SERIAL MEDIATION OF PERCEIVED USEFULNESS AND EWOM ADOPTION IN VIRTUAL COMMUNITIES AND THE MODERATING EFFECT OF GENDER

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Abstract

Purpose – This study analyzes the adoption behavior of eWOM information from the consumer's perspective. In virtual communities, this study examines the serial mediation of perceived usefulness and adoption of eWOM between eWOM characteristics (credibility, quality, and vivacity) and the intention to visit a tourist destination and gender as a moderator. This study makes a significant theoretical and practical contribution by the purpose of an integrative model, according to the ELM model, and by examining the moderating effect of gender.
Design/Methodology/Approach – This study tests the hypothesis using an experimental scenario simulation method. Signals embedded in various components of the eWOM (stimuli/ scenarios) were used, such as interactivity with the message (Like number, comment, sharing) or the content of the message (Text, Visual, Video). The new model (based on the ELM model) was validated by PLS-SEM based on an online survey of 548 members of the virtual consumption communities where content shared is about tourism and hospitality, tourism experiences, and recommendations of Algerian tourist destinations.
Findings – The results confirm that perceived usefulness and adoption are two serial mediators between the relationship between eWOM characteristics and visit intention. Finally, gender moderates the indirect effect between eWOM quality and the intention to visit.
Originality of the research – This study proposes to develop an integrative model by testing the serial mediating effects of perceived usefulness and information adoption for the first time regarding the influence of the three eWOM characteristics on behavioral intention and investigates the role of gender as a moderator.
Keywords Perceived credibility, eWOM quality, Vivacity, Perceived usefulness, eWOM Adoption, Gender

INTRODUCTION

According to Bansal & Voyer (2000), eWOM conversations refers to the basic information transfer between two parts, those who send the message and those who receive it. While WOM could be obtained directly from family, friends, or acquaintances, eWOM relies on anonymous opinions expressed though strangers' comments, which can question the credibility of the eWOM source (Lo & Yao, 2019. However, information's influence may differ from one individual to another; the same content may evoke various concepts among the recipients. (Chaiken & Eagly, 1976; Cheung et al., 2008). Researchers have studied the information adoption process to understand how people assimilate the information they receive (Nonaka, 1994; Hwang, 2010; Assaker, 2019).

However, imagining that all eWOM messages influence behavioral intentions is not easy. Due to the many eWOM messages that Internet users are exposed to, they have to analyze and filter the messages before adopting them. Literature on this complex mechanism linking eWOM and behavioral intentions is somehow limited. Hence, Information Adoption Model (IAM) proposes to define how individuals are impacted by information on web-based communication.

Prior studies have tested this model in a specific context: online chat forums (Cheung et al., 2008) and social media (Shu & Scott, 2014). Therefore, this research aims to translate this model to eWOM studies.

The choice of the IAM model is justified by the fact that this research focuses on eWOM in virtual communities on social media. Four dimensions of IAM were selected: The Quality of information, its Credibility, Usefulness, and Adoption. Therefore, this research aims to enrich the IAM model by considering consumers' behaviors toward information and analyzing the mediating effects of perceived usefulness and adoption on behavioral intentions toward information. Our model then allows us to understand the variables taken into account by the message receiver to process the information and how this information can influence adoption intentions. In addition, other extraneous variables can be mobilized to refine and better understand the indirect relationships between eWOM characteristics and the intention to visit a destination. Gender is one of these variables. In this sense, this research proposes to develop an integrative model by testing the moderating effect of gender on the indirect relationships between perceived usefulness and adoption on behavioral intentions.

The analysis of the moderating role of gender (as opposed to other socio-demographic factors) on tourist behavior is now a recognized field of research. In particular, several studies have concentrated on the gender-based analysis of the perception and use of online information in the context of hospitality and online tourism: online tourism purchase (Escobar-Rodriguez et al., 2017), mobile tourism purchase (Tan & Ooi, 2018) and hotel applications (Kim, 2016). Furthermore, Kang et al. (2018) identified the contextual and inconsistent influences of gender on technology adoption that largely depend on the technology or application used. However, prior studies exploring the moderating effect of gender in terms of tourists' adoption of online reviews remain limited (Ukpabi & Karajaluoto, 2017).

This study addresses this shortcoming in the literature. To our knowledge, no previous study has explored whether gender moderates the indirect relationships between eWOM characteristics and intention to visit a destination (via perceived usefulness and adoption of eWOM messages, key variables recognized in the construction of the IAM model).

This research, therefore, has three main objectives: (1) to test the IAM model applied to eWOM by considering consumer information behaviors as well as behavioral intentions; (2) to investigate for the first time the serial mediating effects of perceived usefulness and information adoption in terms of the influence of the three eWOM characteristics on behavioral intention ; (3) to test factors that may influence the usefulness and adoption of eWOM messages in virtual communities, specifically, it investigates the role of gender as a moderator. The paper is divided into three parts. The first part deals with the literature review and its research hypotheses. The second part presents the methodology deployed, while the third part presents and discusses the results using PLS-SEM and multigroup analysis. Finally, theoretical contributions, managerial implications, and avenues for future research close this contribution.

1. LITERATURE REVIEW

A presentation of the eWOM components addressed in our study first provides a frame of reference for our approach. The mediating role of perceived usefulness and the research model are then described.

1.1. The quality of eWOM messages

Rieh (2002) defined quality as the standard that measures excellence and truth. Taylor (1986) associated quality with value and emphasized that quality's essence lay in the user's benefits. Wang & Strong (1996) believed that information was also a product and should meet consumer demand. The ELM model also explains the notion of argument quality or message validity (Sussman & Siegal, 2003). Central processing (ELM) often uses argument quality to measure the strength or plausibility of arguments (Sussman & Siegal, 2003; Zhang & Watts, 2008). Argument quality can also include checking for information completeness, consistency, or accuracy (Sussman & Siegal, 2003).

