Zagreb International Review of Economics & Business (ZIREB),
Special Issue, December 2008, ISSN: 1331-5609

MEASURING USER SATISFACTION WITH RESPECT TO WEBSITES

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Abstract

The aim of this research is two-fold. Firstly, to examine the dimensionality of the satisfaction construct reviewing the related literature on user satisfaction with respect to websites and identifying different website attributes which contribute to the satisfaction's formation. Secondly, to develop and validate a reliable instrument for measuring users' satisfaction as well as highlight the disadvantages of conventional econometric methods when they are used in order to find out the relationships between satisfaction and its antecedents. Each item of the proposed instrument was supported by components of other instruments explaining how and why all these items were consolidated in this new enlarged instrument. The elements of this new instrument were divided into specific and general attributes of a website. Thus, the attributes' selection was based on three main categories that were information quality, system quality and security-privacy. A survey on satisfaction with websites was conducted having a sample of 370 respondents and receiving evaluations for 18 specific and 9 general attributes. Psychometric properties of the measures were examined indicating that all the attributes under examination are related to user satisfaction.

Keywords: User Satisfaction, Website Attributes, Information Quality, System Quality, Security-Privacy

JEL Classification: M150

1. Introduction

The popularity of computer technology has brought great changes in the Internet field. The Web has evolved into an environment for a wide range of activities, including entertainment, communication, commerce, information search and many others. Furthermore, during the last decade the number of Internet users as well as the number of websites has tremendously increased and hence it is expected to rise even more in the next years. These circumstances have fuelled predictions and speculations about what makes a website effective and successful. User satisfaction has been acknowledged as the most useful measurement of system success and according to Delone and Mclean (1992) this happened because there is a lack of other measures that could be measured by reliable tools presenting high degree of face validity. Satisfied users may spend more time at a website, tend to revisit it and spread the news about their satisfaction. In general, User Satisfaction may lead to an increase in retention, word of mouth, trust, loyalty and profitability. Therefore, it is crucial to determine what makes a user satisfied with a website.

Some studies (Jaspersen, 1996; Bearden and Teel, 1983) claim that satisfaction about a website could be measured by using results derived from server logs' statistics (number of visitors, duration of visits, frequency of visits) or by evaluating users' complaint activity. However, despite the fact that information from complaint e-mails and server logs may be important, it cannot clearly determine satisfaction or explain its formation. On the other hand, many scholars use a multi-attribute approach in order to determine web satisfaction (e.g., Doll and Torkzadeh, 1988; Delone and Mclean, 1992; Mckinney, Yoon and Zahedi, 2002; Janda, Trocchia and Gwinner, 2002). According to this approach, various attributes are identified and then it is estimated whether their performance affects overall satisfaction. Website attributes may be features or aspects of a website and a wide variety of them has been employed to identify the drivers of user satisfaction with websites. Despite the fact that researchers with various labels and different measures have used these attributes, each construct reflects a specific concept.
For instance, Delone and Mclean (2002) proposed a model for information system success considering web quality as the most important determinant of user satisfaction. According to their model, web quality may be divided into information quality, system quality and service quality. Furthermore, Mckinney, Yoon and Zahedi (2002) identified some key dimensions of information and system quality while Kalakota and Whinston (1996) as well as Raganathan and Ganapathy (2002) highlighted the importance of security and privacy in the formation of users' satisfaction.

2. Theoretical Background

Although the use of Internet has been increased over the last years, it still remains a relatively unexplored field. Yet, considerable research has been carried out investigating the factors that may lead to User Satisfaction with respect to websites. It is obvious that the most important factor that influences satisfaction is quality. However, it is extremely difficult to define quality because it is strongly dependent on each observer's point of view about what quality means and how it may be translated into specific requirements that determine a website's quality level. Despite these difficulties many researchers

have used in their models a wide variety of quality attributes that conform to the majority of viewpoints about how quality is expressed.
Delone and Mclean (2002) suggested that web quality might be divided into information quality, system quality and service quality. Information quality refers to the quality of information that is provided online by websites while system quality includes all those features that diminish users' difficulties during their interaction with a website as well as enhance their entertainment. Service quality is concerned with the quality of a service or product which is provided by a website. Mckinney, Yoon and Zahedi (2002) identified understandability, reliability and usefulness of information as the key dimensions of information quality while system quality was found to be associated with access, usability and navigation. Hoffman, Novak and Yung (2000) underlined the importance of interactivity that also determines system quality. Parasuraman, Zeithaml and Berry (1988) identified five dimensions of service quality including tangibles, reliability, responsiveness, assurance and empathy while Gefen (2002) adapted these dimensions into the web environment. On the other hand, user satisfaction could be affected by security and privacy issues although some studies (e.g. Cheung and Lee, 2005) claim that security could be a component of system quality.

