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Unraveling the Link between Website Quality and Customer Trust, Satisfaction, and Loyalty: A Meta-analysis

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Abstract

With the aim of comprehensively investigating the most important consequences of website quality in e-commerce, this research has collected and analyzed data about the relationship between website quality and customer trust, satisfaction, and loyalty. In this regard, various studies were collected and coded. After that, the eligible studies to enter the meta-analysis based on the determined criteria were identified to be 49, 68, and 29 studies for the relationship between website quality and trust, satisfaction, and loyalty, respectively. The findings of data analysis using CMA2 software showed that website quality has the strongest relationship with satisfaction with an effect size of 0.591 and the weakest relationship with loyalty with an effect size of 0.516. The effect size of trust was also positive and equal to 0.555. In addition, the findings from the analysis of moderator variables also showed that an increase in the year of publication led to a decrease in the effect size of website quality-trust studies but an increase in the effect size of website quality-satisfaction and website quality-loyalty studies. Additionally, with an increase in the sample size, the effect sizes of website quality-trust studies increased, but the effect sizes of website quality-satisfaction and website quality-loyalty decreased.

Keywords: *Website Quality, Trust, Satisfaction, Loyalty, Meta-analysis*

Introduction

E-commerce has recently become the most advanced and popular business worldwide. As a result of the COVID-19 pandemic, the market for e-commerce stores on a global scale has become significantly more active than the conventional in-commerce industry (Nanda & Patnaik, 2023). E-commerce refers to a modern method of conducting business, which involves the buying, selling, or exchanging of products, services, and information. This is typically done through communication networks like the Internet, Intranet, and Extranet (Karami et al., 2020). This business model enables customers to engage in round-the-clock shopping from virtually any location, offering a wide array of choices, facilitating swift product

comparisons, and fostering interaction among consumers to exchange ideas and share experiences (Yoon & Occeña, 2015). In addition, it allows businesses to grow easily in the global market and opens up new ways for companies to communicate with consumers, suppliers and other stakeholders (Martini et al., 2023). Globally, there is an increasing trend in online shopping, which is considered an important priority due to the prevalence of the Internet (Qalati et al., 2021). The Internet is revolutionizing the business practices of companies, as consumers now have higher expectations for exceptional service, time efficiency, and enhanced convenience (Sembiring & Ginting, 2023). The Internet has emerged as a significant platform for shopping, offering consumers various advantages such as

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enhanced information accessibility, lower product prices, convenience, bypassing intermediaries, and a wider selection of products and services (Bartol et al., 2023). The utilization of Internet services allows organizations to attain a lasting competitive edge and offers distinctive prospects for businesses (Gholamian et al., 2021).

Since one of the main tasks of the Internet as a communication channel is to manage the quality of the website, which is important for customer satisfaction (S) (Sembiring & Ginting, 2023). In e-commerce, website quality (WQ) is very important; because users' opinions about website quality directly affect consumers' purchase decisions. Because of its vital role in improving consumers' purchase intention, website quality has been the focus of many researchers (Rahman & Hossain, 2023). Website quality, defined as the overall superiority or effectiveness of [the website] in delivering intended messages to audiences and viewers, plays an important role in shaping customer behavior. Website quality is very important for consumer engagement, which in turn is a key factor in increasing revenue. Websites are also used as a convenient channel for customer relationship management and for portraying a satisfactory and relevant image of the service provider, leading to higher sales volume (Ongsakul et al., 2021). Consumers should understand the quality of the e-commerce website well enough to consider it before purchasing. Similarly, website quality is an important factor in reducing consumers' risk-related concerns (Longstreet et al., 2022).

Website quality has important consequences, and many studies that have been conducted in the field of website quality have also investigated these consequences. Among these consequences are the trust (T), satisfaction, and loyalty (L) of customers. Over the years, though, the revenue from online shopping and the number of online shoppers have both grown steadily and significantly (Baidoun & Salem, 2023). But this type of business usually lacks human warmth (Oliveira et al., 2017). In an

