BRAND ANALYSIS ON LAPTOP COMPUTERS: DHAKA UNIVERSITY STUDENTS' PERSPECTIVE

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Abstract: This study seeks to analyze how university students evaluate their favorite laptop computer brands. The purpose of this paper lies in identifying the most favorite laptop brand and the key attributes for choosing that brand and assessing the effects of brand communications on brand equity dimensions. The results suggest the ways in which marketers can maximize the benefits from this segment.

Keywords: Brand, Brand Equity Dimensions, Brand Communications, Laptop Computer.

INTRODUCTION

In the past, laptop computers occupied just a small niche in the market and were used only in specialized fields. But now laptops have become household products. Students, business people, professional users cannot live their life without it. Before 10 to 15 years ago, laptop computers were treated as luxury products for college and university students in Bangladesh. But now it is like a pen or a book. While to keep pace with the western world, the use of Information and Communication Technology (ICT) in education is increasing day by day in Bangladesh. Bearing in mind the fact that students in remote areas are not left out of the knowledge and benefit of ICT, 17 mobile computer labs and 1 mobile science lab have been established by the government(Bangladesh E. Review, 2012). Besides, there are more than 10 types of foreign laptop brands available in Bangladesh namely Apple, Samsung, HP, Dell, Lenovo, Sony-Vio, Fujitsu, Acer, Asus and Toshiba. These are imported from Asia Pacific regions. Furthermore, Bangladesh is now manufacturing low priced laptop brand named "Doel". Hence, it is an opportunity for the marketers to manufacture or assemble economical and quality laptop computers for Bangladeshi students.

Therefore, the purposes of this study is to identify students' most favorite laptop brand, determine the most preferred attributes for choosing that brand and examine the effects of brand communications on brand equity dimensions.

Abdullah H. Kafi , former President of Bangladesh Computer Samity (BCS) and present chair of Asian-Oceania Computing Industry Organization (ASOCIO) said that "Asia will control 40% of World Economy by 2020" in a conference held in Bangladesh (Tech World Bangladesh, 2013). Bangladesh is a country of limitless opportunities and prosperities. Software giant Microsoft is opening up

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application developer internship opportunity to the technical students in Bangladesh for the first time (Tech World Bangladesh, 2013). Likewise, Bangladesh Telecommunications Company Limited (BTCL) has taken up a series of activities for promoting the ICT sector. For example, in September 2013 Bangladesh Telecommunication Regulatory Commission (BTRC) licenses to four major mobile operators in Bangladesh: Grameen Phone, Banglalink Robi and Airtel, and introduces 3G (Third-Generation) mobile phone services in this country. Besides, the government has declared the ICT as a thrust sector for achieving the target of MDG (Millennium Development Goals) within 2015 by using the ICT (Bangladesh E. Review, 2012). This sector entails huge job opportunities for the unemployed youths. Furthermore, under the 'Leveraging ICT for Growth, Employment, and Governance Project' about 4,000 fast track future Information Technology (IT) leaders will get job in IT Enabled Service companies (Tech World Bangladesh, 2013).

LITERATURE REVIEW

Brand contributes a significant role both for the consumer and the company. In the context of technological product, where perceived risk and uncertainty is often higher than packaged goods, brands play a particularly important role to consumers. Brand is no longer considered as a name to technological companies. Because in the technological product market, financial success in not only driven by product innovation but also marketing skills are required for long-term achievement.

Brand is Different from Product

A brand is distinguished from a product, which is defined as anything that can be offered to a market for attention, acquisition, use, or consumption that might satisfy a need or want (Kotler, 2006). Dissimilarly, a brand is a product, but one that adds other dimensions that differentiate it in some way from other products designed to satisfy the same need (Keller, 2008). For example, all of the laptop brands like- Apple, HP, Dell, Lenovo, Acer, Asus, etc. might satisfy the same need but the brand name and added values with it differentiates one laptop to another. Again, given the complexity of assessing and interpreting product attributes and benefits for high-tech products, particularly for laptop computers, which can fall in the category of both search and experience quality, brand name plays an important role for signaling the quality of laptop. Before buying a laptop 'search qualities' help consumer to judge the product by its attributes, but without using a laptop consumer will not be able to evaluate the functional quality of a laptop. Therefore, for laptop computer brands, product attributes and serviceability both are imperative for consumers.

Product's Attributes Signal the Quality of a Brand

Consumers in the technology markets are motivated by a perceived need. The key to branding is that consumers perceive differences among brands in a product

category (Keller, 2008). These differences can be related to attributes or benefits of the product itself, or they may be related to more intangible image considerations (Keller, 2008). 'Intel' has spent large amount of money on it's "Intel Inside" promotions to brand its microprocessors as delivering the highest level of performance and safety or confidence possible (Keller, 2008). For example, a laptop computer's product features are similar and creates a virtually level playing field. Every year an online survey is conducted by Square Trade, PC Magazine and Top Ten Reviews (Tech World Bangladesh, 2013) on laptop computers.