In virtual communities, consumers can judge the validity of information by checking whether the arguments make sense relative to common sense. If they are perceived as quality, the message receiver will trust that information and thus adopt the message or information (Zhang & Watts, 2008; Hussain et al., 2017; Leong et al., 2019; Nechoud, 2019). Several studies have highlighted that quality online reviews have a positive effect on the purchasing intentions of consumers. (Lee & Shin, 2014). As a result, we postulate that the quality of eWOM messages in virtual communities can be one of the factors influencing consumer purchase intentions. Information quality, in this context, predicts the perceived usefulness of the information, which in turn influences message adoption (Nechoud, 2019; Song et al., 2021; Leong et al., 2022).

1.2. Perceived credibility of eWOM messages

The topic of credibility assessment in this study refers to the online recommendation or critique itself, not to the confident beliefs about a person or organization. According to Wathen & Burkell (2002), the receiver's judgment of the message's credibility is an essential preliminary step in the information persuasion process. Thus, if people tend to believe information from a highly credible source, they will accept it more readily; therefore, if the source is perceived as less credible, the receiver is less likely to accept that information and use it to make purchase decisions (Tseng & Fogg, 1999).

In this contribution, the model was based on the credibility of the information rather than the source's credibility. In browsing information, receivers frequently do not recognize the profile of the message's sender; as a result, they cannot determine his/her level of expertise on the topic. Although some websites have provided rating systems to check the credibility of the sender, the credibility of the source has not been checked to any great extent. Therefore, this study assumes that their publications' content can determine an issuer's expertise. For example, when sharing an experience in a Facebook group, administrators evaluate the information content of shared posts.

Moreover, members are generally interested in the publication date of the post and updated information reflecting environmental changes and engagement (sharing, commenting, interaction) with the post. In general, if a recipient thinks that online reviews

have less credibility, they often prefer to resist the persuasiveness of eWOM (Song et al., 2021; Leong et al., 2022). Therefore, consumers' views on message credibility are very important and effective in terms of online message acceptance (Ghidouche et al., 2018, Nechoud et al., 2021). This view will be echoed in this research.

1.3. eWOM Message vivacity

For the eWOM components, the concept of message vivacity was retained in this research. According to Marks (1972), vivacity combines clarity and luminosity. The brighter the appearance, the closer the real world appears. Steuer (1992, p. 81) defined vivacity as *"the representational richness of a mediated environment as defined by its format features, that is, the way in which an environment presents information to the senses"*. So it is the level of richness in the information that the media environment brings to the human senses. Rich content can take many forms: text, graphics, images, and video. In virtual communities, multimedia tools such as video and photography can be seen as tools to increase vivacity by increasing the richness of the experience. Mountford (1990, p. 131) writes: "*Tomorrow's personal computers have the potential to create animations rich enough to allow users to actually interact with dramatic dynamic events.*" Content described as vivid should be rich in sensors that appeal to multiple senses.

While browsing, users are more likely to read content based on the attractiveness of the sender's textual descriptions and images. Chen et al. (2022) showed that the influence of eWOM is stronger when it is in the form of text in combination with images. Through visual/audio-visual stimuli, receivers are convinced by the sender's experiences. Inspired by their imagination, Internet users can have the impression of living in the same environment described by the source. Comprehensive details, attractive visuals, and excellent language competencies create an appealing atmosphere for Internet users (Nechoud, 2019). In other words, clear and vivid content could enhance the value of information and enable users to adopt it.

2. RESEARCH MODEL AND HYPOTHESIS DEVELOPMENT

Figure 1 illustrates the proposed research model. It also highlights the mediating effect of perceived usefulness and the moderating role of gender.

2.1. Mediating effect of perceived usefulness and eWOM adoption

Regarding the role of eWOM messages as a credible factor, we focus on the concept of perceived usefulness. This concept forms the cornerstone of the Information Adoption Model (IAM). The IAM model is adapted to study the utility of online information that can impact the choice decision (Ghidouche et al., 2018, Nechoud et al., 2021). Information usefulness refers to how the acquirement and use of the new information could be beneficial in enhancing performance according to the user's perception (Bailey & Pearson, 1983; Cheung et al., 2008).

Perceived usefulness is *"the degree to which a person believes that using a particular system would enhance his or her job performance"* (Davis, 1989, 320). According to Deutsch & Gerrard (1955) and Sussman & Siegal (2003), greater perceived usefulness of information leads to greater information adoption. For example, when users believe that the information viewed is helpful in planning holidays, the intention to adopt the message information increases. Message adoption is thus the measure that individuals recognize the information as useful (Zhang & Watts, 2008).

On social networks, Internet users are confronted with much eWOM information. Therefore, they might be more likely to adopt it when they find useful information (Chu & Kim, 2011).

In this sense, Cheung & Thadani (2012) proposed a conceptual model incorporating the indirect effect of perceived usefulness of eWOM messages between information quality and message adoption and the mediating role of perceived credibility between eWOM perceived credibility. Several studies have analyzed the indirect effect of perceived usefulness between eWOM messages and their adoption (McKnight & Kacmar, 2007; Cheung & Thadani, 2012; Nechoud, 2019).

When gathering information from virtual communities, users usually use some signals to evaluate the credibility of shared messages, such as the number of shares or comments. Thus, it is legitimate to postulate that when the content of eWOM messages is more reliable, credible, lively, and of high quality, their usefulness is improved. As a complement to the IAM model and in line with the work of (McKnight & Kacmar, 2007; Cheung & Thadani, 2012; Nechoud, 2019), it seems sensible to test the mediating role of the perceived usefulness. Therefore, Hypothesis 1 is expressed as:

H1: Perceived usefulness mediates the relationship between eWOM characteristics ([a] Perceived Credibility, [b] eWOM Quality, and [c] Vivacity of content) and eWOM adoption.