environment where physical interaction is not possible, such as an e-commerce platform, users rely on features such as website quality, ease of use, and a well-designed, professional-looking website to be trusted (Mayayise, 2023). For consumers, ensuring online trust helps them mitigate vulnerabilities such as security and privacy breaches associated with online business transactions (Kim & Peterson, 2017). Leong et al. (2020) believe that lack of trust is the main factor that makes people reluctant to participate in online transactions (Leong et al., 2020). On the other hand, keeping customers satisfied is also vital for a company (Griva, 2022). A satisfied customer is expected to be loyal and make repeat purchases. Customer satisfaction is a complex human process that can include cognitive and emotional processes as well as other psychological and physiological influences, which is a critical issue in the success of any traditional or online business system (Sembiring & Ginting, 2023). The service quality of e-commerce websites has significant effects on users' satisfaction. Customers who have experienced a high level of service will visit that e-commerce website repeatedly, and the financial success of these companies will increase with high service quality (Sharma & Lijuan, 2015). Customer loyalty is another concept that has received increasing attention in today's businesses because loyal customers have become a key component of organizational success (Bakhshandeh et al., 2023). Loyal customers tend to overlook the company's flaws as well as its prices and recommend the brand to others (Khai & Xuan Van, 2018). In fact, the success or failure of a company in an online business can be seen from repeated purchases from loyal customers (Hansopaheluwakan, 2021). Customer loyalty can result in increased profitability for organizations (Eghbali et al., 2021) and serve as a dependable source of sustainable growth and guaranteed revenue (Falahatgar et al., 2021).

Although so far, various studies have investigated these three consequences of

website quality, a comprehensive picture of these three relationships has not been investigated so far. With the increase in the number of studies conducted in this field, we are faced with a dispersion of information, which makes it necessary to conduct combined research. Systematic reviews/meta-analyses offer a comprehensive and impartial overview of research on a particular subject by employing a meticulous and objective methodology. They also utilize statistical techniques to analyze data from multiple studies (Zhang et al., 2023). The meta-analysis method is employed to examine a specific hypothesis by analyzing the results of multiple independent studies (Katebi et al., 2024). Also, combining data from multiple previous studies increases the statistical power and generalizability of findings, leading to more accurate estimates (Sustacha et al., 2023). In general, meta-analysis can be considered a systematic review of quantitative research according to statistical and mathematical principles, which provides the possibility of obtaining accurate findings in the light of mathematical integration, increases the power of the test, and even discovers new relationships (Bakhshandeh et al., 2016).

By adopting a different approach, this research tries to comprehensively investigate the relationship between website quality and customers' trust, satisfaction, and loyalty. Therefore, this research seeks to answer the following questions:

- 1- What is the meta-analysis of the relationship between website quality and customer trust, loyalty and satisfaction?
- 2- What are the moderator variables in the relationship between website quality and customer trust, loyalty and satisfaction?

Literature Review

Website quality and trust

E-trust is an important factor that influences consumer behavior and can contribute to the success of technology adoption, such as e-commerce (Giao et al., 2020). Customer trust is one of the most important antecedents of online shopping

behavior. Because if customers do not trust a website, they will avoid doing their transactions with that website (Albayrak et al., 2020). Therefore, it is necessary to create trust in the minds of consumers towards the website in order to motivate and convince people or consumers to transact with the website (Wilson, 2020). Trust is a person's confidence or belief that the other person in the exchange will act in the way he expects and will not act opportunistically (Hsu et al., 2015). Trust is the customer's belief in relying on the seller to deliver the promised service (Priscillia et al., 2021). It is also defined as the confident belief of customers in the reliability and honesty of the seller (Liu et al., 2023). In the context of e-commerce, online trust is defined as a psychological state in which a person is placed in a vulnerable position due to the act of making an electronic transaction (Kousheshi et al., 2020). In an environment where physical interaction is not possible, such as an e-commerce platform, website quality is one of the attributes that users rely on for the e-commerce platform (Mayayise, 2023). If consumers see a high-quality website, they are more likely to trust the e-retailer (Park et al., 2012). Different studies (Yadav & Mahara (2017); Dogra et al. (2023); Albayrak et al. (2020)) have investigated the relationship between website quality and trust, so this hypothesis is also raised in this research:

H1: Website quality has a significant relationship with trust.

