

# *Investigating the Effect of Website Quality on Trader's Responses in E-Financial Services of Stock Brokerage*

## *Mediation of Perceived Value and Corporate Reputation*

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**Abstract**—The convergence of the stock market and the Internet has created new marketing channels in the e-commerce and stock market brokerage industry. Given the fact that the brokerage industry is customer-oriented, the principal challenge for firms active in this industry is attracting and maintaining customers and traders. This study aimed to assess the impact of the quality of financial service provider websites on customer responses among brokerages. The conceptual framework was developed based on the S-O-R paradigm so that, corporate reputation and perceived value used as the mediator factors. This research adopted a questionnaire survey. All factors were measured with multiple items. The conceptual model was tested using PLS-SEM and Smart PLS software. Findings show that website quality is a determinant factor in predicting customer responses. The impact of website quality directly on customer perceived value and corporate reputation was significant. Also, corporate reputation and perceived value have a positive and significant impact on purchase intention and word-of-mouth. The Sobel test results, at 95% confidence level, accepted the indirect impact of website quality on word-of-mouth and the purchase intention, taking into account the mediating role of corporate reputation and perceived value. In general, this research developed a proposed framework on the role of website quality on customer and trader behaviour in the brokerage industry.

**Keywords**—*E-finance; Website Quality; Trader's Response; Perceived Value; Corporate Reputation; WOM; Purchase Intention; SOR Paradigm*

### 1. INTRODUCTION

Progress in technology and advanced applications of electronic networks has had a significant impact on the development of electronic financial services. The financial services industry has acted as one of the leading sectors in the adoption and optimization of Internet technology in customer-oriented markets, and despite the move, slow some industries, banks, and brokers are among the pioneers of this sector [1]. The convergence of the stock market and the Internet, along with the creation of new marketing channels, has created new challenges in traditional e-commerce formats [2]. The brokerage industry has been significantly affected by e-commerce developments and has

become an appropriate way to provide financial services based on cheap web-based platforms.

In the initial stage of internet markets, internet-based financial businesses competed with traditional financial institutions by providing services at lower prices. But today, companies operating in internet markets need something else in order to attract customers. Therefore, financial institutions focus on the quality of electronic services [3]. The cost of acquiring a competitive advantage through service quality is lower than other methods. Hence, the quality of e-services is a key factor in acquiring a competitive advantage [4].

The fundamental issue among the brokers of the Iranian stock exchange is the use of the same trading platforms, which give the same perceived value to customers. The quality of services in the online environment has a significant impact on various aspects of e-commerce. according to [5] Website quality is one of the determinants of service quality. Most research on the impact of website quality has emphasized the use of the SERVQUAL model and its impact on variables such as customer satisfaction, trust, and loyalty [6-8]. But so far, the impact of website quality on brokerage services has not been tested on customer responses.

Considering that brokers are profitable organizations that are heavily dependent on attracting customers to continue to operate in financial markets, it is necessary to study the potential impacts of the quality of online services provided, such as online trading systems, online ordering, and more. The goal of this study is to evaluate the impact of website quality on customer responses by the mediation of perceived value and corporate reputation in the brokers.

### 2. RESEARCH FRAMEWORK AND HYPOTHESES

With the advent of the Internet in the last two decades, there have been many types of research on the effects of the quality of web-based services [6, 7, 9-13], but the impact of the quality of online services on the behaviour of traders in the brokerage industry has been less widely considered. According to the research background, the aim of most of these researches on the effects of website quality has been on responses such as

satisfaction and loyalty. But the framework that determines how the website quality indirectly affects the behaviour of traders through the perceived value and corporate reputation has not yet been tested.

The theoretical framework of this research is according to the stimulation-organism-response (S-O-R) paradigm. The S-O-R paradigm has been considered by researchers in various research [9, 10, 14-19]. In the conceptual framework of the research, website quality has been used as a stimulus to predict customer's responses such as word-of-mouth (WOM) and purchase intention. The conceptual model is shown in Figure. 1.

### 2.1 Stimulus: Website Quality

In the academic literature, website quality has generally been recognized as a critical step to drive business online [10]. According to Jeong and Gregoire [20], website quality has been defined as, the effectiveness of delivering messages to audiences. The results of [21] indicate that website quality influence consumer's perceptions of quality, which subsequently affects online purchase intent.

Over the past two decades, several studies have been led to identify the dimensions of website quality. Often this researches has introduced the website quality as a multi-dimensional factor. In the researches [6, 7, 22-26], the indicators for measuring the website quality are presented in three dimensions: quality of information, service quality, and system quality. These three dimensions represent the system's features, content, and quality of the website [6].