However, eWOM message adoption is how individuals engage when using online information or reviews about products, brands, or services (Lee & Youn, 2009). It then represents an indicator of content acceptance (Zhang & Watts, 2008). Subsequently,

message adoption can translate into a purchase decision (Sardar et al., 2021; Munawar et al., 2021).

Whether intentionally or not, social media users are exposed to a considerable amount of information about eWOM, and prior research has shown that this information influences consumers' purchasing intentions (Leong et al., 2022). According to Sardar et al., (2021), the influence of the perceived usefulness of eWOM messages improves behavioral intention with the mediation effect of the adoption of eWOM.

Therefore, we propose Hypothesis 2:

H2: eWOM message adoption mediates the relationship between the perceived usefulness of these messages and the intention to visit the destination.

Prior studies suggest the potentially positive indirect effect between perceived usefulness on the relationship between eWOM characteristics and the intention to visit a destination (Ghidouche et al., 2018, Nechoud et al., 2021). Also, according to IAM, perceived usefulness impacts information adoption. In other words, eWOM messages perceived as highly useful may contribute to message adoption and increase the intention to visit tourist destinations recommended by virtual community members. We also believe that information adoption should mediate the relationship between eWOM features and the intention to visit a destination.

Recent studies have examined how eWOM adoption could mediate the impact of eWOM adoption antecedents (quality, consumer attitude, credibility, usefulness, and needs) on the purchase intention of customers (Sandar et al., 2021).

We thus anticipate that when searching for information about a tourist destination in virtual communities, the more useful the shared eWOM message is perceived to be, the more it will be adopted, which will increase the intention to visit the destination recommended by the community members. We propose simultaneously analyzing the multiple (serial) mediation effects of perceived usefulness and eWOM adoption that explain the relationship between eWOM characteristics and visit intention. Thus, we hypothesize:

H3: Perceived usefulness and adoption of eWOM messages are two serial mediators between eWOM characteristics ([a] Perceived Credibility, [b] eWOM Quality, and [c] Vivacity of content) and intention to visit the destination.

2.2. Moderating effect of gender

Gender is a crucial determinant of destination choice decisions and future purchase behavior (Han et al., 2017; Wang et al., 2016). Meyers-Levy & Loken (2015) found significant differences between men and women in the virtual world, which they attribute to social, cultural, psychological, and environmental factors. These results are consistent with the claim that men and women have different eWOM messages and behavioral intentions (Dittmar et al., 2004; Rodgers & Harris, 2003).

Furthermore, Escobar-Rodriguez et al., (2017) have confirmed the significance impact of information credibility on the online purchase intentions of individuals, they found that the concerned impact is more significant for women than for men. While in the online purchase context, Tan & Ooi (2018) failed to validate the moderating role of gender on the relation between trustworthiness and expertise, and individual's intention to purchase.

In contrast, recent studies have found that the relationship between perceived usefulness and the behavioral intention was stronger for men (Mandari & Chon, 2018, Acheampong et al., 2018), while photos/videos on social media more often influenced women's decisions than men's (Karatsoli & Nathanail, 2020).

Moreover, researchers studying tourism and hospitality consumer behavior investigated the moderating role of gender on the relationship between eWOM and a tourist's future behavior (Abubakar et al., 2017; Assaker, 2019). Numerous research studies have shown the impact that gender can have on the consumer's perceived credibility of the message, attitude toward the product being evaluated, and consumer purchase intention (Tabbane & Hamouda, 2013). Greater purchase intention is revealed much more among women than men (Fan & Miao, 2012). Moreover, according to the findings of a study conducted by Bae & Lee (2011) involving online reviews, the effects of online reviews on purchase intention were greater for women than for men.

According to Assaker (2019), perceived usefulness was the most important determinant of travel information use on travel-review websites among men, but it was not significant among women. Thus, the moderating role of gender on eWOM adoption/ use is quite debatable and context-dependent and needs an in-depth attention in the case of virtual communities.

In this research, we consider that gender may moderate indirect relationships between eWOM characteristics and intention to visit a destination via perceived usefulness and adoption of eWOM messages. Accordingly, it seems legitimate to formulate Hypothesis 4:

H4: Gender moderates the indirect relationship between eWOM characteristics ([a] Perceived Credibility, [b] eWOM Quality, and [c] Vivacity of content) and intention to visit.

Figure 1: **Conceptual model**
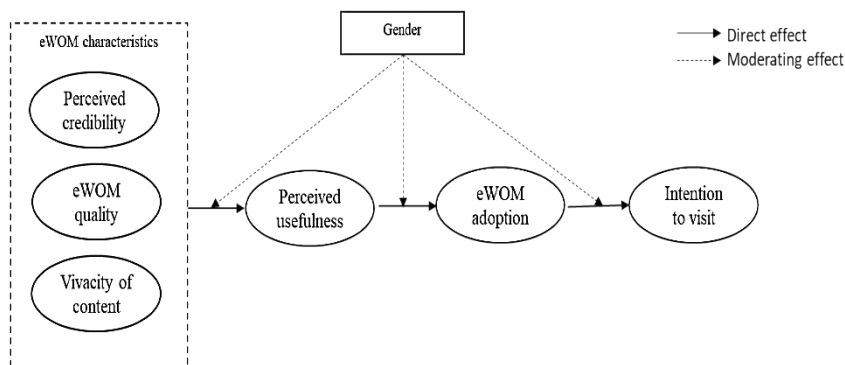
3. METHODOLOGY

3.1. Survey instrument

Our research model consists of 6 variables: three explanatory variables (independent variables), one variable to be explained (dependent variable) and two mediating variables. All variables are measured subjectively using 5-point Likert-type multi-item scales (Strongly disagree to Strongly agree) or semantic difference scales (Message adoption variable). Regarding the components of the eWOM selected for this study, on the one hand, the scale of Ayeh et al. (2013) and Ponte et al. (2015) was chosen for the measurement of perceived credibility in particular for its speed of implementation and its proven psychometric qualities. On the other hand, the perceived quality of eWOM messages was measured through the scale adapted by Erkan & Evans (2016). Finally, for the variable vivacity, we used six statements adapted from the scale by Babin & Burns (1998), Gavard-Perret & Helme-Guizon (2003), and Yim et al. (2017).