Website quality and satisfaction

The term customer satisfaction refers to a good emotional state that results from a favorable evaluation of the consumer's experiences with a company (Agag et al., 2024). Customer satisfaction is generally considered the result of a comparison between consumer expectations and experience. Customer satisfaction is achieved when the final deliverable (i.e., the experience) meets or exceeds the customer's expectations (Yoo et al., 2023). Customer satisfaction is considered the key factor

determining the success of an organization in today's competitive market. Knowing the level of customer satisfaction can help the organization evaluate the efficiency of its activities, determine future goals, and take necessary measures to maintain or increase it (Pileliene & Grigaliunaite, 2016). In the field of e-commerce, satisfaction can be defined as a holistic assessment of the relationship between a website user and an e-retailer. E-satisfaction actually goes beyond buyers' perceptions of products and services and involves comparing the purchase experience and perceived expectations with the customers' post-purchase experience (Ahmad et al., 2017). Given that quality is a precursor to satisfaction (Bai et al., 2008), it is imperative for e-commerce organizations to develop top-notch websites that offer a superior online experience in order to attract and retain customers in the e-retail market (Hasanov & Khalid, 2015). Different studies (Hsu et al. (2015); Ihsan et al. (2020); Shim & Jo (2020)) have investigated the relationship between website quality and satisfaction, so this hypothesis is also raised in this research:

H2: Website quality has a significant relationship with satisfaction.

Website quality and loyalty

Loyalty can be understood as the willingness of consumers to re-spend their money on offers (which can be products or services) from the same company (Wilson, 2020). Customer loyalty is a combination of the customer's intended probability to buy from the same company again in the future and the probability of buying a company's products or services at different prices (price tolerance) (Morgeson et al., 2023). Loyalty is an important part of an e-commerce system because it means that customers will return to a website again in the future (Ihsan et al., 2020). Previous studies have shown that when consumers recall an enjoyable shopping experience on a shopping website, their willingness to revisit the website increases (Tsao et al., 2016). Loyalty is the customer's willingness to maintain a stable

relationship in the future and engage in repeated behavior of visits and/or purchases of products or services online, using the company's website as the first choice among alternatives (López-Miguens & Vázquez, 2017). Website quality evaluates the quality of the content contained on the website in a number of ways, such as navigation, beauty, functionality, and so on. If it is fulfilled, then the user will certainly be interested in using it repeatedly. It can be to fulfill what you want from the website user (Putra & Idris, 2020). Different studies (Garcia-Madariaga et al. (2018); Wilson (2020); Sun et al. (2022)) have investigated the relationship between website quality and loyalty, so this hypothesis is also raised in this research:

H3: Website quality has a significant relationship with loyalty.

Research Methodology

In this section, the literature search method, inclusion criteria, coding, and analysis procedures will be examined.

Literature review: In order to identify the relevant studies, the websites of some credible scientific journals were first reviewed (literature search). Then, "website quality" was searched in scientific databases such as ScienceDirect, Emerald, Springer, Sage, Doaj, and Google Scholar. In addition, the references of the papers selected for the meta-analysis were also searched in order to find the relevant papers. In cases where the papers did not report the required data (such as the sample size or the correlation index), an attempt was made to obtain them by sending emails to the authors. In terms of time, the current study covers the papers published from 2004 to November 2023 (a period of 20 years). There were 969 research articles in total that were downloaded. This figure does not account for the completed reference articles or the emails sent to the writers; it only represents the articles that have been downloaded through keyword searches.

The inclusion criteria: The inclusion criteria were as follows: 1. the language of the paper must be English; 2. the research must be

quantitative; 3. the study must not be repetitive; 4. there must be a correlation between website quality and trust, satisfaction and loyalty.

Coding: Two separate coders were used to encode the data. The rate of agreement was 95%. Afterward, the data of both coders were reviewed and their differences were resolved by further study and discussion.

The analysis procedures: Due to the fact that the correlation index is reported in most management and marketing studies, it was used as the input for the software to be converted into the effect size. In studies in

which indices other than the correlation index were reported, the reported index was converted into a correlation index if it had the ability to be converted. The classic fail-safe N was also used for publication bias.

Research Findings

The studies which are meeting the inclusion criteria for the meta-analysis is 49, 68, and 29 studies have reported the effect size of WQ-T, WQ-S, and WQ-L respectively.

Figure 1, 2, and 3 show the funnel diagrams of WQ-T, WQ-S, and WQ-L studies respectively.



