



## EXPLORATORY FACTOR ANALYSIS FOR E-COMMERCE MARKETING STIMULI FACTORS

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### ABSTRACT

*In this Digitalized era, doing business in an 'E-Commerce way' have become a fashion and also a compulsion for any business activity. E-Commerce keeps certain business bottlenecks away as, they are more digitalized, more live, real-time, speed and easy accessibility. During the last two decades, digital information flow is continuous and it becomes more important in business transactions. Marketing research results become a strategic advantage for the marketers. Hence, the need for market research is on the rise with regard to the online platform. Strategies differ from conventional marketing to online marketing. Knowing the pattern of the consumer behavior has become vital for every researcher, and to test everyone is in need of a standardized instrument to collect right data. This paper is focused to find the important factors that influence E-Commerce marketing stimuli factors. By applying Exploratory Factor Analysis (EFA), clustering of the factors are identified and found suitable for the identified factors.*

**Key words:** E-Commerce, Business Transactions, EFA and Marketing factors.

## **Introduction**

Electronic commerce is generally considered to be the sales aspect of E-business. It also consists of the exchange of data to facilitate the financing and payment aspects of business transactions. This is an effective and efficient way of communicating within an organization and one of the most effective and useful ways of conducting business. It is a market entry strategy where the company may or may not have a physical presence. The terms “e-commerce” and “e-business” both refer to the way the internet can be used to do business and can offer your business huge opportunities in the global marketplace. In present scenario of Marketing, it is a decisive question that the customer choices are created from the marketer’s front or from the customers need based. But either of the case may be the purchase decisions differ extensively. Ecommerce presents countless opportunities for retailers and brands, so businesses seeking to take advantage of the benefits must also address some tough decisions — site design, mobile and social media strategies, customer service and product pricing, to name a few.

## **E-Commerce Marketing Stimuli**

It takes six to ten "touches" before consumers buy a brand. Today's customers are experiencing your product or service across platforms — from mobile, Web, physical, media and referral sources. A customer may first experience your brand from a personal referral, but then may explore on mobile or a tablet before doing a deep dive on the Web. After those experiences, they may review on a third-party site before going in-store to purchase. That cross-platform, pre-purchase experience requires a 360-degree view of the customer to ultimately complete the sale. Think holistically about how a consumer experiences across platforms. Thinking holistically, makes a marketer to develop strategies that influence the customer temptations to buy. This paper identifies three broad classification of strategies such as Web store quality, product display, pricing and promotion offers. Each factor has different variables for with EFA results prove that the factors are stimuli creation factors. This paper attempts to fill the gap that the researchers did not come across any of the marketing stimuli frameworks.

## **Review of Literature**

**AK Tyagi, PK Agarwal (2012)**<sup>1</sup> in this paper, a study online buying behavior Indian context. Objective of the study was to identify the factors which influence the online shopping

behavior. 300 samples were collected for study 70% of the customers say that the promotion offers of the E-Commerce web site and Design of the Web site for 28% were the reasons for online purchase.

**Jadhav, V., & Khanna, M. (2016)<sup>2</sup>** Factors Influencing Online Buying Behavior of College Students objective of the study is find out factors influencing the online buying behavior of the college students. 25 sample were taken by convenient sampling method and qualitative content analysis were used for find out objectives form the result major factors influencing the online buying behavior of the college students are availability, low price, promotions, comparison, convenience, customer service, perceived ease of use, attitude, time consciousness, trust and variety seeking.

**Zhou & Gu, (2015)<sup>3</sup>** “The Effect of Different Price Presentations on Consumer Impulse Buying Behavior: The Role of Anticipated Regret” researchers try to find out impact of different price promotion incentive on consumer impulse buying intention. Sample size was 340 and ANOVA used as a statistical tool for analysis. It was finding that price presentation have a significant impact over impulsive buying intention.

**Lin & Lin, (2013)<sup>4</sup>** Buying impulse triggered by digital media titled study try to find out consumers’ positive feeling and impulsive buying after receiving digital media promotion of limited-time offer and situation like more money available. Sample size was 324 and Structural Equation Modeling used for analysis, the results indicated that consumers generate more positive affect if they perceive less time pressure or more money available. The results also discovered the direct effect of user positive affect and impulse buying tendency on their felt urge to buy.

### **Objectives of the Study**

- To find the variables that has close association with regard to E-Commerce marketing stimuli factors.
- To understand the percentage of variance explained by each factor in E-Commerce marketing stimulus.