'Top 10 Laptop Reviewer' conducted a survey on laptop brands. It examines the overall performance of the laptop brands. Apple is taking the first place for the past three years. These kind of research are helpful both for marketers and consumers. Because the findings will lead marketers to manufacture products which will be competent enough to satisfy consumers perceived needs. Moreover, research findings assist consumers to narrow down their preferences. Nevertheless, in Bangladesh this kind of surveys are not conducted.

Since, all product-based attributes are equal, the importance of brand and brand equity are overstated, and the more the manufacturers can associate that equity to the overall product, the easier it is for them to qualify the investment in marketing versus research and development (McClary, 2006). Bearing this fact in mind the author of this research had conducted an exploratory research to identify the important attributes for choosing a laptop computer. From the exploratory research it was found that brand image, speed, latest software, price, design, storage capacity, battery life, latest feature set, ease of purchase and after sales services were important attributes for choosing a laptop computer among university students. These attributes are explained in brief:

Brand Image: It is the consumers' perceptions about a brand, as reflected by the brand associations held in the memory (Keller, 2008).

Speed: The best laptops feature a fast, powerful processor. Speed is necessary for graphics designs and gaming.

Latest Software: The functionality of any laptop depends on the software. Latest software havevarious new features and competency than older version.

Price: Price is the amount of money charged for a product or service, or the sum of the values that consumers exchange for the benefits of having or using the product or service (Kotler, 1996). Price is one of the important indicator of quality. Consumer perceives that high prices signals better quality product and low price signals low quality product.

Design: The main purpose of laptop computers is portability without sacrificing the desktop functionality. A mini laptop is the most desirable.

Storage Capacity: Consumer looks for laptop with at least 2GB of RAM (Random Access Memory) or more. Some laptops have the capacity or option to install either a hard drive or storage drive.

Battery Life: A long battery life will let consumer spend hours on laptop without having to plug in or electricity.

Latest Feature Set: The top laptops on the market generally include several connectivity options, such as Wi-Fi, Bluetooth, HDMI, multiple USB 3.0 ports, SD card readers, DVD ROM, DVD writer, etc.

Ease of Purchase: How easily a laptop can be purchased from a shop without hassel and having easy installment facility.

After Sale Service: Normally laptop companies feature a one-year warranty for laptop parts. Some company offer email, phone and live chat support to help consumer when technical problems arise.

The Value of a Brand is Realized from Brand Equity

Brand "identifies and embodies all that a company is" (Greenbaum, 2006). In essence, Kotler (1991) provides an insightful definition of the term 'brand' that helps to remove difficulties in on the benefits: "a brand can be defined as a name, term, sign, symbol or combination of them which is intended to identify goods and services of one seller to differentiate them from those of competitors". Therefore, Branding is essential to all companies with the purpose of distinguishing their products from those of their competitors. The use of brands has changed over the years and has develop from only representing the product's name to now giving the product a deeper meaning (Murphy, 1992). Because, the branded product does not only satisfy the customer's rational need, but also provides certain benefits that will satisfy emotional needs (De Chernatony et al., 1998). It is the value realized as a result of the brand, or else known as brand equity.

According to Aaker (1991) brand equity is "….a set of brand assets and liabilities linked to a brand, its name and symbol, that add to or subtracts from the value provided by a product or service to a firm and/or to that firm's customers". Aaker (1991) said that brand equity is consist of brand loyalty, brand awareness, perceived quality, brand associations and other proprietary brand assets. As the definition indicates, all of these properties are deliberate to generate value to both for the customer and the firm.

Keller (1993) defines brand equity as "the differential effect brand knowledge has on response to a marketing program" (Keller, 1993). Basically, Brand knowledge consists of brand awareness and brand image (Keller, 1993). Berry (2000) defines brand equity as "the differential effect of brand awareness and brand meaning combined on customer response to the marketing of the brand", which similar to that of Keller's (1993) definition of brand equity. In Berry's (2000) model, brand equity is consists of brand awareness and brand meaning, where brand meaning has a superior power on brand equity than brand awareness. Brand awareness is mainly composed of the presented brand or company controlled communications, but it is also affected by external brand

communications or company uncontrolled communications. Brand meaning is directly affected by the customer's experience with the company, but also indirectly affected by external communication and the presented brand. Both company presented brand and external brand communications can be termed combinedly as brand communications.

In view of the above given definitions, it is understood that brand communications includes advertising, sales promotion, publicity, personal selling, word-of-mouth etc. Furthermore, it is also understood that brand awareness, brand association, perceived quality and brand loyalty as common dimensions of brand equity, which standpoint has been adopted by other researchers (Tong et al., 2009; Yoo et al., 2000; Chen et al., 2010; Erenkol et al., 2010).