For the mediating variables, the perceived usefulness scale (Bhattacherjee, 2001; Casaló et al., 2011; Wu & Chen, 2005) was chosen, given its adaptation to the specificities of our field of investigation. As for the variable message adoption, it was apprehended by the scale developed by Wu & Shaffer (1987) and used by Susman et al. (2003) and Huang & Kuo (2014) in the development probability adoption model to test online consumers' willingness to purchase food products. Finally, to measure the intention to visit, we adopted the scale of Lam & Hsu (2006), considering its psychometric qualities. All the items of the scales used in our study are presented in Appendix A.

3.2. Data collection

This study used a quasi-experimental design to test the hypotheses, as many studies on social media and eWOM communications have manipulated a media type to apply an experimental stimulus (Darley & Smith, 1993; Carr & Walther, 2014). Our experiment used a six-scenario design (text, photos, video, comments) (stimulus) to identify the effects of eWOM in virtual communities on message adoption and subsequent behavioral intentions (intention to visit). In our case, community members were exposed to experiment as experimental stimuli and were put in a situation where they had to choose an unknown Algerian tourism destination. Comments and messages were manipulated to identify how community members perceive destinations and adopt messages and the influence of stimuli on their intention to visit the destinations in question. An online survey integrated the constructed scenarios.

To answer our research questions, it is important to recall several restrictions. The scenarios are presented without any intervention of the characteristics of the sender of the message, nor the name of the community, as we are only interested in the messages and their characteristics. In addition, scenarios are used in six Algerian destinations with different implications, and we have taken care not to interfere with the name of a known destination.

The population studied represents all the members of virtual communities whose main theme is sharing around tourism and travel in Algeria. We designed and administered our questionnaire using Google Forms, guaranteeing anonymity. The link to the questionnaire was shared in the virtual communities of tourism and travel. This approach also allows us to reach "hard-to-reach" populations. Thus, data collection was based on a convenience sample. Respondents were recruited online, and a series of filter questions ensured that they could answer questions about tourist destinations and the use of virtual communities in choosing a destination. The questionnaires were administered over five months, from March to August 2021, allowing us to collect 548 usable questionnaires for analysis. Our sample size is considered satisfactory to test our model regarding the thresholds recommended by Kline (2015). Table 1 details the demographics.

Table 1: **Sample Demographics (N=548)**

Categories	N	(%)
Gender		
Men	243	44.3
Women	305	55.7
Age		
18-25	192	35.0
26-35	223	40.7
36-45	82	15.0
46-55	43	7.8
> 56	8	1.5
Regions		
East	224	40.9
Center	290	52.9
West	25	4.6
South	9	1.6
Level of education		
Secondary and less	26	4.8
Graduate/postgraduate	522	95.3
SCP		
Manager	18	3.3
Business Owner	30	5.5
Employee	258	47.1
Retired	12	2.2
Student	217	39.6
Unemployed	13	2.4

According to our study, our sample is represented by 55.7% women and 44.3% men, and more than 52% of the surveyed population resides in the country's central region. Moreover, 75.7% of the respondents are 35 years old or younger. Finally, more than 95% of the surveyed population have a higher education, and 52.5% are employees. We used PLS-SEM (Partial Least Square- Structural Equation Modeling) (Ali et al., 2018. Hair et al., 2017) to estimate the measurement and structural models through Smart PLS version 3.3.2 (Ringle et al., 2015). PLS-SEM is methodologically well-established (Ali et al., 2018) and is justified because two variables in our conceptual model do not follow a normal distribution (Vivacity and Credibility). According to (Henseler et al., 2016a), PLS maintains the assumption of the model's quality with non-normal data. PLS-SEM is justified because our research aims to develop a theory by exploring the indirect effect of eWOM characteristics on eWOM adoption through perceived usefulness and the indirect effect of perceived usefulness on intention to visit through eWOM adoption. The PLS-SEM MGA (Multi-Group Analysis) allows for exploring the moderating role of gender in the relationship between eWOM characteristics and intention to visit.

Table 2: **Measurement properties**

Construct	Item	Mean (SD)	Loading	Cronbach's α	CR	AVE
Credibility (CRED)				0.826	0.877	0.588
	Cred_1	3.85 (1.08)	**0.790**			
	Cred_2	3.70 (1.15)	**0.783**			
	Cred_3	3.61 (1.18)	**0.772**			
	Cred_4	3.32 (1.29)	**0.769**			
	Cred_5	3.46 (1.18)	**0.719**			
Quality (QUA)				0.910	0.933	0.736
	Qua_1	3.45 (0.85)	**0.851**			
	Qua_2	3.36 (0.94)	**0.818**			
	Qua_3	3.61 (0.84)	**0.882**			
	Qua_4	3.64 (0.85)	**0.893**			
	Qua_5	3.36 (0.89)	**0.843**			
Vivacity (VIV)				0.884	0.912	0.633
	Viv_1	3.97 (0.87)	**0.838**			
	Viv_2	3.74 (0.98)	**0.847**			
	Viv_3	3.55 (0.99)	**0.781**			
	Viv_4	3.68 (1.00)	**0.727**			
	Viv_5	3.91 (0.90)	**0.766**			
	Viv_6	3.86 (0.90)	**0.808**			
Perceived usefulness (PU) (R² =0.334)				0.896	0.935	0.828
	Pu_1	3.70 (0.93)	**0.901**			
	Pu_2	3.85 (0.91)	**0.925**			
	Pu_3	3.83 (0.96)	**0.904**			
Adoption (AD) (R²=0.167)				0.737	0.849	0.654
	Ad_1	3.35 (1.07)	**0.721**			
	Ad_2	3.78 (0.99)	**0.868**			
	Ad_3	3.67 (0.90)	**0.829**			
Intention to visit (INT) (R²=0.112)				0.805	0.885	0.719
	Int_1	4.16 (0.85)	**0.850**			
	Int_2	3.76 (1.07)	**0.814**			
	Int_3	3.88 (0.97)	**0.879**			