## **Research Methodology**

The nature of the research is descriptive as the objective of the study is to find out which are the variables to group together to form a factor with regard to the E-Commerce marketing stimuli factors. The study was conducted within the limits of the Coimbatore district and by applying convenient sampling method, the researcher collected data of about **298** samples. The questionnaire is developed using, 29 continues scale questions. Nominal scale includes personal information data, such as age, gender, educational qualification and designation. Continues scale questions includes about the quality of the web store, description about the web store and their promotional aspects. Five point Likert's scale was used to rate opinion of online customers.

Sample size is calculated for running Exploratory Factor Analysis based on the assumption of (Worthington & Whittaker, 2006)<sup>5</sup>. A good practice is to have a sufficient sample size so that the participant to item ratio is greater than 5 to 1, preferably closer to a ratio of 10 to 1. In this regard, 29 likert scale questions were used so  $29 \times 10 = 290$ . 320 questionnaires were distributed only 298 eligible questionnaires were used for the study.

## **Analysis and Findings**

Exploratory Factor Analysis was used for analyzing the objectives.

### **Exploratory Factor Analysis**

Exploratory Factor analysis is a special form of factor analysis. It is used to assess the number of factors and the loadings of variables. A principal components exploratory factor analysis with varimax rotation was performed on the original 29 items in the attributes. E-Commerce marketing stimuli factors (Child, D. 1990)<sup>6</sup>.

Principal components factor analysis is a statistical technique that transforms data from one set of variables into a smaller set of uncorrelated factors. An orthogonal varimax rotation was conducted because it maximizes the amount of variance described by a factor and minimizes the correlation between factors. Factor analysis is often used in data reduction to identify a small number of factors that explain most of the variance that is observed in a much larger number of manifest variables. Factor analysis can also be used to generate hypotheses regarding causal

mechanisms or to screen variables for subsequent analysis (for example, to identify the colinearity prior to performing a linear regression analysis).

Seven methods of factor extraction are available. Five methods of rotation are available, including direct Oblimin and Promax for non -orthogonal rotations. Three methods of computing factor scores are available, and scores can be saved as variables for further analysis.

Sampling adequacy of the data is evaluated on the basis of the results of Kaiser-Meyer-Olkin (KMO) (Table No: 1) measure of sampling adequacy (Kaiser HF.1974)<sup>8</sup> and Bartlett's test of Sphericity<sup>7</sup> (Homogeneity of Variance).

| <b>Table No: 1- KMO and Bartlett's Test</b>      |                    |             |
|--|--------------------|-------------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. |                    | 0.83506     |
| Bartlett's Test of Sphericity                    | Approx. Chi-Square | 5918.18     |
|  | df                 | 435         |
|  | <b>Sig.</b>        | <b>0.00</b> |

High value of KMO (0.835 > .5) of indicates that a factor analysis is useful for the present data. The significant value of Bartlett's test of Sphericity is 0.000 and is less than .05 which indicates that there exist significant correlations among the variables to proceed with analysis (J hair. 1995)<sup>10</sup>. The resultant value of KMO test and Bartlett's test indicates that the present data is useful for factor analysis.

Total variance explained the actual number of factors that can extracted on the basis of cut of criterion (Extraction Method) (Williams, Brown & Onsmann, 2012)<sup>11</sup>, in this case, we used Eigen value one. Those factors its Eigen value is above or equal to one consider as a significant factor. **The % of Variance** column tell how much of the total variability can be accounted for by each of these Factors.

| <b>Table No: 2- Total Variance Explained</b> |                             |                      |                     |  |                      |                     |
|--|-----------------------------|----------------------|---------------------|--|----------------------|---------------------|
| <b>Component</b>                             | <b>Initial Eigen values</b> |                      |                     | <b>Rotation Sums of Squared Loadings</b> |                      |                     |
|  | <b>Total</b>                | <b>% of Variance</b> | <b>Cumulative %</b> | <b>Total</b>                             | <b>% of Variance</b> | <b>Cumulative %</b> |
| 1  | 6.110                       | 30.340               | 30.340              | 4.244                                    | 15.100               | 15.100              |
| 2  | 3.149                       | 17.600               | 28.000              | 3.732                                    | 32.500               | 43.240              |
| 3  | 1.998                       | 10.400               | 58.340              | 3.280                                    | 10.740               | 58.340              |

The factor analysis result shows that all the 29 questions can be grouped into three variables. All this three factors explains E-Commerce marketing stimulus by 58.34% variance, which is significant. This means the total variables can be grouped in to three variables.

