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An Effective Model of Viral Marketing for e-Commerce Enterprises: An Empirical Study

Radwan Moh'd Al-Dwairi ^{1*}, Ali Alawneh ²

¹ Department of Information Technology, Yarmouk University, Irbid, Jordan.

² Management Information Systems Department, Faculty of Information Technology, Philadelphia University, Amman 19392, Jordan.

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Abstract

Despite the widespread significance of digital marketing in disseminating information about products and services across a vast customer base via diverse networks, a noteworthy proportion of businesses still struggle to comprehend the crucial factors underpinning the success of viral campaigns. This study aims not only to bridge this knowledge gap but also to introduce an innovative framework that underscores various factors that amplify the potency of social networks and emphasizes an often-overlooked element in customer engagement: the psychological state of customers. Empirical validation of the framework was conducted using a sample of 135 respondents, which was analyzed using the structured equation modeling technique. The study's findings show that the strength of social connections (strong ties) and the psychological disposition of customers significantly shape the generation and viral dissemination of marketing content across diverse networks. The importance of this research lies in its potential application by commercial companies for conducting promotional and marketing campaigns. By leveraging the proposed model, businesses can effectively promote their products and services, thus achieving their strategic objectives and gaining a competitive advantage in an environment characterized by intense competition and constant change.

Keywords: Viral Marketing; Social Networks; Strong Ties; Social Support; Psychological State; Customers' Similarities; Word-of-Mouth.

1. Introduction

In physical marketplaces, businesses use several forms of communication tools to influence consumers' buying processes. Traditional marketing tools such as radio, TV, in-store promotion, and print advertising can increase awareness of goods; hence, this can help in implementing different types of marketing strategies. During the Internet and social media age, e-commerce and social commerce are flourishing, and consequently, the entire buying process for customers as well as marketing strategies and techniques have dramatically changed. In addition, the influencers of social media start to play a vital role in customers' buying decisions as well as their attitudes towards business brands.

The Internet is considered the "fifth channel," following the traditional channels for implementing e-commerce practices and marketing tools [1]. However, the usage of the Internet in this domain does not stop the use of traditional marketing methods to encourage potential customers to enter the online buying process. In addition, the business market changed dramatically in communication strategies for implementing marketing campaigns. Hence, a new theme like viral marketing has started to be deployed using word-of-mouth in different types of networks [2]. For example, it is

* Corresponding author: r.aldwairi@yu.edu.jo

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easier than ever to communicate a message to many people and share information among them with exponential speed [1]. Social media marketing is understood as a group of Internet-based applications that build on the Web, which allow the exchange and creation of user-generated content and allow businesses to buy, sell, and reach their customers effectively [3]. This can help e-commerce enterprises get useful feedback for improvements in their business models and running processes. So that the one-to-one model of interaction or the podcasting model is replaced with a two-way communication model. In addition, customers can interact easily with their friends and share, like hash tags, etc., a particular message or ad that opens the door for utilizing a new type of marketing, which is called viral marketing.

Social media is an effective medium suited for viral marketing that is convenient to transmit the marketing message to a large group of people. The effect of users on other users is nine times more effective and powerful than advertising in a newspaper, magazine, or TV channel [1]. Turban et al. [4] mentioned that the unhappy consumer could share her feelings with 10 friends in a traditional environment; however, her behaviour can reach hundreds in the era of social networks. In addition, the authors mentioned that a musician initiated a social media firestorm against an airline company that refused to pay for damaging his guitar in an airport by producing three YouTube videos that spread virally and consequently gained more than ten million views. The difference between viral marketing and other types of marketing is that viral marketing has content that provokes people, whereas creative content, due to its authenticity on electronic social networks, can reach a large number of audiences by virally spreading from one individual to another on social networks [5]. Because of that, successful viral campaigns easily spread in such networks in an inexpensive way, which has a wonderful impact on customers purchasing behavior [6]. Consequently, viral marketing is an effective marketing technique where electronic communications about a particular brand or service are triggered throughout a wide network of buyers [7]. Besides, viral marketing is a marketing mechanism in which it uses the services of social networking platforms and other techniques to maximize brand awareness or gain more marketing goals by self-repeating the process of viral marketing, like the propagation of viruses among computer systems on a network. To get benefits from utilizing viral marketing, three parameters should be considered and checked carefully: the right message (content), the right messenger or receiver, and the right environment [5]. The role of the receiver (customer) is very crucial in this domain since her negative experience with a particular company or brand formulates a significant risk, which should be avoided [8]. Consequently, how to maximize the sales of a business company by using different advertising tools and selecting positive users for advertisements is a critical problem and considered a challenge for marketers [9].