Perceived information quality is defined as the degree to which the user believes that the information of the website has the attributes of content, accuracy, format, and timeliness [27]. The system quality also reflects features such as reliability, effective navigation, and web page layout. A website system has two aspects: information and services. Generally, the quality of the system is the basis of the overall quality of a website [6]. The services quality is also general support provided by the website to users and customers [22]. Perceived service quality is defined as the degree to which the user believes the website is responsive, interactive, clear about security and privacy policies, and effective in its search and comparison capabilities [22, 25, 26].

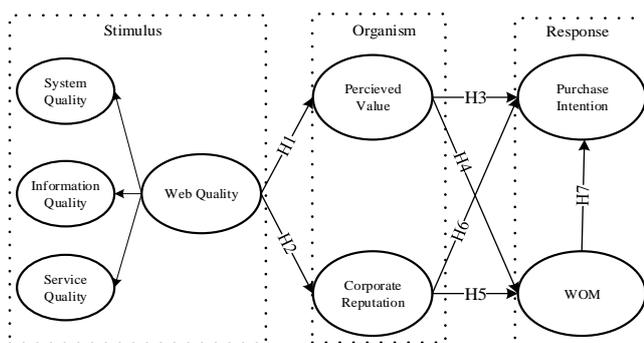


Fig. 1. Conceptual model

### 2.2 Organism: Perceived Value and Corporate Reputation

Perceived value from an economic point of view; The difference between the highest price the consumer is willing to pay for a product or service is the amount he has paid [28]. The result of research [29] shows that the customer's perceived value of a website service has a direct impact on customer purchasing behaviour. Also, the research background shows that perceived value has a mediating role among web quality and customer response [28, 30, 31]. Therefore, the perceived value plays a potential role as a mediator in the response of customers.

Another variable considered in the conceptual model is the "corporate reputation" variable. Corporate reputation is an important consideration [32]. The concept of corporate reputation in various fields such as economics, organization, and marketing has attracted the attention of researchers. The concept of corporate reputation in the field of marketing, called "Brand Equity", is examined [33]. The corporate reputation can bring many benefits. Among these benefits is the purchase intention. Other benefits of corporate reputation include improving company image, attracting and retaining customers, and establishing long-term relationships with customers [34-36]. Understanding the role of corporate image in the customer retention decision is a key issue that has received little attention in the service marketing area [37]. Therefore, in the present study, while considering the vacuum in the research background, the role of the corporate reputation as a mediator in explaining customer responses is tested.

### 2.3 Response: Purchase Intention and WOM

The goal of most marketing activities in e-commerce is to study the behaviour of customers and identify the factors that affect the intent of customer purchases. Failure to buy from websites is one of the main obstacles in the development of e-commerce [38]. In various studies [9, 10, 15], the purchase intention has been used as a behavioural response in the S-O-R paradigm. The results of these examinations show that the responses of customers in the online environment are related to their perceived quality of website services. Hence, the role of quality of service and the quality of information presented on a website is a factor in increasing customer intention, which shows the importance of website quality in the intent to purchase the service.

Word-of-mouth (WOM) is another potential response from customers to the quality of online services, an informal way of communicating between groups of people about the evaluation of products and services [39]. WOM is very important for intangible service providers who are heavily dependent on the advice and experience of customers [40]. Based on the theoretical framework of the research, the hypotheses are as follows:

H1: Website quality has a positive effect on customer perceived value.

H2: Website quality has a positive effect on corporate reputation.

H3: Perceived value has a positive effect purchase intention.

H4: Perceived value has a positive effect on WOM.

H5: Corporate reputation has a positive effect on WOM.

H6: Corporate reputation has a positive effect purchase intention.

3. RESEARCH METHOD AND DATA ANALYSIS

This research adopted a questionnaire survey. All factors were measured with multiple items. These items were adapted from extant literature to improve content validity. After the questionnaire was completed, it was first tested among 35 users with rich brokerage website user experience. Then we revised some items based on their suggestions to make items easier to understand. The validity of the questionnaire was assessed through two methods of content validity and construct validity. In the data analysis section, we use the least-squares method (PLS) using Smart PLS software to estimate path coefficients and T-values. Estimated factor loadings, reliability, and validity indexes are present in Table 1.

