection speed and purchase frequency, x^2 (6, N=308)=3.434, p=0.753, therefore H7 is rejected.

The study found that in low purchase frequency (1-3 times), respondents with limited data plan have high percentage (64.6%). In mid (4-6 times) and high (more than 6 times) purchase frequency respondents with unlimited data plan have higher percentages of 27.5 and 32.3 respectively (Table 2). Chi-square test values indicated that there is significant association between data plan and purchase frequency, x^2 (2, N=308)=14.15, p=0.001, hence H8 is accepted.

Post Hoc

As omnibus chi-square value does not specify which combination of categories contributes to statistical significance a standard residual method suggested by Beasley et al. [64] has been applied with the help of SPSS 18. In general, greater than 2.00 rule of thumb is an approximation of the two tailed critical value of z at α=.05 level of significance.

In case of computer experience, there are 12 cells values being tested, resulting in an α_{adj} of 0.0041. Adjusted z score values, chi-square values and p-values have been depicted in Table 3. It can be seen that, the standard residual in four cells CE12, CE32, CE14 and CE34 significantly contributed to significant omnibus chi-square statistic. Thus, a chi-square post hoc test via standard residual method confirmed that purchase

frequency of 1-3 times and more than 6 times by respondents having 3-6 years and more than 10 years of computer experience is significant.

Computer experience		Purchase Frequency			Total
		1-3 times	4-6 times	More than 6 times	
Less than 3 years	Count$^{Cell\ number}$	7 ^{CE11}	3^{CE21}	1^{CE31}	11
	Adjusted Residual	1.2	0.2	-1.5	
	Chi-square value	1.44	0.04	2.25	
	P-value	0.23	0.84	0.13	
3-6 years	Count$^{Cell\ number}$	41^{CE12}	13^{CE22}	6^{CE32}	60
	Adjusted Residual	3.8	-0.7	-3.5	
	Chi-square value	14.44	0.49	12.25	
	P-value	0*	0.48	0*	
7-10 years	Count$^{Cell\ number}$	50^{CE13}	30^{CE23}	28^{CE33}	108
	Adjusted Residual	0	0.8	-0.8	
	Chi-square value	0	0.64	0.64	
	P-value	1	0.42	0.42	
More than 10 years	Count$^{Cell\ number}$	45^{CE14}	31^{CE24}	53^{CE34}	129
	Adjusted Residual	-3.4	-0.3	4.1	
	Chi-square value	11.56	0.09	16.81	
	P-value	0*	0.76	0*	
Total	Count	143	77	88	308

Table 3: Computer experience and purchase frequency, post hoc using standard residual method.

Similarly, in case of internet experience, there are 12 cells values being tested, resulting in a α_{adj} of 0.0041. Adjusted z score values, chi-square values and p-values have been depicted in Table 4. It can be seen that, the standard residual in four cells IE12, IE32, IE14 and IE34 significantly contributed to significant omnibus chi-square statistic. Thus, a chi-square post hoc test via standard residual method confirmed that purchase frequency of 1-3 times and more than 6 times by respondents having 2-4 years and more than 7 years of internet experience is significant.

Internet experience		Purchase Frequency			Total
		1-3 times	**4-6 times**	**More than 6 times**	
Less than 2 years	Count $^{Cell\ number}$	4^{IE11}	1^{IE21}	1^{IE31}	6
	Adjusted Residual	1	-0.5	-0.7	
	Chi-square value	1	0.25	0.49	
	P-value	0.32	0.62	0.48	
2-4 years	Count $^{Cell\ number}$	43^{IE12}	15^{IE22}	5^{IE32}	63
	Adjusted Residual	3.9	-0.2	-4.1	
	Chi-square value	15.21	0.04	16.81	
	P-value	0*	0.84	0*	
5-7 years	Count $^{Cell\ number}$	49^{IE13}	27^{IE23}	20^{IE33}	96
	Adjusted Residual	1.1	0.9	-2	
	Chi-square value	1.21	0.81	4	
	P-value	0.27	0.37	0.05	
More than 7 years	Count $^{Cell\ number}$	47^{IE14}	34^{IE24}	62^{IE34}	143
	Adjusted Residual	-4.4	-0.5	5.3	
	Chi-square value	19.36	0.25	28.09	
	P-value	0*	0.62	0*	
Total	Count	143	77	88	308
*Significant at 0.05					

Table 4: Internet experience and purchase frequency, post hoc using standard residual method.

In case of Web skill, there are 15 cells values being tested, resulting in a α_{adj} of 0.0033. Adjusted z score values, chi-square values and p-values have been depicted in Table 5. We can notice that standard residual in four cells WS14, WS15, WS34 and WS35 significantly contributed to significant omnibus chi-square statistic. Thus, a chi-square post hoc test via standard residual method confirmed that purchase frequency of 1-3 times and more than 6 times by respondents having good and very good level of web skill is significant.