Brand Communications

Despite the rapid introduction and removal of models and changing consumer preferences, managers need to examine the effects of marketing communications on the laptop computer brands. Jedidi, Mela, and Gupte (1999) recognize the importance of advertising and promotions in influencing brand preferences. Although, high-tech companies have small budget for marketing communications, they need to prioritize their communication mix from most important to least important. In this survey the impact of four types of promotional activities like - advertising, sales promotion, publicity, and word-of-mouth, on brand equity dimensions will be examined.

Advertising

Advertising is a non-personal communication and promotion of ideas, goods or services by an identified sponsor by various media (Kotler et al., 2006, Nelson, 2010). Moreover, Consequently, based on past research (Aaker, 1991; Batra et al., 1995; Keller, 1993; Rossiter and Percy, 1987; Yoo et al., 2000; Krishman and Chakravarti, 1993; Huang et al., 2011), it can be said that, advertising can create and increase brand awareness by exposing brands to customers, as well as it reinforce the brand's likelihood of being included in consumers' mind set, thereby enhancing the market performance of a brand.

Word of Mouth

Word of mouth (w-o-m) is argued to be an informal tool of communication between private parties in which evaluation of a product or service takes place (Mazzarol et al., 2007; Lim et al., 2011). Moreover, w-o-m is a transmitting tool, which has a greater influence than other marketing activities such as print advertising, personal selling and radio advertising. (De Bruyn et al., 2008).

Sales Promotion

Sales promotion is seen as temporary incentives to encourage the trial or use of a product or service (Tong et al., 2009; Delvecchio et al., 2006). It includes short-term price reduction, premium (free gift with purchase, coupons package, cents-

off and price deal and refunds, that firms have utilized frequently in order to make a stronger and quicker buyers response (Kotler et al., 2006; Shih, 2010). However, Bangladeshi consumers are like to get sales promotion whenever they purchase any expensive products. At the time of computer fare laptop sales are increased.

Publicity

A common misunderstanding is that publicity is the same as public relations (PR). Instead publicity is a part of PR along with for example promotions, community relations, media relations etcetera (Marconi, 1999). Publicity is about managing information intended for one or more audiences with the purpose of influencing their opinions or decisions (Marconi, 1999). This opinion can be positive or negative.

Four Brand Equity Dimensions

Hence, this study will adopt four common dimensions of brand equity i.e., brand awareness, brand association, perceived quality, and brand loyalty.

Brand Awareness: Brand awareness is defined as "the ability of a buyer to recognize or recall that brand is a member of certain product category" (Aaker, 1991). Keller (1993) found that it composes of both brand recall and recognition. On the other hand, Berry (2000) argues that the primary source of brand awareness is the company's presented brand, i.e., the company's controlled communications. Further, Berry argues that such communication can be conveyed via the firm's advertising or promotional materials, service facilities, the appearance of their service employees, the company's name and logo and symbolic associations. The next key construct in Berry's model is the external brand communications. This refers to the information that consumers gather about the service brand from uncontrolled sources, i.e. word-of-mouth communications and publicity. Both the presented brand and external brand communications can be termed combinedly as brand communications.

Brand Association: Brand association is another key dimension of brand equity. It is described as "anything linked in memory to a brand" and brand image is as seen as "a set of associations, usually related in some meaningful way" (Aaker, 1991). However, the association to a brand might be stronger when it is based on numerous experiences or exposure to communications, rather than few (Aaker, 1991; Marinova et al., 2011).

Perceived Quality: Perceived quality is one of the main dimensions of brand equity; it is "the core construct" in the study to measuring brand equity (Aaker, 1996). Perceived quality is defined as "the consumer's subjective judgment about a product's overall excellence or superiority" (Zeithaml, 1988). That is, perceived quality is not the real quality of product, but the consumer's subjective assessment of that product (Zeithaml, 1988; Erenkol et al., 2010). "Personal product experience, unique needs, and consumption situation" can be affecting the consumer's subjective evaluation of quality (Yoo et al., 2000).

Brand Loyalty: Aaker (1991) states that, brand loyalty is "a measure of the attachment that a customer has to a brand". Subsequently, Oliver (1979) explains brand equity as " a deeply held commitment to re-buy or re-patronize a preferred product or service consistently in the future, deposit situation influences and marketing efforts having the potential to cause switching behavior". Consequently, brand loyalty is different from other brand equity dimensions, because it is associated with usage experience (Aaker, 1991).

In view of these literatures the following objectives are furnished to undertake brand evaluation of laptop computers.

OBJECTIVES

The broad objective of the study is gaining an understanding about the brand evaluation by university students for laptop computers in Dhaka. To explore the broad objective, this study pursues several specific objectives that follow:

1. To identify the most favorite laptop computer brand.

2. To determine the attributes of the most preferred laptop computer brand.

3. To assess the effects of brand communications on brand equity dimensions for laptop computer.

METHODOLOGY

This is a descriptive research where quantitative data, pertinent to the objectives of the research, have been collected and analyzed. Out of 300 laptop users/ MBA students of Dhaka University, 114 users had Dell laptops. Therefore, the sample size is 114. A general guideline is that there should be at least four or five times as many sample size as there are variables (Malhotra, 2010). But this ratio is lower for marketing research.