Understandability is the degree to which the user can easily understand the information. It measures how well a website presents its information in order to be clear, meaningful, interpretable and comprehensible. Thus, it depends on the format of the information as well as its representational conciseness and consistency. Dedeke (2000) stated that concise and consistent representation of the information published on websites enhances understandability while Palmer and Griffith (1998) found that there are types of format that could make information more attractive, useful and understandable. Respectively, reliable information means that the information is valid and sound. Reliability can be ensured only when some requirements are met. For instance, if the information is accurate, up-to-dated, and objective as well as it originates from official sources then it can be considered reliable. Madu and Madu (2002) as well as Xiao and Dasgupta (2002) found that timeliness and accuracy of information play an important role in satisfaction's formation. Finally, useful information means that the information can be used effectively for a given purpose. In other words, usefulness gives to website users the ability to use the information for their purposes. Therefore, according to many researchers (e.g. Anderson and Sullivan, 1993; Lee *et al.*, 2002; Waite and Harisson, 2002) it is essential that the information is complete, relevant and it includes all the necessary details, so that visitors can make use of it.

The constructs of system quality focus mainly on the components of a website which influence its ease of use, flexibility and efficiency. In particular, access includes the procedure followed by a user to access the pages of a website. The time and effort spent by users during this procedure determines the quality of access for a website. Cheung and Lee (2005) found that User Satisfaction is strongly dependent on the quality of access that is determined by speed of access (Aladwani and Palvia, 2002) and websites' availability (Nielsen, 1999). Usability represents how easily a user can use the features of a website. Furthermore, it shows the attitude of a website toward its users. In other words, a user-friendly environment enhances usability and eventually satisfaction (Khalifa and Liu, 2002). For example, a well-organised site that is easy to use and provides simple and clear instructions avoiding confusion can be considered user-friendly. Rai, Lang and Welker (2002) urged that system quality is mostly represented by ease of use. Thus, moving around within a website should be easy and intuitive for

users. This is accomplished when a website meets all the requirements of navigation. The navigation structure is really important for a website. Gehre and Turban (2000) found that clear and short navigation paths with quick page-loading enhance navigability. Hence, detailed and clear links that facilitate users moving to other pages of the same site or of other sites contributes to browsing and finally have a positive effect on user satisfaction (Radosevich, 1997). Interactivity is concerned with how the websites interact with their visitors. It is defined as the facility for users and websites to communicate directly one another. In this sense, interactivity includes any action a user or a website takes while a user is visiting a website. Lowry *et al.* (2006) showed that the more interactive a website was, the more likely a user was to experience satisfaction. Two-way communication and active control of users are considered critical dimensions of interactivity and they all play a key role in determining user satisfaction (Hoffman, Novak and Yung, 2000).

Security and privacy are two inter-connected constructs and their performances usually depend on each other. According to Kalakota and Whinston (1996) a security threat is defined as a condition or event which is able to corrupt or modify the amount of data which is exchanged between websites and users. Raganathan and Ganapathy (2002) found that two dimensions of an effective website were security and privacy while Furnell and Karweni (1999) showed that users rarely trust websites and avoid giving personal information for fear of losing confidentiality. Privacy and security are important to build trust and long-term relationship between users and websites.

Measuring User Satisfaction by using instruments (Doll and Torkzadeh, 1988; Wang, Tang and Tang, 2001) that contain information about its antecedents' performance is very important. Nevertheless, it is not clear how their performance affects satisfaction. There are many models that attempt to explain these relationships. Conventional econometric methods such as regression models and structural equations models have often been used in order to estimate the parameters of such kind of models. However, these methods require a wide range of restrictive assumptions and estimations that have a great influence on the analysis's outcome. For example, regression models assume that the underlying sample is normally distributed while structural equation models consider that the linear coefficient of the relation with the dependent variable remains the same for all the values that the antecedent may take. Moreover, their ability to perform models of high complexity is limited and they present lack of flexibility (Uysal and Roubi, 1999). Thus, their performance is diminished in case of multicollinearity and they present high sensitivity to missing or inaccurate data resulting in wrong outcomes (Wray, Palmer and Bejou, 1994). Last and most important, prior knowledge of the functional form of the relationships between dependent and independent variables are presumed. Therefore, the analysis's results are strictly bound to the assumptions that have been made by the researcher while the high probability of nonlinear relationships increases the doubt about the results' validity.