Within the existing literature, there are multiple studies that delve into user patterns to facilitate the deployment of impactful marketing campaigns. However, it is important to highlight that only a limited subset of these studies squarely focus on the domain of viral marketing [10]. Moreover, while certain scholars have ventured into empirical research to understand the influence of viral marketing on customer attitudes, a mere handful have presented frameworks designed to steer marketers toward executing effective campaigns [2], and unfortunately, some of these studies remain scarce [7]. What is particularly significant, and often overlooked, is a factor entwined with the distribution of content and marketing advertisements across diverse networks: the customer's psychological state. Consequently, this study strives to do more than bridge this gap; it seeks to introduce an innovative framework tailored to the needs of business enterprises. This framework has been subjected to empirical testing, accumulating a wealth of information and insights that can inform business decision-making and elevate the execution of successful viral marketing campaigns. Additionally, the study seeks to answer the following major research question:

RQ. *What are the major factors, which are related to the tools of social media and customers' behaviour, that effectively contribute to implementing viral marketing campaigns?*

This article is structured as follows: Section 2 offers an overview of related work and the formulation of hypotheses. Section 3 details the research methodology, and Section 4 presents the data analysis and results. The discussion is presented in Section 5, while Section 6 encompasses the research conclusions and implications. Following that, Section 7 presents research declarations, and the article concludes with a references section.

2. The Related Work and Hypotheses Development

Viral marketing is a popular and effective strategy for promoting products or services among users to spread a message on social networks and create viral content through word-of-mouth. The success of viral marketing campaigns depends on a variety of factors. On the other side, social media is a term used for online tools and web sites that offer a chance for different types of interactions among individuals through new ideas, feelings, information, opinions, interests, etc. [1]. Social media represents a group of Internet-based tools and applications that build what is known as Web 2.0 and that allow the creation and exchange of user-generated content [11].

Reviewing the literature in this domain revealed that some scholars pointed to the effectiveness of influencers and communication and interactivity among individuals to create a type of social support, which in turn affects individual attitudes and word-of-mouth towards a product or a service. For example, Hmoud et al. [12] conducted a study to examine the role of online social media influencers on customers' intentions to buy a product. Their study revealed that trustworthiness, information quality, attractiveness, and expertise had a vital and significant role in customers'

purchasing processes. Tu et al. [4] studied individuals' opinion formation and information flows in online social networks. They present a new model that can quantify users' opinion changes as they are subjected to viral content. Their experimental results showed that the effects of marketing campaigns on users are different from polarizing contents, where the latter have a stronger effect. Ebrahimi et al. [13] studied how social networking sites affect customers' purchase behaviour. The result of their study demonstrated that interactions, word-of-mouth, and trends had significantly affected customer purchasing behaviour.

