Information Overload on E-commerce

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Abstract. In on-line purchases process, the consumer can experience the information overload state. This paper deals about the affective answers of the customers of e-commerce to this phenomenon, which represents the behavior of the consumer on influence of an exceeding number of information its capacity of individual processing. The adopted methodology had an exploratory-descriptive character. The first phase has used a qualitative perspective, resulting in the construction of the scale used in this study. The second part, a survey was conducted, and its objective was to verify opposing theoretical relations from searched literature. In this way, multivariate statistics techniques had been used, with prominence in the structural equations modeling. The conclusions had indicated that the theory of information overload for traditional commerce is partially valid for e-commerce and the premise that the confusion feeling is the predictor of the satisfaction level reduction of the consumers under influence of the information overload is deconstructed.

1 Introduction

The academy has developed an increasing and significant interest over e-commerce on the last decade, due to the way consumers behave while facing the diverse online shopping activities [1]. The importance given to e-commerce is the result, mainly, of the development of commercial relations done through this channel [2].

Internet provides comfort and commodities that are attractive to clients, such as the convenience and agility on information search and the amount of precious information found in a short period of time [3]. The quickness on

communication can turn the decision making process more agile and facilitate the purchase.

Currently, companies offer a great variety of products and brands. They vary on size, shape, color, among others distinctions. Many researchers indicate that this huge amount of offer of alternatives causes on consumers the experience of information overload [4].

Information overload is defined as negative affective effect caused by the surplus of information in addition to the ´consumer's individual processing capacity [6].

This way, considering the content discussed, the problem to be investigated is defined on the question: in which way the affected responses resultant from information overload relates with consumer's behavior on electronic commerce?

The understanding of the information overload phenomena implies on a new project perspective for commercial websites. Having these answers, virtual stores will be able to manage the amount of information in a way to avoid causing negative impacts on consumers.

2 Information Overload

During the information search process, individuals are exposed to experiment the information overload state, which represents the consumer's behavior under the influence of a grater amount of information than he is capable of processing [5].

Jacoby and Malhotra [7] and Sheth [1] defines the overload state as the condition of being exposed to a plethora of information in a way that a person cans no longer process.

Previous research investigated the information overload as a negative affect experience (confusion/reduction of levels of satisfaction) caused by the huge amount of alternatives and attributes provided on the moment of purchase [5].

According to the theoretical revision made, two affective reactions are pointed as the result of information overload experience, reduction of satisfaction level [8] and confusion [5].

The e-commerce is much more than just the online shopping and selling of products. In fact, it involves the online process of development, marketing, selling, delivery and payment of products and services negotiated with clients from the interconnected global market, with the support of a worldwide network of partners [9].

The competence of the electronic commerce sites includes characteristics such as customizing of WebPages for shoppers and the configuration of products in real time [10]. The understanding of the information overload effects is particularly important on the construction of websites, since the amount of information available for the consumer on the moment of purchase is a determinant factor for the information overload experience.

The next section will discus the method adopted for this study.

3 Methodology

This study has a descriptive-exploratory character, since initially a deeper theoretical knowledge of the constructs investigated is desired, with the objective of describing them next in terms of purchases done through the electronic commerce, with emphasis on the variables that are of interest of this study.

On the first phase, exploratory, the literature is investigated, aiming the structure of theories related to e-commerce and information overload.

The second step, descriptive, a survey was developed through the application of questionnaires elaborated based on information gathered by the bibliographical review and by the structuring of theoretical reference. The scales were developed based on the literature, so that the objective of this study could be reached.

Hair *et al* [11] states that for the use of structural equations modeling is necessary a minimum sample of 50 respondents. This study gathered 57 valid questionnaires.

From de desk research done, some hypotheses were developed to be tested on this study, as can be observed on Table 1.

Table 1. Hypotheses

	Hypotheses	Source
H0	Consumers of e-commerce are not influenced by the information overload.	
H1	The information overload generates an affective response of confusion on e-commerce consumers.	Jacoby *et al* [5] Scammon [8]
H2	The information overload generates the reduction of the satisfaction level of e-commerce consumers.	Malhotra [12] Keller and Staelin [13]

The exploratory phase, which used desk research, culminated on the elaboration of a research instrument used on this study. The next section describes the analysis of the research.