3. Methodology

This study borrows elements from prior literature modifying them in order to fit its specific context. Therefore, some examples of previous studies are presented in order to examine the data collection procedures employed, the measurement used, the

instruments' reliability and validity tests as well as some methods followed to enhance reliability and validity.

3.1 Validity and reliability of other instruments

Xiao and Dasgupta (2002) tested the validity and reliability of an instrument developed by Doll and Torkzadeh (1988) for measuring user satisfaction with web portals. That research asked a sample of 340 end users who were graduate students at a large mid-Atlantic university about their satisfaction with web portals. The questionnaires included twelve questions about five components of satisfaction and two questions about satisfaction. These components were content, accuracy, format, ease of use and timeliness. The respondents were asked to evaluate each item on a 5-point Likert scale as well as to provide information about their gender, work experience and the location (home, work, school) that they usually access the internet. The construct validity of the instrument was evaluated through factor analysis and item-total correlation. During the factor analysis of the twelve-item instrument all items were found to have satisfactory factor loadings with respect to the threshold value of 0.7. Then the correlation of score of each item with the total score of the remaining items was examined (item-total correlation). Only one item was found to have a correlation coefficient less than 0.5 that was used as a threshold value. The final step of the research was to examine the correlations between the score of each item with the score of the questions about the users' satisfaction with web portals. The cut-off threshold was taken as 0.4 according to Doll and Torkzadeh (1988). All items exceed that limit except for the same item that had failed to pass the item-total correlation test.

Wang, Tang and Tang (2001) developed an instrument for measuring customer satisfaction toward websites that market digital products and services. The instrument's items regarded information about customer support, security, ease of use, products/services, transaction and payment procedures, information content and innovation. The initial instrument of that study involved 40 items including two global measures of perceived overall satisfaction and it was applied to a sample of 520 adult respondents. A five-point Likert scale from "strongly disagree" to "strongly agree" was used in order to evaluate the items' performance. The above instrument presented a reliability of 0.92. Moreover, items with item-to-total correlations below 0.4 were eliminated. Then factor analysis was conducted using principal components as the extraction technique and varimax as the rotation method. To improve unidimensionality and discriminant validity a minimum eigenvalue of 1 was used as a cut-off value for extraction while items with factor loadings less than 0.5 on all factors or greater than 0.5 on two or more factors were deleted. The iterative sequence of factor analysis and item deletion was repeated, resulting in a 21-item instrument which that represented seven factors. The reliability of each factor exceeded the minimum standard of 0.7 while the criterion-related validity was assessed by the correlation between the total scores on the instrument (sum for 21 items) and the measures of valid criterion (sum for two global items). The instrument had a criterion-related validity of 0.876 at a significant level.

3.2 Measures

3.2.1 Main categories

All the constructs for this study are related to three main categories. These categories are information quality, system quality and security-privacy (table 1).

Table 1: Main categories

Name	Brief description	Supporting References
Information quality	The quality of information on websites	Delone and Mclean (2002) Mckinney *et al.* (2002)
System quality	The quality of systems that enable interaction with websites	Delone and Mclean (2002) Mckinney *et al.* (2002)
Security-Privacy	The protection of users' and websites' data	Raganathan and Ganapathy (2002) Kalakota and Whinston (1996)

3.2.2 Website attributes

After defining the main categories, nine general website attributes that determine them are presented (table 2). The construct selection is based on a study of Mckinney, Yoon and Zahedi (2002). In particular, understandability, reliability and usefulness are chosen as determinants of information quality while access, user-friendliness, navigation and interactivity as determinants of system quality. The constructs of the security-privacy category are security and privacy. Subsequently, 18 specific attributes (two for each general attribute) are selected (table 3). Specifically, comprehensibility and presentation of information are considered components that may enhance understandability while accuracy and timeliness should mainly influence reliability. Thus, the fact that the information is relevant and in detail is expected to affect its usefulness. On the other hand, websites' availability and speed of access are selected as components of access, ease of use and general organisation as attributes of user-friendliness while page-loading and hyperlinks correspond to navigation. Two-way communication and active control may have a significant impact on interactivity. Finally, the level of confidentiality, integrity, protection and authorisation may be able to influence privacy and security.