Figure 1. Funnel diagram for WQ-T

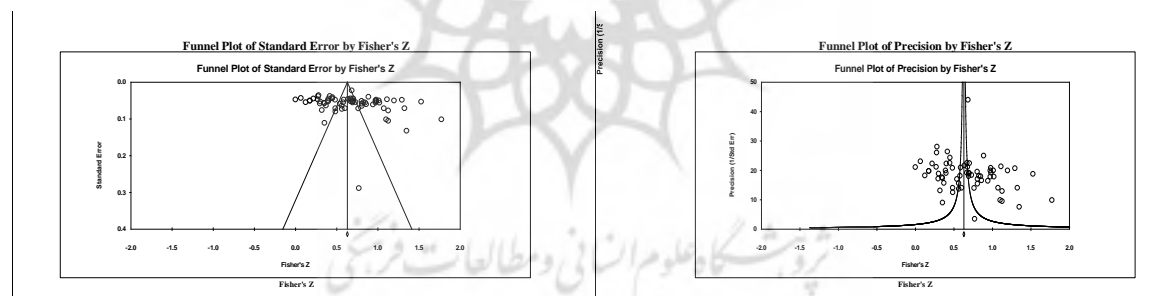


Figure 2. Funnel diagram for WQ-S

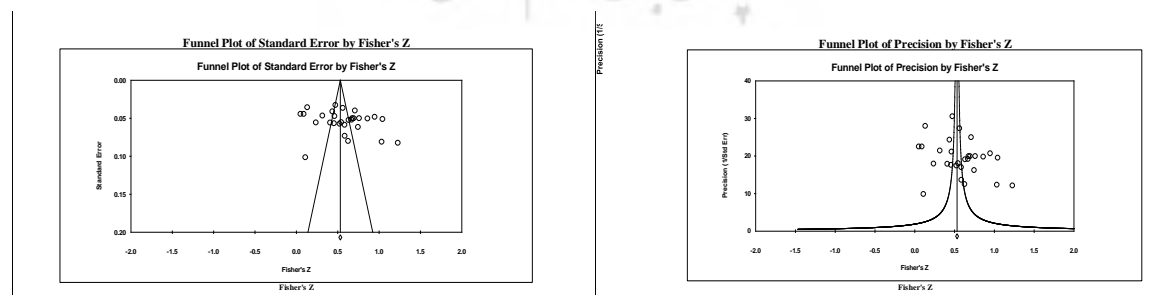


Figure 3. Funnel diagram for WQ-L

The classic fail-safe N index was used to evaluate the publication bias and the results are shown in Table 1.

Table 1.

The classic fail-safe N

Hypothesis	Number of missed studies	Number of observed studies	alpha Z	tail	alpha	P-value observed studies	Z-value observed studies
H1	89872	49	1.95996	2	0.05	0.000	83.96136
H2	72908	68	1.95996	2	0.05	0.000	98.85216
H3	25173	29	1.95996	2	0.05	0.000	57.77797

As shown in Table 1, for WQ-T, WQ-S, and WQ-L studies, there should be 89872, 72908, and 25173 studies with an average effect size of zero for the results to change, respectively. These numbers are very significant compared to the 49, 68, and 29 studies for WQ-T, WQ-S, and WQ-L, respectively. Given that there are more missing studies for each hypothesis, as indicated by the formula $5k+10$, where k is the number of published studies. Using this formula, 255, 350, and 155 for the first through third hypotheses were found,

respectively. This is a significant reduction from the number of missing studies for each hypothesis. Hence, it can be concluded that there is no publication bias in the data of the current study. Before analyzing the total effect size, it must be determined which of the measurement models (the fixed effect or the random effect) should be used first. For this purpose, it should be determined whether the studies are homogeneous or heterogeneous. In this regard, Table 2 shows the results of the Q test and I^2 index.

Table 2.

Q test and I^2 index

Hypothesis	I^2	Result	Q	P-value	Result
H1	97.587	Heterogeneous	1988.903	0.000	Heterogeneous
H2	97.573	Heterogeneous	2760.889	0.000	Heterogeneous
H3	96.647	Heterogeneous	835.133	0.000	Heterogeneous

According to Table 2, both indices (Q test and I^2 index) show that the studies are heterogeneous for two hypotheses.

Therefore, the random-effects model should be used to calculate the total effect size. Table 3 shows the model in random mode.

Table 3.

Total effect size

Hypothesis	Number of studies	Effect size	Lower Limit	Upper Limit	Z-value	P-value	Result
H1	49	0.555	0.491	0.613	13.917	0.000	Confirmation
H2	68	0.591	0.536	0.641	16.589	0.000	Confirmation
H3	29	0.516	0.439	0.586	11.168	0.000	Confirmation

As shown in Table 3, the effect sizes of WQ-T, WQ-S, and WQ-L are positive and equal to 0.555, 0.591, and 0.516, respectively.