The concept of viral marketing implies that peer-to-peer (consumer-to-consumer) communications are an effective means to transform different types of digital messages using different types of internet-based tools to capture recipients' attention, trigger interest, and finally lead to the consumer's final decision. In this arena, email seems to continue to play an informational and powerful role in recipients' behaviour. The spread of spam or unsolicited bulk e-mails, viruses, and other types of malicious software has made recipients doubtful and has caused a high level of noise in most unsolicited e-mails. Consequently, similarities, strong ties, and social support [14] have a vital role in persuading recipients to accept the sent invitation. Zahid et al. [15] found that customers' social support led to more engagement and content sharing. Duffett [16] conducted research to examine the effect of interactive social media marketing communications on teenagers' cognitive, affective, and behavioural attitude factors. The study assured that social media marketing communications had a positive effect on each attitude component among users. In addition, results also showed that teenagers who used social media for a long time and updated their profiles continuously displayed the most responses to social media marketing communications. The study also considers the impact of several additional factors such as usage (access, length of usage, log-on frequency, log-on duration, and profile update incidence) and demographic (gender, age, and population group) variables on young consumers' attitudes toward social media marketing communications.

Huynh et al. [6] develop a cognitive-affective-behaviour model of viral marketing to examine the factors that affect viral advertising using factors like tie strength, perceptual affinity, and emotions. Their study proves the significant effect of the factors used in viral advertising. Interactivity among peers via social networking sites and their ability to participate in content generation and transmit their experiences, opinions, and feedback to their peers help in making a positive interface and offer a type of social support to their peers [17]. This social environment encourages peers to share their shopping familiarities and product information with their friends. Liang & Turban [18] pointed out that if a recipient receives a type of support from a peer on a social platform, then the recipient may perform the same action. This will boost the role of social support in affecting consumers' intentions to shop online and transmitting viral marketing messages among peers in online environments [17]. Furthermore, the study by Tobon & García-Madariaga [19] mentioned that individuals are connected in social networks where public leaders recommendations and comments have a significant impact on their decision-making behaviours. In addition, Wang & Huang [20] mentioned that digital influencers social power can influence individuals content participation and creation.

Based on this information, we suggest the following hypothesis:

H1o: *Social support and strong ties among customers have not had a significant positive impact on forwarding ads to others.*

H1: *Social support and strong ties among customers have a significant positive impact on forwarding ads to others.*

Currently, social networks have become an effective marketing tool to create viral marketing. However, the accomplishment of marketing campaigns mainly depends on individuals' participation in this process. Therefore, trust, desire, and willingness among peers are important factors that play a crucial role in encouraging individuals to participate in spreading marketing ads in a network. Trust is a transitive concept. For example, if A trusts B and B trusts C, then A trusts C, which assists the concept of trust transitivity [21] and its propagation in social networks [22, 23]. In the literature of psychology, people with feelings of preference give a big role to personal values before taking a decision. In contrast, people with intuitional preferences may trust others without any previous interaction [19]. Hence, trust and willingness are formulating a type of psychological state for the recipient, and they are proposed to have a significant effect on users' behaviour. Furthermore, Yadav & Rai [24] pointed out that customer satisfaction resulted in a psychological attribute, which entails a type of interpretation of its effect on the customer's decision process. In addition, it is important to understand the psychological mechanisms that affected individuals' behaviour in sharing fake contents about some brands using social networks [25]. Additionally, Gvili & Levy [26] showed customer engagement in sharing WOM content because of trust. Balamoorthy & Chandra [27] showed that people with high psychological impact have a robust incentive to engage in customer engagement to participate in e-WOM statements.

Based on this information, we suggest the following hypothesis:

H2o: *Customers' positive psychological state has not a significant impact on forwarding marketing ads to others.*

H2: *Customers' positive psychological state has a significant impact on forwarding marketing ads to others.*

Viral advertising is an individual effort where the ads usually come from a source to a receiver. That means the companies do not give any kind of payment for ads Spreading [11]. Viral marketing takes several styles to propagate the ads: videos, interactive games, eBooks, some photos and images, text, email messages, and webpages. The main goal of marketers is to create exceptional viral marketing programs by sending viral messages to individuals who have high social networking skills and who can display, propagate, and advertise the messages to their friends and relatives. For this reason, the similarities and benefits between the beers also have a significant effect. For example, the strong ties and common attributes between peers also build strong relationships in the network and offer a high level of social support. Consequently, if the receiver thinks that there is a good benefit from the received ads, she may pass them on or forward them to her friends. This is especially true if the ads have a good attraction, create a strong emotion, drive users' attention, or WOW the recipient [6].