4. RESULTS

4.1. Measurement Model Assessment

Initially, indicator reliability, internal consistency reliability, and convergent validity were evaluated, respectively, by the standardized indicator loadings, Chronbach's alpha, the composite reliability (CR), and the average variance extracted (AVE) (Henseler et al., 2009; Ali et al., 2018; Hair et al., 2019; Hair et al., 2021;). Table 2 indicates that both values of standardized indicator loadings are higher than the recommended cut-off (0.708) (Hair et al., 2021). Chronbach's alpha values and CR are above the 0.70 thresholds, indicating that internal consistency reliability was assessed (Hair et al., 2021). All the AVE values are greater than 0.5, demonstrating that convergent validity was established (Hair et al., 2021).

Next, discriminant validity was assessed using the Heterotrait-Monotrait ratio of (HTMT). We used the conservative 0.85 threshold value suggested by Henseler et al. (2016a). Further, we used the bias-corrected bootstraps confidence intervals (5 000 bootstraps resamples) to test whether the HTMT differs significantly from 1 (Hair et al., 2021). Table 3 indicates that

discriminant validity is ensured because all HTMT values are lower than 0.85 and significantly smaller than 1 using the 95% percentile bootstrap confidence intervals (Appendix B). Therefore, all constructs fulfilled the requirements for convergent and discriminant validity.

Table 3: **Discriminant Validity: HTMT Ratio**

	CRED	QUA	VIV	PU	AD
CRED					
QUA	0.317				
VIV	0.324	0.513			
PU	0.379	0.583	0.433		
AD	0.273	0.503	0.270	0.497	
INT	0.314	0.381	0.457	0.470	0.415

CRED: Credibility; **QUA**: Quality; **VIV**: Vivacity; **PU**: Perceived Usefulness; **AD**: Adoption; **INT**: Intention to visit

4.2. Structural model assessment

Four criteria will be used to analyze the structural model's evaluation: the coefficients of determination (R^2) of the endogenous constructs, the effect size (f^2), the predictive relevance (Q^2), and the size and sign of the path coefficients (β). First, an acceptable level of the R^2 depends on the research context (Ali et al., 2018; Hair et al., 2019). Hair et al. (2014) stated that an R^2 value of 0.2 is considered high in behavioral science. Table 2 indicates acceptable values for the R^2 of perceived usefulness ($R^2= 0.334$), adoption ($R^2=0.167$), and intention to visit ($R^2=0.112$). Second, the f^2 effect size values of 0.02, 0.15, or 0.35 indicate a weak, moderate, or strong effect size (Cohen, 1988), respectively. The predominant measure of predictive relevance (Q^2) measured using blindfolding procedures indicates the model's ability to predict the endogenous latent construct's indicators (Henseler et al., 2009; Hair et al., 2019). A value of Q^2 larger than zero indicates predictive of the endogenous variable (Hair et al., 2019). We obtain a Q^2 value of 0.141, 0.270, and 0.136 for the variables' adoption, perceived usefulness, and intention to visit, respectively. All the values are greater than zero, thus providing evidence for the predictive relevance of the model. Finally, we used the bias-corrected bootstrap confidence interval to test the statistical significance of the path coefficient estimates (Rasoolimanesh et al., 2019).

To test the hypotheses, we adopted the bootstraps approach with 5 000 resamples (Hair et al., 2014). The results in Table 4 show a positive and significant effect of the three characteristics of the eWOM on perceived usefulness. It appears that the effect of quality on perceived usefulness (β= 0.409; $f^2=0.190$, medium effect size) is stronger than the effect of credibility (β=0.167; $f^2=0.039$, weak effect size) and vivacity (β=0.171; $f^2=0.027$, weak effect size) on perceived usefulness. Moreover, the results confirm a meaningful positive effect of perceived usefulness on adoption with a medium effect size (β=0.409; $f^2=0.201$).

To test the significance of both the meditating effect and the serial mediating effect, we applied the product of the coefficients approach using the percentile bootstrap method and bias-corrected bootstrap confidence interval. The results confirm the significant indirect effect of perceived usefulness between credibility (β=0.409; $p<0.001$), quality (β=0.167; $p<0.001$), and vivacity (β=0.063; $p<0.01$) and adoption, in support of *H1* (Table 4). In addition, the results demonstrate the significance of the indirect effect of adoption between perceived usefulness and intention to visit (β=0.137; $p<0.001$).