Table 2: General attributes

Name	Brief description	Supporting References
Understandability	The clearness and goodness of information on websites	Mckinney *et al.* (2002) Gefen (2002) Cheung, Lee (2005)
Reliability	The validity and soundness of information on websites	Mckinney *et al.* (2002) Kim *et al.* (2003) Cheung, Lee (2005)
Usefulness	The effective use of information for a given purpose	Lu, Yeung (1998) Gehre, Turban (2000) Mckinney *et al.* (2002)

Access	Easy and fast access to information on websites	Mckinney *et al.* (2002) Cheung, Lee (2005)
Friendliness	It represents a user-friendly web environment	Mckinney *et al.* (2002) Khalifa, Liu (2002)
Navigation	Facilities that enable users to make their way through websites' pages	Rice (1997) Mckinney *et al.* (2002)
Interactivity	It represents how direct is the communication	Palmer (2002) Teo *et al.* (2003)
Security	The protection of data from intruders	Kalakota, Whinston (1996) Janda *et al.* (2002)
Privacy	The protection of users' personal information when they visit websites	Huang *et al.* (1999)

Table 3: Specific attributes

Name	**Brief description**	**Supporting References**
Easy to comprehend	The information is presented in such a way that is understandable	Aladwani, Palvia (2002)
Well-presented	The representation of information published on websites	Palmer, Griffith (1998) Dedeke (2000)
Accurate	The content of information is accurate and precise	Madu, Madu (2002) Xiao, Dasgupta (2002)
Up-to-dated	The information on websites is up-to-dated	Huang *et al.* (1999) Madu, Madu (2002)
Relevant	The information is complete and relevant to users' claims	Waite, Harisson (2002)
Detailed	The information is presented in detail	Anderson, Sullivan (1993)
Speed of access	The time that is required for a user to access a website	Lee *et al.* (2002) Aladwani, Palvia (2002)
Availability	Websites are up-and-running whenever users want to access them	Nielsen (1999)
Ease of use	It represents how easy is for users to use websites' features	Huang *et al.* (1999) Rai *et al.* (2002)
Well-organised	A controlled and structured web environment	Nielsen (1999)
Page-loading	The time that is required to load a web page	Gehre, Turban (2000) Weinberg (2000)
Hyperlinks	Links that enable users to move around within and out websites	Radosevich (1997)
Two-way communication	Bi-directional flow of communication between users and websites	Hoffman *et al.* (2000) Lowry *et al.* (2006)
Active control	Users are able to determine and guide the interaction between them and websites	Hoffman *et al.* (2000) Lowry *et al.* (2006)
Confidentiality	Users' personal information remain secret	Furnell, Kaweni (1999)
Integrity	The data on websites are not corrupted or modified	Kalakota, Whinston (1996) Albuquerque, Belchior (2002)

Protection	The data on websites are protected against viruses or malicious code	Kalakota, Whinston (1996)
Authorisation	Websites permit only authorised access to specific information	Kalakota, Whinston (1996)

3.2.3 Scaling

A seven-point Likert scale anchored by "strongly disagree" to "strongly agree" was used in order to measure the performance of all website attributes. On the other hand, the question about overall satisfaction was rated by respondents on a nine-point Likert scale from "very dissatisfied" to "very satisfied". The actual number of choices was increased for the overall satisfaction question in order to decrease bias and improve reliability (Nunally, 1978). Each scale includes a neutral point enabling the respondents to remain neutral. Excluding the neutral point would force the respondents to choose between "disagree"/"dissatisfied" or "agree"/"satisfied" and this could reduce the reliability of the scale as the results would not be necessarily true.

3.3 Data collection

This research conducted a survey of 370 internet users about their satisfaction with websites. A questionnaire that included 32 questions was given personally to each respondent who were all citizens of Greece. Participants were voluntary and they were assured that their individual responses would be treated as confidential. They were asked to complete the questionnaires based on their personal experience with the websites they had visited. There were 18 questions about the specific attributes' performance, nine questions about the general attributes' performance and a global question about their overall satisfaction with websites. Moreover, there were four demographic questions about the gender, the age, the level of education and the experience of the respondent with the internet (table 4).