Web skill	**Purchase Frequency**	**Total**

		1-3 times	4-6 times	More than 6 times	
Very poor	Count$^{Cell\ number}$	0^{WS11}	1^{WS21}	0^{WS31}	1
	Adjusted Residual	-0.93	1.73	-0.63	
	Chi-square value	0.86	2.99	0.40	
	P-value	0.35	0.08	0.53	
Poor	Count$^{Cell\ number}$	0^{WS12}	1^{WS22}	0^{WS32}	1
	Adjusted Residual	-0.93	1.73	-0.63	
	Chi-square value	0.86	2.99	0.40	
	P-value	0.35	0.08	0.53	
Fair	Count$^{Cell\ number}$	20^{WS13}	4^{WS23}	4^{WS33}	28
	Adjusted Residual	2.78	-1.37	-1.75	
	Chi-square value	7.73	1.88	3.06	
	P-value	0.01	0.17	0.08	
Good	Count$^{Cell\ number}$	79^{WS14}	36^{WS24}	21^{WS34}	136
	Adjusted Residual	3.65	0.53	-4.54	
	Chi-square value	13.32	0.28	20.61	
	P-value	0*	0.60	0*	
Very good	Count$^{Cell\ number}$	44^{WS15}	35^{WS25}	63^{WS35}	142
	Adjusted Residual	-5.03	-0.13	5.68	
	Chi-square value	25.30	0.02	32.26	
	P-value	0*	0.90	0*	
Total	Count	143	77	88	308
*Significant at 0.05					

Table 5: Web skill and purchase frequency, post hoc using standard residual method.

In case of usage level there are 12 cells values being tested, resulting in a αadj of

0.0041. Adjusted z score values, chi-square values and p-values can be seen in Table 6. We can see that standard residual in four cells UL11, UL31, UL14 and UL34 significantly contributed to significant omnibus chi-square statistic. Thus, a chi-square post hoc test via standard residual method confirmed that purchase frequency of 1-3 times and more than 6 times by respondents spending less than 2 hours/day and more than 5 hours/day are significant.

Usage level/day		Purchase Frequency			Total
		1-3 times	**4-6 times**	**More than 6 times**	
Less than 2 hours	Count$^{Cell\ number}$	36^{UL11}	10^{UL21}	6^{UL31}	52
	Adjusted Residual	3.6	-1.1	-3	
	Chi-square value	12.96	1.21	9	
	P-value	0*	0.27	0*	
2-3 hours	Count$^{Cell\ number}$	46^{UL12}	23^{UL22}	21^{UL32}	90
	Adjusted Residual	1.1	0.1	-1.3	
	Chi-square value	1.21	0.01	1.69	
	P-value	0.27	0.92	0.19	
4-5 hours	Count$^{Cell\ number}$	27^{UL13}	14^{UL23}	20^{UL33}	61
	Adjusted Residual	-0.4	-0.4	0.8	
	Chi-square value	0.16	0.16	0.64	
	P-value	0.69	0.69	0.42	
More than 5 hours	Count$^{Cell\ number}$	34^{UL14}	30^{UL24}	41^{UL34}	105
	Adjusted Residual	-3.6	1	2.9	
	Chi-square value	12.96	1	8.41	
	P-value	0*	0.32	0*	
Total	**Count**	**143**	**77**	**88**	**308**
Significant at 0.05					

Table 6: Usage level and purchase frequency, post hoc using standard residual method.

CONCLUSIONS, IMPLICATIONS AND FUTURE DIRECTIONS

This is the first known comprehensive study to have examined the association between webograhic characteristics of online shoppers, such as computer experience, internet experience, web skill, access place, access device, usage level (time spent), connection

speed, data plan and their online purchase frequency. The findings offer support to most of the hypothesis proposed in the study. Overall webographic characteristics have substantial effect on online purchase frequency.

Certain implications arise from these findings. For instance, post hoc using standard residual method confirmed that respondents with high frequency of online purchase are those who have greater computer and internet experience, excellent web skills and use internet for more number of hours. In an open environment like WWW, computer skill of user may vary from novice to expert. A user is motivated to choose one site over other as per his ease of use perceptions [65]. Incase user is unable to find a desired product or information on a B2C website, user will typically leave that site [66]. Findings indicate that online shopping can be difficult for a novice with lesser online experience. Visitor may take more time during online purchase due to hedonic reasons; or visitors may find the website complicated enough to gather, sort, analyze and evaluate information available online to make a final purchase decision. This situation presents an opportunity to online retailer to optimally design (simplify) their websites in a manner that appeals to their target market. There are number of aspects of website like information relevancy, information accuracy, information comprehensiveness, ease of use, entry guidance, website structure, hyperlink connotation, website speed, layout/visual appeal, interactivity etc. [1,52]. A future research can be undertaken to understand how Webographics affects website quality perception.

Findings of this research signal that online buyers prefer mobile devices for online purchase. Consumer opt for mobile devices because they are convenient and "always on" [67]. Here is an opportunity for e-retailers to launch their mobile apps and offer special discounts on purchases through their apps. A mobile commerce website can provide powerful competitive advantages, however there are numerous factors like security, design and content that may influence the customers' trust in mobile commerce websites [68]. Similarly, despite of its ubiquitous nature, conversation rate (i.e. browsing to complete purchase) through mobile sites are low as compared to desktop sites. Therefore, mobile retailers trying to deliver a superior service must understand how consumers perceive their services [57], thus making mobile service quality another conspicuous field of study.

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