In social networks, there is a need to identify users' communities based on their social connections and needs. In addition, the spread of a new idea can be maximized if there is a possibility to identify a group of peers who share the same opinions and are interested in the same topic, taking into consideration social support and strong ties and their effects on peers' behaviours and attitudes. Hence, Moscato & Speril [28] conducted a survey that presents an overall study of different community detection techniques proposed for social networks, considering the related complex features. Based on this information, we suggest the following hypotheses:

H3o: Customers' similarities have not had a significant positive impact on forwarding ads to others.

H3: Customers' similarities have a significant positive impact on forwarding ads to others.

H4o: Customers' benefits have not had a significant positive impact on forwarding ads to others.

H4: Customers' benefits have a significant positive impact on forwarding ads to others.

Word-of-mouth and viral marketing are two related concepts that have a significant role in promoting products and services for business enterprises. Many scholars in the marketing literature discussed the concept of word-of-mouth and showed that it has an important role in generating viral marketing (for example, [1, 2, 5, 7, 13, 29, 30]). Many scholars link between the effect of WOM and customers purchase intention [31–35]. Aljarah et al. (2022) [36] distinguished between user-generated content and firm-generated content and showed that user engagement by generating online content about brands has more effect than firm-generated content. Puriwat & Tripopsakul [2] examined the effect of viral marketing strategies on brand recognition and brand preference by suggesting a framework for the effectiveness of viral marketing in social media contexts. Their results showed that effective viral marketing points positively to brand recognition and preference. Domingos [7] suggested a social network model to design viral marketing plans that maximize positive word-of-mouth among customers. His experiments achieved much higher profits than ignoring interactions among customers and the equivalent network effects, as a traditional marketing technique does. Petrescu & Korgaonkar [29] clarify the concepts of WOM, eWOM, and viral marketing, aiming to reduce the ambiguities between those concepts. WoM is more effective than traditional print advertising in affecting consumers' buying processes [37].

Alsuwaidan et al. [10] propose a novel spreading framework for viral marketing. Their work ensures optimization in terms of cost and time by focusing only on the most energetic users on online social networks. Their framework divided the overall community into clusters, each of which had its own interests. In addition, it ensures overlapping between clusters when users have more than one interest.

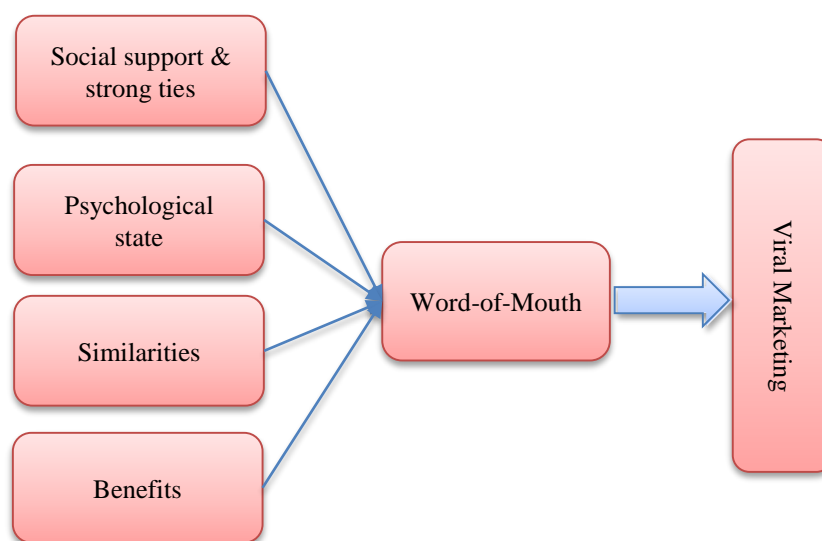


Figure 1. The research model

Kaplan & Haenlein [38] defined viral marketing as electronic word-of-mouth where a message is spread in an exponentially growing way via social media networks and considered three conditions to be fulfilled to attain the set goals and objectives. These three conditions are the message, the right person, and the environment. They recommended some caution that managers should consider when trying to launch their viral marketing campaigns. Figure 1 shows the research framework.