In this survey for preference data analysis the sample size is considered to be 114 for 10 attributes. For examining the effect of brand communications on brand equity dimensions sample size is determined to be 114. A rule of thumb for SEM is sample size should be 100 for the models containing five or fewer constructs, each with more than three observed variables and with high item communalities 0.6 or higher (Hair, 2010). As the measurement and structural model used in this survey had four constructs, each with more than three observed variables and communalities (diagonal values of the correlation matrix, Table 4 Correlation matrix) were higher than 0.6, the sample size was satisfactory. Cluster-sampling technique was used because respondents was MBA students' having Dell laptop computers.

In addition, an adapted questionnaire was used for data collection via 9 point multi-item scale was used intended to collect preference data for choosing a laptop computer brand. From these preference data a Contour Plot was derived.

The contour plot depicts the regions corresponding to the various preference consensus levels on a chart whose axes are the same as the preference map. XLSTAT version 2013.5.03 software was used for preference data analysis.

An adapted scale was used to measure the effect of brand communications on brand equity dimensions. For example, brand communications were measured via 6 items from Holbrook and Batra's (1987) along with Bansal and Voyer's (2000) scales. Brand awareness and associations were measured via 6 items from Rossiter's et al., (1987) scale. Perceived quality was measured via 3 items from Dodds's et al., (1991) scale. Brand Loyalty was measured via 3 items from Beatty and Kahle's (1988) scale. Brand Equity was measured via 3 items from Yoo and Donthu's (2001) overall brand equity scale.

Finally, in this study, to examine the effects of brand communications on brand equity dimensions, a multivariate technique Structural Equation Modeling was used. SEM consists of two model- 1) measurement model, and 2) structural model. At first, the measurement model was tested then structural model was tested. Then, reliability and validity was assessed by cronbach alpha, convergent validity and discriminant validity. Popular software AMOS20 and SPSS 17 were used for multivariate data analysis.

Data collection was limited to business students of Dhaka University only and the sample size was 114. The taste and preference levels of public university students' may differ from private university students. Therefore, it is suggested that the key constructs should be further explored and compared across universities and colleges in order to tailor specific brand for specific segment.
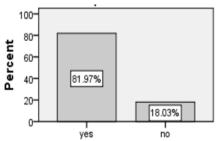
FINDINGS AND ANALYSIS

The objectives of this study were to identify students' favorite brand for laptop computers, determine the preferred attributes for choosing that brand and examine the effects of brand communications on brand equity dimensions. To fulfill these tasks, keeping in view the cost and time considerations, this study selects to analyze only eight laptop brands and ten attributes for laptop computers. In addition to, four types of communication avenues were used for examining their impact on brand equity dimensions.

Most Favorite Laptop Computer Brand (Illustrated by SPSS outputs)

In order to identify the most favorite campus brand total 300 students of Faculty of Business Studies, University of Dhaka was interviewed. Figure 1 shows that among them 82% students have laptop computers and 18% do not have any computer. In addition to, Figure 2 shows 72% users are male and 28% are females.

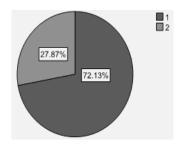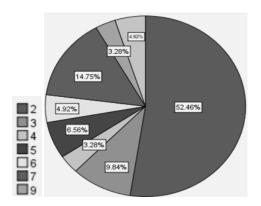**Figure 1: Percentage of the Laptop Owner   Figure 2: Gender of the Respondents**

Figure 3: Results of Frequency Charts for Laptop Brand with Percentage

Brand Name	Per (%)
2- HP	3.28%
3-DELL	52.46%
4-ASUS	14.75%
5-ACER	6.56%
6-LENOVO	3.28%
7-TOSHIBA	4.92%
8-SAMSUNG	9.84%
9-FUJITSU	4.92%

From the figure 3, it is noted that Dell is ranked first among other laptop brands. Dell has 52.46% users in Dhaka University, campus. So, students' favorite campus brand for laptop computer is Dell.