Table 4: **Test of hypothesis**

Hypothesis		β	CIs Bias Corrected	Hypothesis test
	CRED-> PU	0.171***	[0.104, 0.246]	Yes
	QUA -> PU	0.409***	[0.323, 0.489]	Yes
	VIV -> PU	0.154**	[0.073, 0.236]	Yes
	PU -> AD	0.409***	[0.336, 0.484]	Yes
H1a	CRED -> PU -> AD	0.070***	[0.039, 0.105]	Yes
H1b	QUA -> PU-> AD	0.167***	[0.119, 0.221]	Yes
H1c	VIV -> PU -> AD	0.063**	[0.030, 0.096]	Yes
	AD -> INT	0.334***	[0.269, 0.409]	Yes
H2	PU -> AD -> INT	0.137***	[0.094, 0.182]	Yes

Note: **p<0.01; ***p<0.001
CRED: Credibility; **QUA**: Quality; **VIV**: Vivacity; **PU**: Perceived Usefulness; **AD**: Adoption; **INT**: Intention to visit

Furthermore, as recommended by Rasoolimanesh et al. (2021), we interpreted the type of mediation according to Zhao et al. (2010)'s approach. Results summarized in Table 5 show that the mediation effect of perceived usefulness respectively between quality and adoption, credibility and adoption, and the mediation effect of adoption between perceived usefulness and intention to visit are complementary (partial mediation) (Zhao, 2010; Nitzl et al., 2016). Additionally, we examined the VAF (variance accounted for) value, which describes the portion of the total effect attributed to the indirect effect (Henseler, 2021). The VAF values calculated are between 20% and 80%, reinforcing the presence of partial mediation (Hair et al., 2017), as shown in Table 5. The results indicate that 38.22% of the adoption's variance is explained by the mediation effect of perceived usefulness between quality and adoption. Moreover, the results indicate that the mediation effect of perceived usefulness between credibility and adoption and between vivacity and adoption is a full mediation (the indirect effect (ab) is significant, and the direct effect is not significant).

Table 5: **Mediation Analysis**

Path relation	Indirect effect	Direct Effect	VAF (%)	Mediation Type
CRED -> PU -> AD	0.070***	0.025ns	-	Indirect only (full mediation)
QUA-> PU-> AD	0.167***	0.270***	38.22	Complementary partial mediation
VIV -> PU -> AD	0.063**	-0.026ns	-	Indirect only (full mediation)
PU -> AD -> INT	0.137***	0.328***	29.46	Complementary partial mediation

Note: ns: Not significant, **p<0.01; ***p<0.001
CRED: Credibility; **QUA**: Quality; **VIV**: Vivacity; **PU**: Perceived Usefulness; **AD**: Adoption; **INT**: Intention to visit

4.3. Serial Mediation

The results listed in Table 6 confirm the serial mediation of perceived usefulness and adoption in an indirect effect of credibility on intention to visit (β=0.023; *p<0.01*). In addition, the product of coefficients found evidence for serial mediation of perceived usefulness and adoption in an indirect effect of quality on intention to visit (β=0.056; *p<0.001*). Further, the study found evidence for serial mediation of perceived usefulness and adoption in an indirect effect of vivacity on intention to visit (β = 0.021, *p<0.01*). Thus, the results in Table 6 indicate that perceived usefulness and adoption were two mediators in serial form between the relationship of three characteristics of the eWOM and intention to visit in support of H3.

Table 6: **Serial mediation results**

	Path relation	Path coefficient	CIs Bias corrected	Supported
H3a	**CRED-> PU -> AD -> INT**	0.023**	[0.012, 0.038]	Yes
H3b	**QUA-> PU -> AD -> INT**	0.056***	[0.035, 0.081]	Yes
H3c	**VIV -> PU -> AD -> INT**	0.021**	[0.010, 0.036]	Yes

Note: **p<0.01; ***p<0.001
CRED: Credibility; **QUA**: Quality; **VIV**: Vivacity; **PU**: Perceived Usefulness; **AD**: Adoption; **INT**: Intention to visit

4.4. Multigroup Analysis

To test the gender (H4) moderation hypothesis, we performed a Multigroup analysis (MGA), which initially requires establishing measurement invariance. We tested measurement invariance using the three-step MICOM approach (Henseler et al., 2016b), which involves configural invariance assessment and compositional invariance assessment, and the assessment of equal means and variances for the groups (Rasoolimanesh et al., 2021). Appendix C shows the MICOM results, establishing full measurement invariance between the two groups (men and women). We performed an MGA according to Henseler's nonparametric procedure, which directly compares group-specific bootstrap estimates to validate a potential difference between these parameters (Henseler et al., 2016b; Rasoolimanesh et al., 2021).

The findings of the MGA (Table 7) indicate a significant moderating effect of gender in the indirect effect of perceived usefulness in the relation between quality and adoption (Δβ=0.135; *p<0.05*). The relation between quality and adoption (mediated by perceived usefulness) is weaker for men than women. Moreover, the results confirm the no significance of the results for differences between men and women in the mediating effect of perceived usefulness between credibility and adoption (Δβ=0.047; *p>0.05*) and between vivacity and adoption (Δβ=0.006; *p>0.05*). The results show a significant difference between the two groups (men and women) in the mediating role of adoption between perceived usefulness and intention to visit (Δβ=0.088; *p<0.05*). The effect of perceived usefulness on intention to visit (mediated by adoption) is stronger for women than for men. The results indicate no differences between men and women in the serial indirect effect (mediated by perceived usefulness and adoption) of credibility on intention to visit (Δβ=0.021; *p>0.05*) and vivacity on intention to visit (Δβ=0.006; *p>0.05*). Finally, the moderating effect of gender is significant in the serial mediation of perceived usefulness and adoption in an indirect effect of quality on intention to visit (Δβ=0.058; *p<0.05*)

Table 7: **Multigroup analysis results**

Path relation	Path coefficient		CIs		Path coefficient difference	p-value Henseler's bootstrap	Supported
	Male	Female	Male	Female			
CRED -> PU -> AD	0.048*	0.096***	[0.012, 0.097]	[0.054, 0.142]	0.047	0.105	No
QUA -> PU -> AD	0.106**	0.241***	[0.053, 0.170]	[0.175, 0.329]	0.135	0.010*	Yes
VIV -> PU -> AD	0.056**	0.062*	[0.022, 0.096]	[0.014, 0.111]	0.006	0.434	No
PU -> AD -> INT	0.094**	0.182***	[0.045, 0.155]	[0.123, 0.252]	0.088	0.046*	Yes
CRED -> PU -> AD -> INT	0.014	0.035**	[0.003, 0.034]	[0.018, 0.059]	0.021	0.087	No
QUA->PU ->AD-> INT	0.031*	0.089***	[0.013, 0.060]	[0.057, 0.132]	0.058	0.014*	Yes
VIV -> PU -> AD -> INT	0.016*	0.023*	[0.006, 0.033]	[0.005, 0.047]	0.006	0.345	No