4 Analysis and Results

The first step of the data analysis was a respondents´ profile survey. The sample was composed by 64% of male, with average age of 35 years old and personal average income up to 06 minimum wages.

The main products bought were books (14%), digital cameras (9%) and CD's (9%). The purchases´ average price was US$ 240.00. Two items (Home Theater, and notebook) were identified having their price higher up from US$ 1,000.00, and other two (video game and LCD Television) having superior price from the amount of US$ 1,500.00.

When questioned about the information sources, consumers had affirmed, relating offline and online information, that they consult twice as time the first option (friends and relatives, traditional store, printed catalogues, television advertising, outdoors, and radio) than the second one (manufacturer's site,

salesman and research sites). This finding has contradicted the expectations. Researchers believed that the internet would be the main source of information search.

Also, the data collection instrument had measured the importance of these information sources (online and offline) in purchase decision process. Summary of this analysis can be observed in Table 2.

Table 2. Pre-purchasing Information' Sources

Information Source	Order of Importance	Information Type
Virtual Store *Website*	1º	*Online*
Manufacturer *Website*	2º	*Online*
Traditional Store	3º	*Offline*
Research *Websites*	4º	*Online*
Friends or Relatives	5º	*Offline*
Printed Catalogues	6º	*Offline*
Advertising	7º	*Offline*

The primary source of information search of daily pre-purchase is the virtual store; and the less important alternative considered in the previous moments of the purchase is the advertising (television, outdoors, and radio). Researchers believe that the reason of this result is the fact that this advertising in these specific Medias have other objectives, such as consumer mind branding fixing.

Comparing the results between the consulted sources amount, and its importance, it was observed that, although the internet is less consulted than the offline sources, it is considered as the most decisive in the electronic commerce consumers purchase decision process.

Most of the respondents (74.5%) had affirmed that they considered between 02 and 04 different alternatives during the purchase decision process. Three will be considered as the average number of alternatives in the calculation analysis.

Three attributes were identified as average during the pre-purchase. Table 3 lists the most consulted attributes informed by the respondents.

Table 3. Consult Attributes Frequency

Product Attribute	Consult Percentage
Brand	82.5%
Manufacturer	77.2%
Durability	70.2%
Size	63.2%
Color	59.6%
Weigh	57.9%
Origin	54.4%

In this analysis, it's clear that 82.5% of the consumers had analyzed the product brand before finishing the purchase.

The fact that the attributes "size" and "weight" had been analyzed by the respondents respectively 63.2% and 57.9% is an important finding. Confer to this behavior the importance that these characteristics possess, especially regarding the freightage, which is calculated based on the commodity weight.

The number of ideal information (in which the overload information experience does not occur) is between 05 and 06 [14]; therefore, the respondents of this research, analyzing all 09 information, have experienced the overload information.

The used scale was submitted to the factorial analysis technique, which objective is to analyze the internal relations between a given number of variables, and to explore the common latent factors to these items. The objective is to find a way to condense the information in a smaller number of variables (factors) with a minimum acceptable loss [11]. In order to test the scales reliability, the Cronbach's Alpha technique was done. Scales must possess the minimum reliability coefficient of 0.6 [15]. The finding indices were: KMO = 0.624; Qui-square =f 80.028; 10 Degrees of Freedom and Significance of 0.000. Table 4 represents the factor analysis results.

Table 4. Factor Analysis

Item	Factor 1	Factor 2	Alpha
I feel satisfied with my purchase	.729	-	.833
I'm sure I have made the right choice.	.931	-	
I'm happy with my choice.	.939	-	
I have felt confused during my purchase choice.	-	.519	.745
Between the brands I have conditions to buy, I did not make the best choice.	-	.582	
I believe I did not make the best choice.	-	.836	
If I had more information, I would have conditions of making a better choice between the options available.	-	.819	
I believe that more information would have caused me a bigger confusion in my choice.	-	.767	

Factor 1 is named "satisfaction" and factor 2 is named "confusion".