The Attributes of Most Preferred Laptop Computer Brand

As noted earlier, product attributes signals the quality of a product. Likewise the quality and the favorability of a laptop computer solely depend on its attributes. Preference data was collected from 114 or 52.46% Dell laptop users.
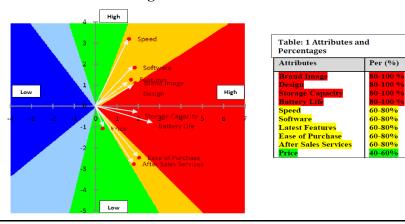
Figure 4: Contour Plot

Figure 4 shows students' preferred attributes and preference levels for choosing Dell. Red color indicates the highest preference, yellow and green colors point out respectively the second and third highest levels of preference. From that Table 1 demonstrates that students held 80 to 100% preference for brand image, design, storage capacity and battery life attributes. Besides, speed, software, latest features set, ease of purchase and after sale services got 60 to 80% preference. Finally, price got 40 to 60% preference. Above all, among university students moderate featured and reasonably priced laptops are highly preferred. That why, they choose Dell as their favorite laptop brand.

The Effect of Brand Communications on Brand Equity Dimensions

As stated earlier, Brand equity is seen as the result of long-term marketing efforts in order to build long-lasting competitive advantages. In this research the effect of four types of communication mix on brand equity dimension are examined.
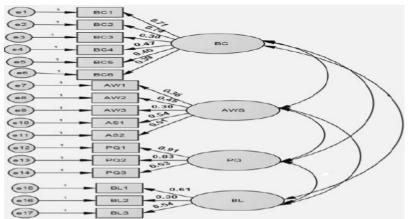
Figure 5: Measurement Model (Showing the Values of Loadings)

Legend, BC = Brand Communications, AWS = Brand Awareness and Associations, PQ = Perceived Quality, BL = Brand Loyalty

Actually, the measurement model depicts how the observed (represented by squares) variables represent constructs (represented by ovals) (Malhotra, 2010). In the figure 5 depicts the resulting measurement model showing standardized loadings. Four- factor measurement model is set up to validate the scales (Table 2 and 4) and a confirmatory factor analysis is conducted to test the measurement model.

All the values of the standardized loadings of the measurement model (Figure 5) are significant. By increasing the sample size the value of the standardized loadings can be increased. The general guideline for identifying significant factor loadings based on sample size is 0.50 for sample size 100 (Hair et al; 2010). However, the value below 0.30 used to be insignificant. Therefore, the observed variables are significantly representing constructs of this model. In the case of brand communications (BC), it is noted that advertising (BC1), promotions (BC2), friends (word-of-mouth) (BC4) are influencing factor in the purchase decisions of the respondents rather than other communication avenues. (Table 3 Psychometric Properties of Measurement Model). Overall, constructs are correctly represented by the observed variables.

Table 2: Model Fit Summary

Goodness - of - Fit Statistics (Measurement Model)	
Degrees of Freedom = 113	NFI[2] = 0.65
χ^2 = 223.67 (P = 0.000)	CFI = 0.78
GFI = 0.83	TLI[3] = 0.74
AGFI[1] = 0.76	PGFI[4] = 0.62
RMSEA = 0.08	PARITO[5] = 0.83

Table 2 shows the goodness-of-fit statistics of the measurement model (Figure 5). The fit of the measurement model is evaluated based on three different indices; comparative fit index (CFI), goodness-of-fit index (GFI), and root mean square error of approximation (RMSEA). The results indicated that the model fit the data quite well, the value of chi-square ($\chi 2$) 223.67 is significant at 0.00 probability level with 113 degrees of freedom. Specifically, CFI is found to be 0.78, GFI is 0.83, adjusted goodness-of-fit index (AGFI)is 0.76, normed-fit index (NFI)is 0.65, tucker lewis index (TLI)is 0.74, parsimony goodness-of-fit index (PGFI)is 0.62, parsimony ratio (PARITO)is 0.83 and RMSEA is 0.08 all values are fall within the acceptance level.

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[1] Adjusted Goodness-of-Fit Index
[2] Normed-Fit index
[3] Tucker Lewis Index
[4] Parsimony Goodness-of-Fit Index
[5] Parsimony Ratio

Measurement Model Reliability and Validity

In addition to model data fit, the psychometric properties (Table 3) of the scales, and coefficient alpha or cronbach's alpha reliability (Table 4) is examined.

Table 3: Psychometric Properties of Measurement Model

	Paths		Loadings
My neighbors influenced my ideas about my brand. (BC6)	←	BC	.388
My family members influenced my ideas about my brand. (BC5)	←	BC	.403
My friends influenced my ideas about my brand. (BC 4)	←	BC	.470
I like the publicity of my brand. (BC3)	←	BC	.302
I like the promotions of my brand. (BC2)	←	BC	.737
I like the advertising of my brand. (BC1)	←	BC	.712
I can quickly recall the logo of my brand. (AS2)	←	AWS	.514
Some characteristics of my brand come to my mind quickly. (AS1)	←	AWS	.539
I am aware of my brand. (AW3)	←	AWS	.304
I can recognize my brand among other competing brands. (AW2)	←	AWS	.445
The brand name of my brand tells a lot about the service. (AW1)	←	AWS	.363
The likelihood that my brand is reliable is very high. (PQ3)	←	PQ	.528
The likelihood that my brand would be functional is very high. (PQ2)	←	PQ	.830
The quality of my brand is high. (PQ1)	←	PQ	.905
If another brand is not different from my brand in any way, it seems smarter to purchase my brand. (BL3)	←	BL	.539
I will not buy other brands if my brand is available at the same store. (BL2)	←	BL	.301
I consider myself a loyal to my brand. (BL1)	←	BL	.610