Note 1: A p-value less than 0.05 or greater than 0.95 indicates a significant difference at the 5% level for the specific path coefficient between the two groups

Note 2: Note: *p>0.05; **p<0.01; ***p>0.001

Note 3: **CRED**: Credibility; **QUA**: Quality; **VIV**: Vivacity; **PU**: Perceived Usefulness; **AD**: Adoption; **INT**: Intention to visit

DISCUSSION AND CONCLUSION

Theoretical contributions

This research proposes several advances that respond to the three research objectives. First, we aimed to understand the influences of eWOM on the intentions and behavior of tourists. To do so, we focused on the IAM model and its adaptation to the eWOM by considering consumers' information behaviors and behavioral intentions. Although the IAM is a commonly used model, this research criticizes it because it focuses only on the characteristics of information, namely quality, credibility, and usefulness. Specifically, this research underscores the importance of taking consumers' attitudes toward eWOM information in the analysis of the effect of eWOM on social media networks. These results are also recently echoed in the work of Knoll (2016).

Second, this study allowed the conceptualization of a theoretical framework of eWOM focused on virtual communities by including three characteristics of eWOM: the credibility of eWOM messages, quality, and vivacity. We thus suggest that vivacity is a peripheral index in our model. This work, therefore, presents the very first contributions along these lines. We studied the perceived credibility of the eWOM rather than the source's credibility. In summary, these results are consistent with the results reported by Ayeh et al. (2013). The authors established the importance of examining constructs such as the credibility of UGC (User-Generated-Content) on social networks for travel planning and behavioral intentions, and the work of Ponte et al. (2015) who demonstrated the strong impact of credibility on the intention to buy online (Munawar et al., 2021).

Furthermore, the findings of the present research support the hypothesis that the perceived usefulness mediates the relations between the eWOM characteristics and eWOM message adoption, in line with Nechoud's (2019) findings. Moreover, the serial mediation of perceived usefulness and message adoption to the influence of the three eWOM characteristics on behavioral intention was emphasized in this research since the results of our study show that, in a tourism context, more information is perceived as credible, vivid and with high quality in virtual communities more likely the Internet user consider the message as useful to adopt. The more the Internet user adopts these messages, the more he/she develops a favorable intention toward a tourist destination. This result provides supporting evidence for the second objective of this research.

This work partially validates the third objective of this research, namely the analysis of the moderating role of gender. The results of the MGA reveal a difference between men and women in the mediating effect of adoption between perceived usefulness and intention to visit. These findings are contrary to previous studies (Chen et al., 2015, Karatsoli & Nathanail, 2020; Assaker, 2019).

The results discussed above enrich to the existing literature on the moderating effect of gender on the relations between antecedents of perceived usefulness and eWOM message adoption. In particular, in this paper, we confirmed that eWOM message quality is a key determinant of eWOM use and adoption for female travelers. The results highlight that the serial mediation effect of perceived usefulness and message adoption regarding the influence of eWOM message quality on intention to visit is stronger for women than for men. Similarly, the role of perceived usefulness as a mediator of the relation between eWOM message quality and message adoption is significantly stronger for women than for men.

The results show that women are more responsive to reading and adopting eWOM than men. Indeed, compared to men, and following the reading of online comments, women express in greater numbers their intention to visit the destination. This finding is in accordance with existent literature on the fact that women are more impressionable than men (Aronson, 2003) and more likely to conform (Sistrunk & McDavid, 1971).

However, these findings contradict the results of (Acheampong et al., 2018; Mandari & Chon, 2018; Munawar et al., 2021). These contradictory results could be explained by the type or nature of the messages used/studied. Moreover, the results confirm the no significance of the differences between men and women in the mediating effect of perceived usefulness between credibility and adoption and between vivacity and adoption. However, these results are consistent with other studies on hotel application usage and mobile shopping adoption (Kim, 2016; Tan & Ooi, 2018; Munawar et al., 2021).

Several authors in the field of tourism and travel agree that women are increasingly involved in online information searches and visit several travel sites before making a purchase decision (Han et al., 2017). For example, the study conducted in partnership with TripAdvisor by Gretzel & Yoo (2008) found that women were more likely than men to agree that traveler reviews can facilitate decision-making.

Practical implications

In virtual communities, tourism industry stakeholders can simulate effective eWOM on products or services that can influence behavioral intentions. Therefore, examining tourists' behavior in depth is essential to better understand their decision-making process. In this way, understanding how tourists perceive eWOM signals while looking for a destination is essential for maximizing the benefits of eWOM from a managerial perspective in the tourism industry.

The efficient strategy to increase eWOM message adoption is to study the factors influencing message credibility, message quality, vivacity, perceived usefulness, and message adoption. The current study allows actors in the tourism industry, especially in Algeria, to invest more effectively in social networks. For example, a customer testimonial video can incorporate positive customer feedback into the marketing plan. The finding of our study research show that eWOM has a significant direct and indirect influence (via perceived usefulness and adoption) on the intention to visit a destination. The problem of the impact of eWOM messages on these variables is even more important as a multitude of consumers reads them.

The determinants highlighted in this research are important from a managerial perspective. This enables marketers to understand the dynamics of eWOM in general but also eWOM on social networks and from different individual platforms (Assaker & O'connor, 2020), when implementing destination marketing campaigns. In Algeria, social networks (Facebook and Instagram, for example) have become the most effective marketing platforms for disseminating eWOM messages. Users of these networks have been actively sharing their experiences with other users in online groups (Facebook Groups). Marketers need to learn how to interact with these communities on social networks.