Considering the heterogeneity of the studies, the moderating variables in the relationship among WQ-T, WQ-S, and WQ-L should be examined. For this purpose, the

moderating roles of the variables 'sample size' and 'year of publication' were investigated. The meta-regression method was used in order to detect the moderating role of year of publication and sample size as quantitative-continuous variables, as shown in Table 4.

Table 4.

The results of the moderation test

Moderating variable		Effect size	Standard error	Lower Limit	Upper limit	Z-statistics	P-value
WQ-T							
Year of Publication	Slop	-0.02213	0.00130	-0.02469	-0.01958	-17.00033	0.00000
	Intercept	45.30844	2.62495	40.16362	50.45325	17.26066	0.00000
Sample Size	Slop	0.00008	0.00000	0.00008	0.00009	22.58598	0.00000
	intercept	0.55293	0.00889	0.53551	0.57036	62.19452	0.00000
WQ-S							
Year of Publication	Slop	0.01317	0.00168	0.00989	0.01646	7.85833	0.00000
	Intercept	-25.96238	3.38385	-32.59460	-19.33016	-7.67244	0.00000
Sample Size	Slop	-0.00005	0.00001	-0.00008	-0.00002	-3.54522	0.00039
	intercept	0.65677	0.01007	0.63704	0.67651	65.22468	0.00000
WQ-L							
Year of Publication	Slop	0.01685	0.00291	0.01116	0.02255	5.79837	0.00000
	Intercept	-33.47724	5.86519	-44.97281	-21.98167	-5.70778	0.00000
Sample Size	Slop	-0.00044	0.00004	-0.00052	-0.00035	-9.81086	0.00000
	intercept	0.74651	0.02382	0.69982	0.79320	31.33647	0.00000

The p-value was less than 0.05 for the sample size and the year of publication in all hypotheses, confirming the moderating roles of the sample size and the year of publication. As can be seen in Table 4, an increase in the year of publication led to a decrease in the effect size of WQ-T studies but an increase in the effect size of WQ-S and WQ-L studies. Additionally, with an increase in the sample size, the effect sizes of WQ-T studies increased, but the effect sizes of WQ-S and WQ-L decreased.

Discussion

This study extensively examined the significant behavioral outcomes of website quality, such as customer trust, satisfaction, and loyalty, in light of the increasing prominence of e-commerce in the 21st century and the extensive research conducted on website quality. For this purpose, relevant research was gathered from various scientific databases and examined following a coding process. The findings showed that among 49 studies related to WQ-T, Yadav & Mahara (2017) study with 0.036 and Bagas Wicaksono et al. (2022) study with 0.863, respectively, have the lowest and highest effect size. The combined effect size of WQ-T studies was also 0.555. The findings of the WQ-S studies also showed that among the 68

eligible studies, Hsu et al. (2016) study with 0.000 and Fitriana (2022) study with 0.944, respectively, have the lowest and highest effect sizes. Moreover, the combined effect size of the website quality and satisfaction studies was 0.591. Regarding WQ-L studies, among the 29 studies, Kumar Roy et al. (2014) and Garcia-Madariaga et al. (2018), with 0.090 and 0.842, respectively, have the lowest and highest effect sizes. Furthermore, the combined effect size of the WQ-L studies was 0.516. Website quality has the greatest effect size on customer satisfaction and the least effect size on customer loyalty, according to these findings. This implies that while a website may significantly impact customer satisfaction, an exclusive emphasis on website quality is insufficient to foster maximum customer loyalty. Undoubtedly, augmenting customer satisfaction can foster repeat patronage and consequently increase customer loyalty. Intriguing findings were also uncovered regarding the correlation between the quality of a website and its credibility. Previous research has recommended increasing investment in website quality improvement as a means to enhance customer trust. However, the findings of this study did not demonstrate a comparatively significant effect size. This indicates a weaker-than-anticipated

correlation between website quality and trust. It seems that the quality of the website cannot guarantee trust. It seems that customers' experiences can be a decisive factor in this field, which means that customers usually fall into the trap of fraudsters who designed a website similar to the original website, and in fact, the quality of that website was high. It is possible that if a website has low quality, customers will hardly trust it, and most likely they will check its credibility in various ways before making a transaction with that website, but in the case of high-quality websites, customers take less action to evaluate their credibility, which can open the way for abuse of their trust. Therefore, with the increase in customers' experiences of such events, they consider the relationship between website quality and trust to be very strong. Therefore, with the increase in customers' experiences of such events, in practice, they do not consider the relationship between website quality and trust as much as it is imagined in theory. In this regard, the findings of Mou et al. (2020) showed that the quality of the alternative website can have a negative relationship with customers' trust in both the provider and the website.