Table 4: Measurement Model: Correlation Matrix (SPSS output), Average Variance Extracted and Construct Reliability

	BC1	BC2	BC3	BC4	BC5	BC6	AW1	AW2	AW3	AS1	AS2	PQ1	PQ2	PQ3	BL1	BL2	BL3	AVE	Construct Reliability
BC1	.733																	0.54	.739
BC2	.468	.711																0.51	.739
BC3	.009	.068	.537															0.29	.768
BC4	.201	.026	.114	.726														0.53	.735
BC5	.037	.010	.109	.364	.660													0.44	.745
BC6	.059	.168	.099	.036	.208	.670												0.45	.754
Aw1	.123	.167	.176	.206	.073	.028	.536											0.29	.754
Aw2	.074	.051	.088	.073	.074	.215	.287	.615										0.38	.753
Aw3	.045	.089	.276	.103	.107	.072	.075	.030	.606									0.37	.752
As1	.080	.008	.075	.003	.039	.077	.076	.065	.157	.792								0.63	.736
As2	.148	.017	.053	.030	.024	.087	.014	.134	.106	.017	.888							0.79	.748
PQ1	.083	.037	.111	.225	.211	.167	.234	.369	.245	.255	.184	.736						0.54	.726
PQ2	.016	.176	.135	.056	.169	.000	.192	.024	.215	.109	.041	.567	.738					0.55	.732
PQ3	.048	.012	.014	.006	.101	.149	.051	.073	.027	.169	.216	.112	.203	.779				0.61	.733
BL1	.025	.140	.056	.007	.262	.059	.089	.162	.067	.104	.022	.175	.003	.429	.792			0.63	.733
BL2	.077	.120	.174	.187	.052	.176	.247	.330	.199	.242	.021	.059	.163	.110	.039	.439		0.19	.767
BL3	.091	.266	.088	.036	.060	.179	.259	.076	.227	.304	.091	.088	.396	.080	.104	.241	.659	0.43	.744

∗ BC = Brand Communications, AWS = Brand Awareness and Associations, PQ = Perceived Quality, BL = Brand Loyalty

∗ Value on the diagonal of the correlation matrix is the square root of AVE

From the table 4, it is noted that the scale exceed the recommended cutoff value 0.6. Thus, it is reasonable to conclude that the scale is reliable.

In terms of convergent validity, it can be mentioned that all factor loadings are significant, which provide empirical support for the convergent validity of the scales.

In view of discriminant validity, the square root of the average variance extracted are larger than the correlation coefficients, indicate the discriminant validity of the scale for this study.

Overall, the measurement model is understood to be appropriate given the evidence of good model fit, reliability, convergent validity and discriminant validity.
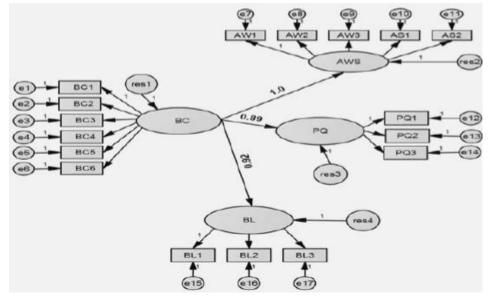
Figure 6: Structural Model (Showing the Values of Loadings)

Legend, BC = Brand Communications, AWS = Brand Awareness and Associations, PQ = Perceived Quality, BL = Brand Loyalty

In fact, the structural model shows how the constructs are interrelated to each other, often with multiple dependence relationships (Malhotra, 2010). It specifies whether any relationship exists among variables. From figure 6 based on theoretical considerations, it can be hypothesized that brand communications have a direct and positive impact on brand equity dimensions- brand awareness & associations (AWS); perceived quality (PQ) and brand loyalty (BL). All the values shown in figure 6 are significant and in the expected direction. Therefore, it is proved that brand communications have direct and positive impact on brand awareness & associations; brand loyalty and perceived quality.

Table 5: Model Fit Summary

Goodness - of –Fit Statistics (Structural Model)	
Degrees of Freedom = 116	NFI = 0.57
χ^2 = 277.10 (p = 0.000)	CFI = 0.68
GFI = 0.79	TLI = 0.63
AGFI = 0.72	PGFI = 0.60
RMSEA = 0.08	PARITO = 0.85

Table 5 shows the goodness-of-fit statistics of the structural model (Figure 5). The results indicated that the model fit the data quite well the value of chi-square 277.10 is significant at 0.00 probability level with 116 degrees of freedom.