From the identified latent factors, a correlation matrix was developed. The *Pearson* correlation constitutes a conceptual basis for the multivariate analyses [15]. The analysis objective is to obtain a general view of the investigated variables relationship, as it's shown in Table 5.

Table 5. Correlation Matrix

Variables	Satisfaction	Confusion	Information Quantities
Satisfaction	1	-,455**	-,336*
Sig.		,001	,014
Confusion	-,455**	1	-,110
Sig.	,001		,463

It's clear that satisfaction possess negative relation with the amount of information and the confusion. This result corroborates with the information overload literature, which points to these affective responses as opposite [8].

The structural equations modeling is a statistic model which looks to explain the relationship between multiple variables. This technique examines the inter-relationships structures expressed in a series of equations, similarly to a series of multiple regression equations [11].

The structural equations modeling**,** according to Hair *et al* [11], can be considered as a multiple regression extension, which the most obvious difference between it and other multivariate techniques is the way of dealing with the dependent variables joints. The variables order is the most important concern in this technique. In the regression "X" causes "Y"; MES "X" causes "Y", and "Y" causes "Z", therefore, a dependent variable becomes an independent variable in the following relationship [11].

The theoretical model developed for this research is shown bellow, in figure 1.

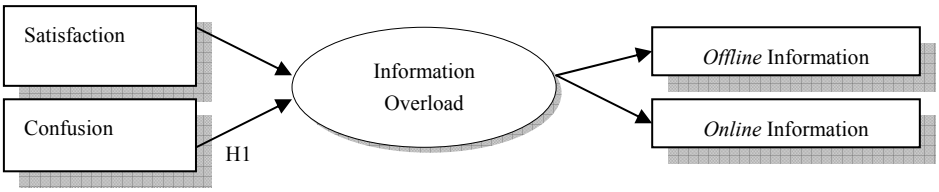

Figure 1. Theoretical Model Proposed

According to this model, the information overload is produced from the excess of online information available (manufacturer, salesperson, and search websites), and t H2 information available (friends and relatives, traditional store, printed catalogues, TV advertisement, outdoor, and radio).

Right after identifying the model components, it's necessary to calculate the adjustments indices. These indices, also known as *fit,* indicate the model internal consistence, and they must be calculated based on the observed variables number, and the quantity *N* of the sample [11]. The model adjustments indices found were: CFI (0.905), and RMSEA (0.060). The summary of the calculated estimates is represented bellow, in table 6.

Table 6. Relations Between the Model Variables

Relations	Estimative	DE	Significance
Satisfaction ←→ Confusion	-0.454	0.153	0.003
Satisfaction → Information Overload	-0.979	0.188	0.000
Confusion → Information Overload	-0.988	0.201	0.000

The finding results from the analysis of structural equation modeling indicate that consumers feel less satisfied, and less confused with the information increasing.

Therefore, the null hypothesis was denied (H0). The two other hypothesis, relating information overload with confusion (H1), and satisfaction levels reduction (H2) were respectively rejected, and confirmed.

The H2 confirmation demonstrates that, as in traditional environment, virtual environment with information overload also produces reduced consumers satisfaction levels.

The main finding in this research is on the H1 rejection. Virtual consumers did not feel confused with the information increasing, but the opposite. It's possible to affirm, based on the structural equations modeling estimates, that an information overload reduces the confusion level.

Research conclusions are held in the next section.

5 Conclusion

From the analysis it is possible to conclude that the information overload theory on traditional commerce is partially valid for electronic commerce.

It was confirmed that the surplus of information available generates a reduction of satisfaction level on consumers, corroborating with the literature [8].

The second and most relevant conclusion of this study refers to the inversely proportional relation between confusion and amount of information, which is contrary to most of the literature of information overload on traditional commerce [5].

This result not only indicates that e-commerce consumers feel less confused with the increase of the amount of information. It decomposes the idea that the reduction of satisfaction level occurs due to the confusion, a basic premise of information overload literature.

The analysis suggests that even the concept of the phenomena studied can be decomposed on the e-commerce perspective, since the overload definition as a negative affective effect caused by the surplus of information beyond the consumer's individual's processing capacity [5] isn't valid for virtual consumers, the word "negative" must not be avoided, since that the confusion reduction with the increase on the amount of information is a positive effect.

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