The findings of this research should persuade marketers to incorporate eWOM elements in their social network marketing campaigns. For example, the most important aspect of eWOM - the quality of arguments - could be implemented in several ways, such as strengthening the relationship with Internet users by sharing persuasive online reviews. Complete, pertinent, and accurate posted notices would impact how message recipients perceive the quality and credibility of messages. Additionally, marketers must ensure that they give appropriate social network groups credible, consistent, and up-to-date information.

The moderating effects of eWOM message adoption by gender are interesting findings. Practitioners should think differently about differences in eWOM message adoption among women than among men. Men are less impressionable than women. In addition, women are increasingly involved in online information retrieval and are interested in the content of messages shared in virtual communities before making an adoption decision. Marketers can seize the opportunity by taking advantage of an extensive and complete comprehension of eWOM.

Study limitations and future research

A number of limitations need to be noted regarding the present study. A first limitation concerns the number of eWOM characteristics mobilized in this study remains small and would require expansion. Thus, future studies can include more eWOM features such as customer ratings, overall product rankings, and autonomy for a better understanding of the persuasiveness of eWOM. Although the modeling undertaken in this research has shown the value of using gender as a moderating variable in our model, it would be relevant to further develop the proposed model by incorporating other socio-demographic variables (education level, income, age) as moderating variables. In particular, analyze how age (generation Y, Z) may have non-linear relationships with the information adoption decision and behavioral intentions.

A second potential limitation concerns that this research assessed the impact of eWOM on virtual communities on Facebook. The dynamics observed on all social networks suggest several avenues of research. It would be useful to investigate the communities of e-influencers on Instagram and Vloggers on YouTube. In terms of future research, extending the findings by examining specific services or products would be useful to offer more generalization in the results. In addition, it would be relevant to test this model in cross-cultural studies. Finally, personality and psychological traits should be studied for their effects on consumer behavior.

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Appendix A: Measurement items

Variable	Source	Items Nbr	Items	Scales
eWOM messages quality	Erkan & Evans (2016)	5	…has a sufficient reason supporting the opinions …is objective. …is understandable. …is clear. In general, the quality of … is high.	Likert
Perceived Credibility	Ayeh et al. (2013) Ponte et al. (2015)	5	...honest. ...trustworthy. ...reliable. ...sincere. ...dependable	Likert
Vivacity	Babin & Burns (1998) Gavard-Perret & Helme-Guizon (2003) Yim et al. (2017)	6	Clear Detailed Vivid Intense Lifelike Well-defined	Likert
Perceived Usefulness	Bhattacherjee (2001) Wu & Chen (2005) Casaló et al. (2011)	3	…Helps me to solve doubts when I plan to travel. …Helps me to organize travels more efficiently. In general, … is useful to plan travels	Likert
eWOM message adoption	Wu & Shaffer (1987) Susman et al. (2003) Hung & Kuo (2014)	3	How closely have you followed these posts in these groups? selectively/to the letter To what extent do these posts' content motivate you to visit the destination? Not motivated/very motivated How much do you agree with the content in these testimonials (previous experiences)? Completely disagree / Completely agree	Semantic difference
Intention to visit	Lam & Hsu (2006)	3	Likelihood to visit …. in next 12 months Intend to visit …. in next 12 months Want to visit ….	Likert

Appendix B: Discriminant Validity. HTMT criterion

	HTMT ratio	CIs (bias-corrected)
QUA-> CRED	0.317	[0.214, 0.415]
VIV -> CRED	0.324	[0.229, 0.409]
PU -> CRED	0.379	[0.292, 0.458]
AD -> CRED	0.273	[0.187, 0.364]
INT -> CRED	0.314	[0.222, 0.405]
VIV -> QUA	0.513	[0.420, 0.596]
PU -> QUA	0.583	[0.502, 0.652]
AD -> QUA	0.503	[0.409, 0.588]
QUA -> INT	0.381	[0.287, 0.468]
VIV -> PU	0.433	[0.340, 0.514]
VIV -> AD	0.270	[0.167, 0.369]
VIV -> INT	0.457	[0.362, 0.547]
PU -> AD	0.497	[0.406, 0.584]
PU -> INT	0.470	[0.382, 0.548]
INT -> AD	0.415	[0.321, 0.502]

Appendix C: **MICOM results for the two gender groups**

Variables	Configural invariance	Compositional invariance (correlation = 1)		Equal mean value			Equal Variance			Full measurement invariance established
		C=1	CIs	Difference	CIs	Equal	Difference	CIs	Equal	
CRED	Yes	0.996	[0.988, 1.000]	0.024	[-0.166, 0.170]	Yes	-0.115	[-0.287, 0.269]	Yes	Yes
QUA	Yes	1.000	[0.999, 1.000]	0.038	[-0.166, 0.165]	Yes	-0.242	[-0.278, 0.277]	Yes	Yes
VIV	Yes	0.999	[0.995, 1.000]	0.068	[-0.167, 0.168]	Yes	-0.302	[-0.339, 0.343]	Yes	Yes
PU	Yes	1.000	[1.000, 1.000]	0.078	[-0.166, 1.71]	Yes	-0.204	[-0.284, 0.289]	Yes	Yes
AD	Yes	0.999	[0.991, 1.000]	-0.122	[-0.171, 0.73]	Yes	0.109	[-0.269, 0.271]	Yes	Yes
INT	Yes	0.998	[0.993, 1.000]	0.024	[-0.163, 0.163]	Yes	-0.113	[-0.272, 0.263]	Yes	Yes

Note: CIs: Confidence Interval
Note: **CRED**: Credibility; **QUA**: Quality; **VIV**: Vivacity; **PU**: Perceived Usefulness; **AD**: Adoption; **INT**: Intention to visit