Specifically, CFI is found to be 0.68, GFI is 0.79, AGFI is 0.72, NFI is 0.57, TLI is 0.63, PGFI is 0.60, PARITO is 0.85 and RMSEA is 0.08. Collectively, these fits indicate that the structural model is acceptable.

Structural Model Validity

Table 6: Loadings and Variance

Paths			Loadings	Variance
PQ	←	SBC	0.89	0.79
AWS	←	SBC	1	1
BL	←	SBC	0.92	0.88

Table 6 illustrates the value of the loadings and variances. The loading for perceived quality is 0.89 which indicates that brand communications explain 0.79% of the variance in perceived quality, next 1% in brand awareness with associations then 92% in brand loyalty. All these values are significant.

CONCLUSION

The findings prompt a number of practical recommendations for marketers of laptop computer brands. In determining consumers' preferred attributes and their ratings for choosing a laptop computer brand, it is found that medium standard/ featured and rationally priced laptop computers are preferred by university students. Because students' budgets are limited and as they are not professional they do not need high performing or highly featured expensive laptops. In examining the various communication avenues with regard to their effect on brand equity dimensions, it is found that certain types of communication avenues that is advertising, promotions and word-of-mouth (friends' reference) are more effective in enhancing brand positive consumer response. Marketers of laptop computer should spend more on these three types of communication avenues to elicit positive consumer outcome.

REFERENCES

Aaker, D. A. (1991). *"Managing Brand Equity: Capitalizing on the Value of a Brand Name"*, New York: Free Press.

Aaker, D. A. (1996). *"Managing Brand Equity Across Products and Markets"*, California Management Review, Vol. 38, pp.102-120.

Bangladesh Economic Review (2012). *"Human Resource Development"*, Chapter 12, Bangladesh Government Press, Tejgaon, p.208.

Bangladesh Economic Review (2012). *"Poverty Alleviation",* Chapter 13, Bangladesh Government Press, Tejgaon, p.240.

Bansal, H. and Voyer, P. (2000). "Word-of-mouth Processes within a Services Purchase Decision Context", *Journal of Service Research*, Vol. 3, No. 2, pp.166-77.

Batra, R., Aaker, D. A. and Myers, G. J. (1995). *"Advertising Management",*5th Sub Edition. Prentice Hall.

Beatty, S. E. and Lynn, R. K. (1988). "Alternative Hierarchies of the Attribute-Behavior Relationship: The impact of Brand Commitment and Habit", *Journal of Academic Marketing Science,* Vol. 16, pp.1-10.

Berry. L .L. (2000). "Cultivating Service Brand Equity", *Journal of the Academy of marketing Science,* Vol. 28, No. 1, pp.128-137.

Chen, C, F. and Tseng, W. S. (2010). "Exploring Customer-based Airline Brand Equity", *Taiwan Transportation Journal,* Vol. 49, No. 11, p.29.

De Bruyn, A. and Lilien, G. (2008). "A Multi-stage Model of Word of Mouth inflUence: Through Viral Marketing", *International Journal of Research in Marketing,* Vol. 25, Iss. 3, pp.151-163.

Delvecchio, D. Henard, D. H. and Freling, T. H. (2006). "The Effect of Sales Promotion on Post-promotion Brand Preference: A Meta-analysis", *Journal of Retailing,* Vol. 82, pp.203-213.

Dodds, W. B., Kent, B. M. and Dhruv, G. (1991). "Effects of Price, Brand, and Store Information on Buyers' Product Evaluation", *Journal of Marketing Research,* Vol. 28, pp.307-319.

Erenkol, A. D. and Duygun, A. (2010). "Customers' Perceived Brand Equity and a Research on the Customers of Bellona which is a Turkish Furniture Brand", *The Journal of American Academy of Business,* Vol. 16, No. 1.

Greenbaum, M. (2006). "Creating Dynamic Brand Awareness", *Franchising World,* Vol. 2, No. 1, pp.46-48.

Hair, J. F Jr., Anderson, R. E., Tatham, R. L. and W. C. (2010). *"Multivariate Data Analysis",*7th Edition, Prentice-Hall, Upper Saddle River, New Jersey.

Holbrook, M. B. and Batra, R. (1987). "Assessing the Role of Emotions as Mediators of Consumer Responses to Advertising", *Journal of Consumer Research,* Vol. 14, pp.404-420.

Huang, R. and Sarigóllù, E. (2011). "How Brand Awareness Relates to Market Outcome, Brand Equity, and the Marketing Mix", *Journal of Business Research,* pp.7-136.

Jedidi, K., Mela, C. F. and Gupta, S. (1999). "Managing Advertising and Promotion for Long-Run Profitability", *Marketing Science*, Vol. 18, No. 1, pp.1-22.

Keller, K. L. (1993). "Conceptualizing, Measuring and Managing Customer-based Brand Equity", *Journal of Marketing,* Vol. 57, No. 1, pp.1-22.