According to Table 1, all factor loads are more than 0.4. Also, the Cronbach's alpha and compound reliability are more than 0.7. The average variance extracted is a good test of convergent validity [49]. AVE is a criterion to measure

TABLE 1. VALIDITY AND RELIABILITY ITEMS AND INDICATORS

R <sup>2</sup>	AVE <sup>b</sup>	CR <sup>a</sup>	Cronbach's alpha	Factor loading	Item	Factor	Source
0.858	0.665	0.908	0.873	0.736	SYQ1	SYQ	[14, 6]
				0.834	SYQ2		
				0.785	SYQ3		
				0.856	SYQ4		
				0.852	SYQ5		
0.162	0.576	0.872	0.818	0.777	IQ1	INF Q	[43]
				0.765	IQ2		
				0.793	IQ3		
				0.750	IQ4		
				0.793	IQ5		
0.728	0.550	0.859	0.795	0.731	SVQ1	SVQ	[30, 42, 43]
				0.776	SVQ2		
				0.719	SVQ3		
				0.737	SVQ4		
				0.742	SVQ5		
0.65	0.690	0.872	0.78	0.764	PV1	PV	[37, 44, 45]
				0.882	PV2		
				0.852	PV3		
0.636	0.688	0.898	0.848	0.852	CR1	CR	[47, 48]
				0.794	CR2		
				0.814	CR3		
				0.855	CR4		
0.266	0.672	0.833	0.713	0.0845	PI1	PI	[47, 48]
				0.854	PI2		
				0.662	PI3		
0.205	0.700	0.875	0.787	0.788	WM1	WOM	[47, 48]
				0.865	WM2		
				0.855	WM3		

<sup>a</sup>. Composite reliability

<sup>b</sup>. Average Variance Extracted

convergent validity and should be more than 0.50 [50]. AVE values are also more than 0.50 for all factors. The AVE estimate is the average amount of variation that a latent construct is able to explain in the observed variables to which it is theoretically related. For the discriminant validity, PLS is a good way to ensure the extent to which a given construct of the model is different from other constructs [51]. The square of the correlations among the variables has been compared with the AVE to assess the discriminant validity [52]. Table 2 shows the square of the correlation between latent variables, ensuring the research's discriminant validity. The discriminant validity was assessed using Fornel and Larcker by comparing the square root of each AVE in the diagonal with the correlation coefficients for each construct in the relevant rows and columns [53]. Overall, discriminant validity can be accepted for this measurement model and supports the discriminant validity between the constructs.

The cross-loading is presented in Table 3, which shows that the factor loading of all indicators is greater than the construct of them on any other factors.

TABLE 2. FORNELL AND LARCKER MATRIX

	CR	IQ	PV	PI	SVQ	SYQ	WOM
CR	0.829						
IQ	0.192	0.776					
PV	0.710	0.220	0.834				
PI	0.449	0.088	0.460	0.792			
SVQ	0.699	0.134	0.640	0.545	0.741		
SYQ	0.768	0.248	0.818	0.474	0.657	0.816	
WOM	0.403	0.011	0.431	0.358	0.586	0.443	0.837

TABLE 3. CROSS LOADINGS

	CR	IQ	PI	PV	SVQ	SYQ	WOM
CR1	0.852	0.162	0.371	0.661	0.564	0.755	0.363
CR2	0.794	0.114	0.370	0.469	0.662	0.530	0.373
CR3	0.814	0.175	0.342	0.597	0.531	0.600	0.307
CR4	0.855	0.189	0.405	0.623	0.562	0.651	0.293
IQ1	0.208	0.777	0.131	0.204	0.152	0.252	0.061
IQ2	0.122	0.765	0.063	0.134	0.121	0.159	0.020
IQ3	0.129	0.793	0.099	0.226	0.093	0.208	-0.007
IQ4	0.147	0.750	0.044	0.149	0.076	0.194	-0.033
IQ5	0.124	0.793	-0.029	0.123	0.062	0.124	-0.013
PI1	0.393	0.079	0.845	0.374	0.492	0.398	0.319
PI2	0.431	0.071	0.854	0.437	0.480	0.454	0.314
PI3	0.172	0.057	0.662	0.239	0.275	0.216	0.190
PV1	0.510	0.132	0.398	0.764	0.431	0.609	0.277
PV2	0.654	0.170	0.438	0.882	0.594	0.737	0.407
PV3	0.603	0.246	0.315	0.852	0.563	0.695	0.383
SVQ1	0.524	0.096	0.469	0.518	0.731	0.492	0.424
SVQ2	0.528	0.069	0.462	0.505	0.776	0.536	0.500
SVQ3	0.460	0.090	0.338	0.441	0.719	0.438	0.393
SVQ4	0.496	0.163	0.363	0.500	0.737	0.511	0.433
SVQ5	0.584	0.078	0.384	0.402	0.742	0.451	0.416
SYQ1	0.553	0.144	0.405	0.625	0.471	0.736	0.331
SYQ2	0.659	0.198	0.436	0.686	0.596	0.843	0.416
SYQ3	0.595	0.288	0.297	0.688	0.517	0.785	0.342
SYQ4	0.690	0.193	0.367	0.666	0.574	0.856	0.370
SYQ5	0.626	0.186	0.431	0.672	0.514	0.852	0.344
WOM1	0.301	-0.041	0.347	0.319	0.498	0.319	0.788
WOM2	0.393	0.025	0.351	0.408	0.523	0.434	0.865
WOM3	0.307	0.037	0.195	0.344	0.447	0.346	0.855