3. Research Methodology

To achieve the objectives of the study and to test the proposed model, a questionnaire was prepared based on multiple ideas from previous studies in the same field. The questionnaire consists of two main parts. The first part contains questions related to the demographic factors of the participants in the study, while the second part contains questions based on a Likert scale ranging from 1 being “strongly disagree” to 5 being “strongly agree” related to measuring the constructs of the proposed model.

The questionnaire was prepared in English to be in line with exactly the ideas and terminology used in the field of study. The opinion of three lecturers in the Department of Information Technology at Yarmouk University was taken regarding the quality of the questions included, clarity, and ability to measure the studied phenomenon. Based on their feedback, the required amendments were made to the questionnaire to improve its quality. After that, the questionnaire was distributed to three students in the master's level and eleven students in the bachelor's stage, where they were requested to answer the questionnaire and give their comments and observations about the questions used in the study. All comments were considered, and the questionnaire was modified accordingly. After that, the questionnaire was translated into Arabic so that it would be appropriate to answer it from different segments of participants who do not know the English language well. Finally, the questionnaire was prepared using Microsoft Forms, and its link was distributed to social networking sites, forums, and online groups to give different types of respondents a good opportunity to answer it. Moreover, participation in this study is voluntary, without any financial incentives. Consequently, the sample of the study consists of 135 employees who filled out the questionnaire. Table 1 shows the respondents' profiles.

Table 1. The respondents profile

Category	Type	Frequency	Percent	Total (N)
Gender	Male	85	63	135
	Female	50	37	
Age	From 18-25	53	39.3	
	From 25-36	19	14.1	
	From 36-45	40	29.6	
	>=46	23	17	
Educational level	Bachelor	66	48.9	
	Master	37	27.4	
	PhD	22	16.3	
	Others	10	7.4	

4. Data Analysis and Research Results

Data analysis for the collected data was done using IBM SPSS Statistics version 20.0. For the purposes of proceeding to analyse the gathered data, it's required to test the requirements of linear regression, namely linearity, normality, multicollinearity, and outliers.

4.1. Linearity

Figure 2 illustrates a scatter plot displaying a clear linear pattern, with points evenly and randomly distributed across the chart. This observation supports the assumption of linearity being met [39].