| <b>Table No: 3 - Rotated Component Matrix</b> |                  |          |          |
|---|------------------|----------|----------|
|   | <b>Component</b> |          |          |
|   | <b>1</b>         | <b>2</b> | <b>3</b> |
| webqual_1                                     | 0.644            |          |          |
| webqual_2                                     | 0.627            |          |          |
| webqual_3                                     | 0.598            |          |          |
| webqual_4                                     | 0.596            |          |          |
| webqual_5                                     | 0.592            |          |          |
| webqual_6                                     | 0.580            |          |          |
| webqual_7                                     | 0.535            |          |          |
| webqual_8                                     | 0.513            |          |          |
| webqual_9                                     | 0.510            |          |          |
| webqual_10                                    | 0.475            |          |          |
| webqual_11                                    | 0.450            |          |          |
| webqual_12                                    | 0.441            |          |          |
| prodis_1                                      |                  | 0.719    |          |
| prodis_2                                      |                  | 0.649    |          |
| prodis_3                                      |                  | 0.631    |          |
| prodis_4                                      |                  | 0.619    |          |

|  |  |       |       |
|--|--|-------|-------|
| prodis_5   |  | 0.560 |       |
| prodis_6   |  | 0.539 |       |
| prodis_7   |  | 0.505 |       |
| prodis_8   |  | 0.492 |       |
| pricepromo_1   |  |       | 0.752 |
| pricepromo_2   |  |       | 0.675 |
| pricepromo_3   |  |       | 0.652 |
| pricepromo_4   |  |       | 0.622 |
| pricepromo_5   |  |       | 0.521 |
| pricepromo_6   |  |       | 0.519 |
| pricepromo_7   |  |       | 0.503 |
| pricepromo_8   |  |       | 0.480 |
| pricepromo_9   |  |       | 0.472 |
| <i>Extraction Method: Principal Component Analysis.</i>    |  |       |       |
| <i>Rotation Method: Varimax with Kaiser Normalization.</i> |  |       |       |
| <i>a. Rotation converged in 15 iterations.</i>             |  |       |       |

**Source: Primary Data**

The Rotated Component Matrix shows the factors loading for each variable and total variance accounted for, by all the three factors with Eigen value greater than 1 is 58.34% and the remaining least variance is explained by other variables. Among the ten factors, the first factor accounts for around **30.34%** of variance which is the highest variance explained by a single factor. Using varimax rotation factors analysis identified underlying variables, or factors, that explain the pattern of correlations within a set of observed variables.

**E-Commerce marketing stimuli factors like Web store quality with twelve questions, Product display by eight and Pricing promotion with nine questions.**

**Web store quality is the first marketing stimuli factor**, that explained 30.34% variance of E-Commerce marketing stimuli with 12 questions such as, personalization and customization, mail regarding pricing and promo offers, easy payment mode & process, purchase branded and high value products from selected web stores, branded online shopping sites, promotion offers in regular web stores induces for immediate purchases, choose the web stores with customer

service, prefer prompt delivery, immediately responds when return the purchased, purchase experience develops trust and credibility, recommend a web store or an offer after purchase deal are found satisfied.

**Product display is the second factor**, explains 17.60% variance of E-Commerce marketing stimuli with 8 questions such as the products displayed in the web attract, check for the quality and specifications of product, Compare product features in different web stores, check for availability of colors & size before ordering, check for availability of colors & size before making purchase, buy things which are trendy in sight, never felt that one could not touch and feel the product, Display in the website specification, “the color displayed in webpage may vary” stops one in making a purchase.

**Pricing promotion is the third factor that**, explains 10.40% variance of E-Commerce marketing stimuli with 9 questions such as check for the price of the product with that of the regular store, compare the price of a product from one web site to the other, watch daily deals in some familiar web sites, tempted to buy immediately when I see great deal or discount offers, buy things in case of personalized pricing offers, even if I don't have any need, attracted by Buy one get one free, discount offers and daily deals, buy things if free shipping or shopping discount on the web store, order when I view seconds /minutes left deals. Hence, the EFA results, clusters the factors into three different variables to test the strongest marketing stimuli factors to understand the consumer opinion with regard to the online shopping behavior.

## **Conclusion**

To conclude that, the same factors may be tested with different geographical area, or with different cluster of the respondents to prove the validity part of the factor results for e-commerce marketing stimuli factors. The variables of the study are made based on the giant online web stores under consideration. The marketing stimuli factors may differ from exclusive company sites to that of e-stores like Amazon or Flipkart. It may also differ with different cluster of the respondents.

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