Therefore, the convergent validity of the research has been achieved to a satisfactory level. This has been achieved by looking at factor loadings of an indicator, which should be greater than the construct of it than on any other factor [52].

3.1. The goodness of Fit (GOF)

The goodness of fit (GOF) has been developed as an overall measure of model fit for PLS-SEM. This criterion calculated by (1) [54]:

$$GOF = \sqrt{\text{communality} \times R^2} = \sqrt{0.61 \times 0.497} \approx 0.55 \quad (1)$$

Based on equation (1): the average communality, the average proportion of variance explained when regressing the reflective indicators on their latent variables [55], and the average R<sup>2</sup> of the endogenous latent variables. Values higher than 0.36 indicate optimal fit [56]. According to the calculations of (1), this value is 0.55, which indicates the optimal fit of the research model.

We used PLS-SEM software Smart PLS to estimate path coefficients and test model hypotheses. All path coefficients and factor standardized shown in Figure 2.

3.2. Sobel Test

In the final step of analyzing the data, the Sobel test was used to examine the mediating role of perceived value and corporate reputation in the conceptual model. Baron and Kenny have proposed the Z statistics for a meaningful test of an indirect path [57]. The Z statistics calculated by (2) and the results are shown in Table 5.

$$Z = a \times b / \sqrt{b^2 s_a^2 + a^2 s_b^2} \quad (2)$$

4. RESULTS

Based on the results of the structural analysis, the PLS method, in Table 4 and Figure 2, given the high value of the T statistic from 1.96 and also the low level of significance (P) from the permitted error level (0.05), at 95% confidence level, we have no reason to reject the hypotheses. The results show that the effect of perceived value and the corporate reputation on the purchase intention and WOM are positive and significant. Also, WOM has a positive and significant effect on purchase intention.

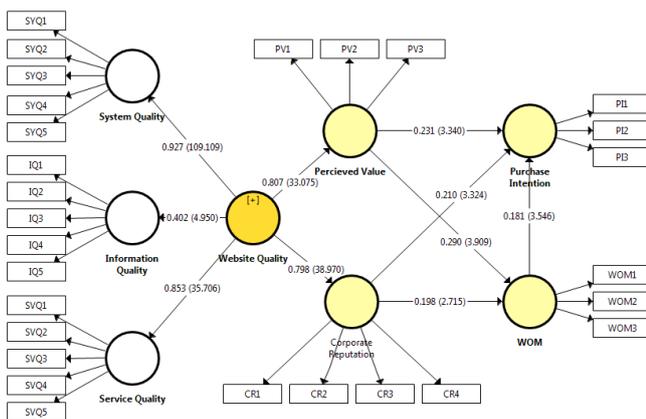


Fig. 2. Model Estimate Results

Based on Sobel test results, at the 95% confidence level, the mediating role of perceived value and corporate reputation was accepted

The results of the indirect paths showed in Table 5. The results of the indirect paths by the Sobel test indicate that the mediating role of perceived value and corporate reputation is approved. Also, results show that the mediating role of perceived value in influencing web quality on WOM has the highest path coefficient.

5. CONCLUSION AND RECOMMENDATIONS

The present study obtained significant results on the impact of website quality on e-financial services on the responses of stock traders. In the conceptual model, WOM and corporate reputation used as a mediator, which has been less considered by researchers in previous researches.