Table 4: Demographics of survey respondents (N=370)

Item	Frequency	Valid Percent	Cumulative Percent
Gender			
Female	184	49.7	49.7
Male	186	50.3	100.0
Total	370	100.0	
Age			
Less than 20	72	19.5	19.5
20-30	221	59.7	79.2
More than 30	77	20.8	100.0
Total	370	100.0	
Education			
Less than Bachelor degree	141	38.1	38.1
Bachelor degree	165	44.6	82.7
More than Bachelor degree	64	17.3	100.0
Total	370	100.0	
Experience			
Less than one year	65	17.6	17.6

1-5 years	218	58.9	76.5
More than 5 years	87	23.5	100.0
Total	370	100.0	

3.4 Method of analysis

In order to estimate the reliability of this survey's instrument some reliability tests are performed. In particular, the Cronbach alpha value for all the general attributes as well as its value for all the specific attributes is calculated. The cut-off threshold value for Cronbach alpha is taken as 0.70 according to Nunally (1978). If alpha is greater than or equal to 0.70 then the items are considered unidimensional and may be combined in a scale. Thus, the correlation of each item's score with the total score of the remaining items of the same kind of attributes is examined (item-total correlation). A low item-total correlation means the item is little correlated with the overall scale and by dropping it reliability may be enhanced. A correlation coefficient less than 0.50 (Xiao and Dasgupta, 2002) is used as a threshold value. Finally, the correlation of each item with the item that measures the overall satisfaction should have at least a value of 0.40 (Doll and Torkzadeh, 1988).

In order to assess convergent and discriminant validity, a specific procedure is followed. Initially, factor analysis is conducted for the specific attributes. In the case that the general attributes may be considered factors of the specific ones, then it is expected that each pair of them load unambiguously on their own factor. Moreover, the average variance extracted (AVE) should be more than 0.50 (Fornell and Larcker, 1981). Thus, factor analysis is performed once for the specific attributes and once for the general attributes having as criterion the Kaiser Rule (drop all components with eigenvalues under 1.0).

Furthermore, internal consistency validity is assessed by the values of Cronbach alpha ($a \geq 0.70$) while criterion-related validity is assessed by the correlation between the sum of the specific attributes' scores and the score of the satisfaction variable as well as the correlation between the sum of the general attributes' scores and the score of the satisfaction variable.

4. Empirical Results

The reliability test indicated a high reliability for both specific (18-item, a= 0.922) and general (9-item, a=0.876) attributes while tables 6 and 7 show that there are no low item-total correlations since their values exceed the cut-off threshold of 0.50.

Table 6: Item-total correlation for the specific attributes

	Item-Total Correlation		Item-Total Correlation
Easy to comprehend	.554	Ease of use	.646
Well-presented	.549	Well-organised	.660
Accurate	.628	Page-loading	.569

Up-to-dated	.608	Hyperlinks	.582
Relevant	.571	Two-way communication	.699
Detailed	.587	Active control	.632
Speed of access	.609	Confidentiality	.658
Availability	.553	Authorisation	.585
Ease of use	.646	Integrity	.611
Well-organised	.660	Protection	.548

Table 7: Item-total correlation for the general attributes

	Item-Total Correlation
Understandability	.572
Reliability	.604
Usefulness	.606
Access	.642
Friendliness	.620
Navigation	.598
Interactivity	.696
Security	.566
Privacy	.650

Thus, the instrument's reliability is enhanced since all attributes' correlation with User Satisfaction was found to be greater than 0.40. All values ranged from 0.531 to 0.795 and were significant at the 0.01 level (2-tailed). Subsequently, the instrument's criterion-related validity lies at very high level. In particular, the specific attributes presented a criterion-related validity of 0.926 while for the general attributes the instrument's criterion-related validity was 0.929.

Furthermore, factor analysis was conducted for the specific attributes using Principal Component Analysis and Varimax rotation resulting in nine factors for User Satisfaction explaining 87.6 per cent of its variance. As it is, each pair of specific attributes has high loading on a specific factor (table 8).

Table 8: Rotated component matrix for the specific attributes

	Component								
	1	2	3	4	5	6	7	8	9
Easy to comprehend	.071	.099	.810	.317	.048	.230	.055	.043	.183
Well-presented	.143	.083	.859	.253	.047	.189	.082	.101	.080
Accurate	.137	.112	.256	.290	.095	.809	.131	.112	.083
Up-to-dated	.165	.044	.196	.209	.209	.843	.098	.091	.114
Relevant	.085	.114	.301	.820	.044	.256	.082	.077	.114
Detailed	.130	.075	.288	.830	.069	.221	.079	.102	.141
Speed of access	.127	.170	.024	.112	.799	.194	.236	.188	.123
Availability	.082	.233	.068	.001	.807	.105	.267	.186	.065
Ease of use	.046	.242	.107	.088	.319	.099	.799	.198	.179
Well-organised	.155	.243	.054	.092	.270	.153	.805	.238	.102
Page-loading	.065	.859	.069	.046	.162	.155	.144	.228	.147
Hyperlinks	.116	.805	.121	.154	.248	.019	.297	.133	.059
Two-way communication	.171	.288	.130	.079	.218	.166	.212	.761	.204
Active control	.221	.158	.051	.118	.215	.065	.223	.827	.158