In addition, due to the heterogeneity of the effect sizes, moderator variables were investigated, and it was found that an increase in the year of publication led to a decrease in the effect size of WQ-T studies but an increase in the effect size of WQ-S and WQ-L studies. Additionally, with an increase in the sample size, the effect sizes of WQ-T studies increased, but the effect sizes of WQ-S and WQ-L decreased. These results also indicate that the trend of studies has been such that, in recent years, the effect size of WQ-T has decreased. In fact, the high quality of websites has not been able to lead to an increase in trust. Perhaps the reason can be seen in the increasing development of technology in order to easily create and design high-quality websites, and even, in some cases, similar to an original website, for the purpose of fraud. This is despite the fact that in recent years, the WQ-S and WQ-L have increased, and this indicates that more

investment should be made in website quality to increase customer satisfaction and loyalty. Regarding the role of the number of samples, the findings indicate that in larger samples, the WQ-T was increasing, while the effect size of the WQ-S and WQ-L was decreasing. It appears that larger samples can indicate more well-known websites, and this has reduced the possibility of fraud and falling into the trap of fraudsters and has led to an increase in their trust, while the expectations of customers from such websites are also higher, and even if compared to other websites, even if they have high quality, it is still not enough from the customers' point of view, and this has led to a decrease in customer satisfaction and, as a result, a decrease in their loyalty.

Practical Implications

Considering that satisfaction had the most positive effect size with website quality, therefore, suggestions should be made to increase customer satisfaction from websites. One of the most important things that can increase customer satisfaction with a website is its visual appeal. To achieve this objective, it is recommended to utilize high-resolution images and enhance the typographical elements of the website. Furthermore, it is imperative to employ an appropriate amalgamation of hues that aligns with the nature of the website as well as the services and products it provides. The website should incorporate sufficient white space to achieve visual equilibrium and clearly delineate the spacing between the text and the image. In addition, for increasing satisfaction, the navigation of the website is also important and to some extent it shows the ease of use of that website. Adding information such as product usage guides, providing the possibility of comparing similar products, and also giving expert consultation on the website can be other factors that increase customer satisfaction. Moreover, website designs in different languages, especially for websites that have international customers. Also, 24-hour response on the website can

also be effective in increasing customer satisfaction.

In order to improve customers' loyalty, it is suggested that websites consider incentives for customers to return. This can include offering rewards not only to regular customers who make a lot of purchases from the website, but also to potential customers who visit your site regularly. In addition, active customers can be identified by offering points to some customer activities, including commenting, scoring products, and then by rewards, including assigning discount codes to them and informing them of the availability of products earlier, in order to promote customer loyalty. In addition, gamification can also be used to improve customer loyalty to the website and to design the website in such a way that customers are more interested in staying on the website and engaging in activities to earn as many points as possible, similar to a video game. To achieve this, website designs should incorporate personalized elements and structure their content to resemble the progression of a computer game. This approach ensures that the sites can effectively captivate and retain a diverse range of customers.

To enhance consumer trust in websites, implementation of strategies such as facilitating the exchange of customer experiences, offering diverse communication channels (including physical and virtual platforms), and providing transparent information regarding the company's commitment to safeguarding customers' privacy and preventing the disclosure of their information to third parties are recommended. Furthermore, in order to enhance customer confidence, the website may feature the endorsements of reputable and administrative bodies. Furthermore, website owners should possess the capability to educate and enlighten their visitors about essential tactics that online fraudsters utilize to deceive customers. This involves instructing individuals on how to distinguish between counterfeit and authentic products,

as well as how to recognize legitimate payment gateways from deceptive ones.

Limitations and future research

While the current research is thorough and has explored various scientific databases, it is recommended that future researchers in the field of e-commerce conduct a meta-analysis on the effects of website quality specific to their own countries. This analysis should also include research conducted and published in their country's language, and the results should be compared to the findings of the present research. In addition, it is suggested that researchers conduct a meta-analysis of the antecedents of website quality in e-commerce. It is also suggested to examine and analyze some of the conceptual models in which website quality is one of the variables in the form of meta-analysis.

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