Hypotheses were developed using the theoretical framework of the research and an S-O-R paradigm. The results of the data analysis using the PLS method indicate acceptance of the research hypotheses at 95% confidence level. Also, the study of indirect paths using the Sobel test showed that perceived value and corporate reputation have a mediator role in the model. In other words, the perceived quality of online brokerage services, while increasing the perceived value and enhancing the reputation of the brokerage among traders, leads to positive WOM and, consequently, a potential purchase intention.

The main suggestion of the present research is to consider the desires of traders in the design of online trading platforms. Due to this fact that website quality is a multi-dimensional factor, overall quality improves by simultaneously improving system quality, information quality, and service quality.

Due to the role of mediator of CR, research findings show that the quality of the website has an impact on WOM and PI. Therefore, considering the benefits that a positive reputation can bring to a firm, it is suggested that, while improving the quality of website brokerage services, the "website brand" should also be considered as a new topic in the marketing. Another suggestion is to provide facilities such as conducting web-based online technical stock technical analysis that can be made available to traders at the same time in the capital market.

TABLE 4. TEST RESULTS HYPOTHESES

Hypothesis	Path	Path coefficient	T-value	P-value
H1	Web Q → PV	0.81	33.075	0.000
H2	Web Q → CR	0.80	38.970	0.000
H3	PV → PI	0.23	3.340	0.001
H4	PV → WOM	0.29	3.909	0.000
H5	CR → WOM	0.20	2.715	0.007
H6	CR → PI	0.21	3.324	0.001
H7	WOM → PI	0.18	3.546	0.000

TABLE 5. MEDIATING ROLES

Indirect Path	Path coefficient	Z-value	P-value
Web Q → PV → PI	0.19	3.33	0.001
Web Q → PV → WOM	0.23	3.90	0.000
Web Q → CR → WOM	0.16	2.73	0.006
Web Q → CR → PI	0.17	3.32	0.001

The reputation of the firm leads to a long-term relationship between the customer and the firm, and this issue is important because of the dependence of the stock brokerage industry on the attraction and maintenance of customers. Hence, by making positive promotions along with matching the slogan with online services, potential benefits can be gained. The results show that website quality is a determining factor in creating positive reaction behaviors. One of these reactions is WOM.

One of the limitations of this research is that the  $R^2$  and AVE values of the research model show a significant amount of non-described variance in this model, so considering other variables that can improve the described variance can be found in later research. This restriction has been fixed.

Brokers in the Iranian stock market usually deliver similar services. Therefore, by providing various services, the broker can provide a platform for increasing the perceived value and reputation of the firm, which leads to the development of positive WOM. According to the results, positive WOM is effective in purchase intention. Thus, using social networking facilities can be used to create electronic word-of-mouth (e-wom). In general, the study confirmed the role of mediator of perceived value and the corporate reputation for making WOM and purchase intent through website quality.

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#### APENDIX

##### System Quality

- Suitable design of the site and trading tools.
- Including features related to information search on the site.
- Instant processing of information on transactions (sending orders, etc.) on the site
- Ability to use trading tools at any time.
- Required username and password for Word to the site.

##### Information Quality

- Embedding the necessary information about trading symbols, charts and ... in trading tools.
- Traders are confident in the accuracy of the information provided in the trading tools.
- Online information provided on the site and compliance with the information published in the stock market.
- Appropriate categories and how to display information in trading platforms.
- Embedded technical analysis software on the site.

##### Service Quality

- Fast response to the needs of users.
- The facilities offered are in line with the needs of online traders.
- In the event of a problem with the provision of online services; tracking capabilities for customers.
- The services offered by the brokerage are in accordance with the slogan and their obligations.

##### Perceived Values

- Brokerage trading platforms are professionally designed.
- Depending on paid fees, making transactions with web-based tools seems reasonable.
- The necessary security and confidence for customers to deposit and request funds.
- Due to different ways of buying and selling stocks, using online tools is a good experience.

##### Corporate reputation

- A deal using the online site creates a decent image of the company for customers.
- A successful brokerage company has succeeded in implementing newly built tools.
- The brokerage has worked well against the professional needs of market capitalists.
- Professional services provided on the Web have been able to provide a decent image of the brokerage.

##### Purchase Intentions

- Online brokerage services are my priorities for conducting online trading (online).
- I am constantly using online brokerage services in my trades.

- I often want to do more in the capital market with online brokerage services.

Commitment

- I am glad that the client is a reputable broker.
- I hope that the services of this brokerage will continue in the future.
- The online services provided on the website are in line with my needs in this area.

Wom

- I tell my friends about using my brokerage online services.
- I recommend brokerage to people who are looking for online stock trading services
- I encourage close friends to deal with online brokerage tools.



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