Confidentiality	.275	.159	.182	.128	.198	.112	.156	.135	.786
Authorisation	.360	.080	.108	.150	.017	.093	.112	.207	.793
Integrity	.827	.160	.146	.120	.109	.108	.093	.186	.233
Protection	.833	.017	.072	.083	.097	.177	.078	.143	.302

Rotation converged in 7 iterations

On the other hand, tables 9 and 10 present the factors that are extracted by conducting factor analysis once for the specific attributes (explaining 65.2 per cent of User Satisfaction's variance) and once for the general attributes (explaining 75.2 per cent of User Satisfaction's variance) having as a criterion the Kaiser rule. The extraction technique is Principal Component Analysis while Varimax is used as a method of rotation. In both cases, three components are extracted after five iterations that are labelled information quality, system quality and security-privacy.

Table 9: Rotated component matrix for the general attributes (eigenvalues≥1.0)

	Component		
	System Quality	Information Quality	Security-Privacy
Understandability	.133	.854	.192
Reliability	.266	.692	.253
Usefulness	.216	.853	.137
Access	.807	.150	.247
Friendliness	.828	.158	.174
Navigation	.770	.282	.065
Interactivity	.653	.201	.480
Privacy	.293	.255	.795
Security	.156	.206	.882

Table 10: Rotated component matrix for the specific attributes (eigenvalues≥1.0)

	Component		
	System Quality	Information Quality	Security-Privacy
Easy to comprehend	.099	.809	.165
Well-presented	.117	.773	.172
Accurate	.263	.738	.169
Up-to-dated	.271	.667	.203
Relevant	.141	.817	.134
Detailed	.138	.796	.192
Speed of access	.729	.175	.169
Availability	.778	.088	.096
Ease of use	.801	.174	.147
Well-organised	.794	.168	.192
Page-loading	.702	.168	.140
Hyperlinks	.749	.178	.091
Two-way communication	.655	.192	.425
Active control	.606	.109	.456
Confidentiality	.316	.267	.701
Authorisation	.174	.222	.800
Integrity	.225	.218	.784

Protection	.130	.185	.830

Factor analysis has meaning since the Kaiser-Meyer-Olkin measure of sampling adequacy test (KMO) and the Bartlett's test of sphericity prove that the instrument's items are suitable for structure detection. In particular, KMO has a value of 0.888 when conducting factor analysis between the specific attributes and a value of 0.856 between the general attributes. Thus, the level of significance for the Bartlett's test is less than 0.05. Finally, the average variance extracted (AVE) for each extracted component is greater than 0.50 ranging from 0.73 to 0.84.

5. Conclusions

This study recognised some website attributes which contribute to User Satisfaction. User Satisfaction pertains to how satisfied a user is with respect to websites. Based on the theoretical background outlined, an instrument for measuring it was proposed and tested. The proposed instrument presented a high level of reliability and validity indicating that the selected attributes' performance may determine whether a user is satisfied or not. The instrument's elements were divided into specific and general attributes of a website. Thus, the results showed that each attribute represented a specific concept within a network structure. In particular, the general attributes may constitute factors of the specific attributes while all attributes have an effect on information quality, system quality, security-privacy and eventually on User Satisfaction. Finally, this study investigated and emphasised some disadvantages of conventional econometric methods. Nevertheless, there are several limitations. The survey's participants were asked to evaluate generally the performance of website attributes according to their experience for all the websites they had visited. Therefore, this study does not take into account the websites' type that may determine the importance of some attributes. The second limitation arises from the components of user satisfaction. All the selected attributes were related to information quality, system quality, security and privacy without including another important construct of satisfaction, which is service quality.

In summary, this study developed an instrument for measuring User Satisfaction raising interesting implications about the network structure of satisfaction's formation that may be used properly in order to recognise the relationship with its antecedents. However, the satisfaction's formation is a complicated procedure due to the fact that the importance of some attributes may be subject to their performance, therefore these relationships may not be simple.

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