Keller, K. L. (2008). *"Strategic Brand Management: Building, Measuring, and Managing Brand Equity",* 3rd Edition, Pearson Education, Inc., in South Asia.

Kotler, P. and Keller, K. L. (2006). *"Marketing Management",* 12th Edition, Pearson Education, Inc., Upper Saddle River, New Jersey.

Kotler, P. H. (1991). *"Marketing Management: Analysis, Planning and Control",* 8th Edition, Englewood Cliffs, NJ: Prentice-Hall.

Kotler, P. H. and Armstrong, G. (1996). *"Principles of Marketing",* 7th Edition, Prentice-Hall.

Krishnan, H. S. and Diipankar, C. (1993). *"Varieties of Brand Memory Induced by Advertising: Determinants, Measures, and Relationships",* In David A. Aaker and Alexander L. Biel (Eds.). Brand Equity and Advertising: Advertising's Role in Building Strong Brands (pp.213-231). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Lim, B. C. and Chung, M. Y. (2011). "The Impact of Word-of-mouth Communication on Attribute Evaluation", *Journal of Business Research,* Vol. 64, pp.18-23.

Malhotra, N. K. and Das, S. (2010). *"Marketing Research: An Applied Orientation",* 6th Edition, Pearson Education in South Asia.

Marconi, J. (1999). *"The Complete Guide to Publicity- Maximize Visibility for Your Product, Service, or Organization",* Lincolnwood, Ill: NTC Business Books.

Marinova, S., Cui, J., Marinov, M. and Shiu, E. (2011). "Customers Relationship and Brand Equity: A Study of Bank Retailing in China", *WBC,* Poznau, pp.6-9.

Mazzarol, T., Sweeney, J. C. and Soutar, G. N. (2007). "Conceptualizing Word-of-mouth Activity, Triggers and Conditions: An Exploratory Study", *European Journal of Marketing,* Vol. 41, Issue 11/12, p.1475.

McClary (2006). *"An Evaluation of Consumer Buying Criteria and its Impacts on the Purchase of Commoditized Laptops",* Capella University, Dissertation, December, 2006.

Ministry of Finance (2013). Retrieved on December 04, 2013 from <http://www.mof.gov.bd>.

Murphy, J. M. (1992). "What is Branding? In J.M. Murphy (Ed.)", Branding A Key Marketing Tool (pp.1-12). London: Macmillan.

Nelson, O. (2010). "Celebrity Advertising and its Effectiveness on Brand Loyalty", *Interdisciplinary Journal of Contemporary Research in Business,* Vol. 1, No. 9.

Oliver, R. L. and Berger, P. K. (1979). "A Path Analysis of Preventive Care Decision Models", *Journal of Consumer Research,* Vol. 6, pp.113-122.

Rossiter, J. R. and Percy, L. (1987). *"Advertising and Promotional Management",* New York: McGraw Hill.

Shih, T. Y. (2010). "Comparative Analysis of Marketing Strategies for Manufactures' and Retailers' Brands", *International Journal of Electronic Business Management,* Vol. 8, No. 1 (November), pp.56-57.

Tech World (2013). Retrieved on November 04, 2013 from <http://www.techworldbd.com>.

Tech World Bangladesh (2013). *"Internship Opportunity at Microsoft Bangladesh",* Vol. 3, Issue 3 (November), pp.82.

Tech World Bangladesh (2013). *"Asia will Control 40% of World Economy by 2020",* Vol. 3, Issue 3, pp.63.

Tech World Bangladesh, (2013). *"Government's Project to Offer Job for 400 Fast Track IT Leaders",* Vol. 3, Issue 3 (November), pp.48.

Tong, X. and Hawley, J. M. (2009). "Measuring Customer-based Brand Equity: Empirical Evidence from the Sportswear Market in China", *Journal of Product and Brand Management,* Vol. 18, No. 4, pp.262-271.

Top Ten Laptop Reviews (2013). Retrieved on November 04, 2013 from <http:// laptops.toptenreviews.com>

Xu, J. B. and Chen, A. (2010). "A Conceptual Framework of Hotel Experience and customer-based brand Equity", *International Journal of Contemporary Hospitality Management,* Vol. 22, No. 2, pp.174-193.

Yoo, B. and Donthu, N. (2001). "Developing and Validating Multidimensional Consumer-based Brand Equity Scale", *Journal of Business Research,* Vol. 52, No. 1, pp.1-14.

Yoo, B. Donthu, N. and Lee, S. (2000). "An Examination of Selected Marketing Mix Elements and Brand Equity", *Academy of Marketing Science journal,* Vol. 28, No. 2, pp.195-211.

Zeithmal, V. (1988). "Consumer Perception of Price, Quality and the Value: A Mean-end and Synthesis of Evidence", *Journal of Marketing,* Vol. 52, No. 2, pp.2-22.