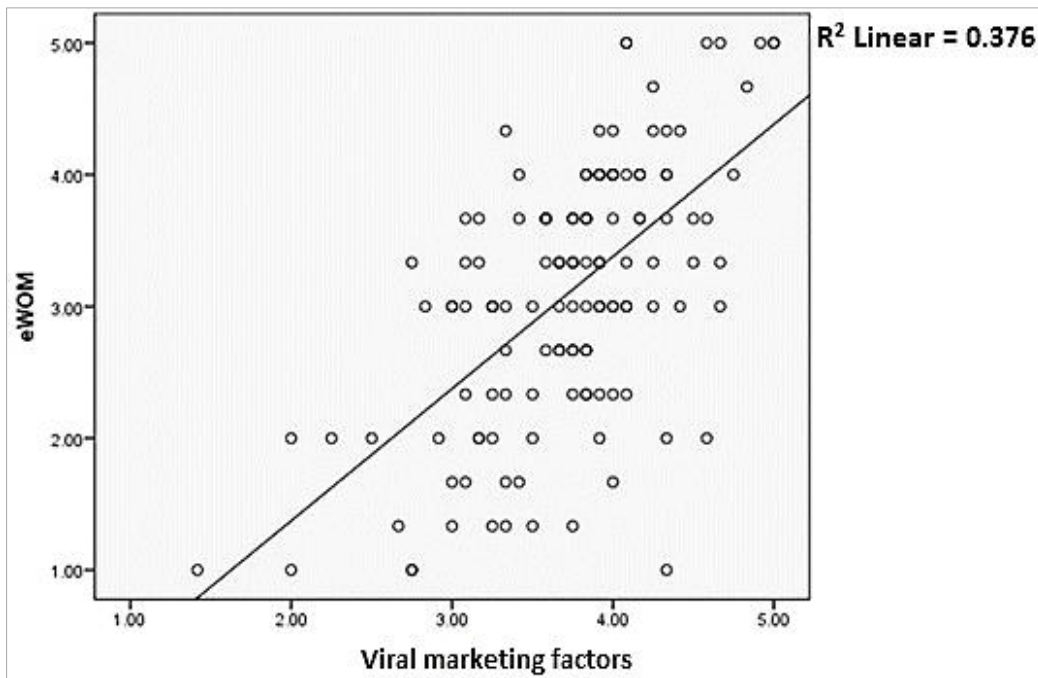


Figure 2. Scatter plot for factors of viral marketing vs. eWOM

4.2. Normality

Figure 3 demonstrates that the residual data are well distributed throughout the chart, exhibiting no significant skewness. This indicates that the assumption of linearity is satisfied [39].

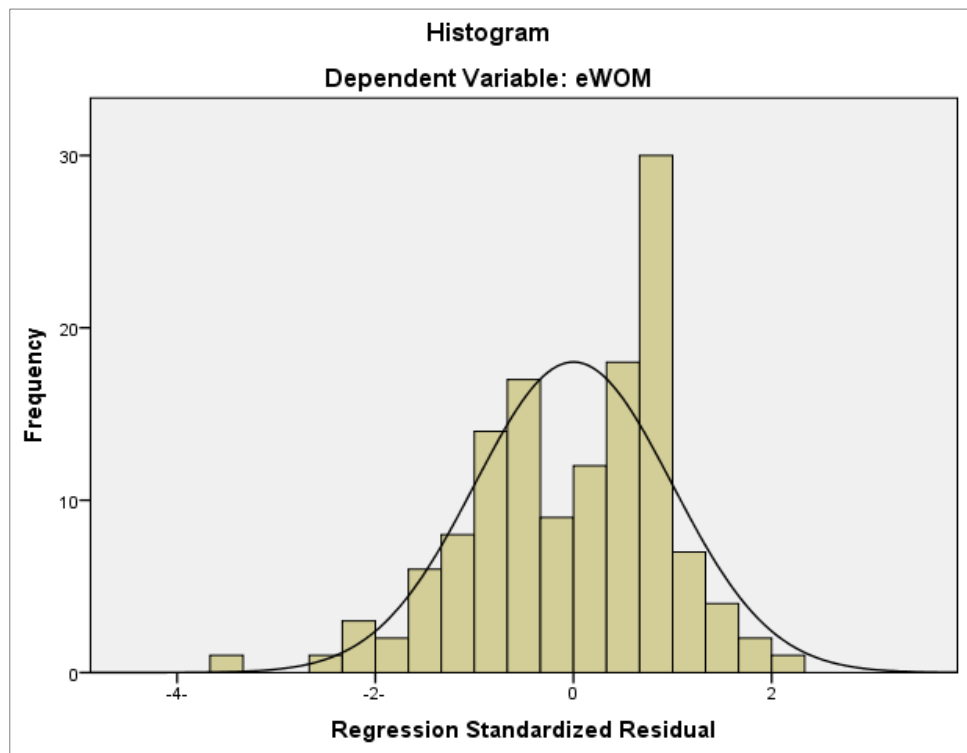


Figure 3. Histogram: Factors of Viral Marketing vs. eWOM

4.3. Multicollinearity

In Table 2, the Variance Inflation Factor (VIF) values are observed to be within an acceptable range, all less than or equal to 4, indicating the absence of serious multicollinearity [39]. Additionally, the tolerance values for all predictors are greater than 0.10, indicating that it is feasible to identify the predictors contributing significantly to predicting the dependent variable.

Table 2. Collinearity Statistics

Model	Unstandardized Coefficients		Standardized Coefficients	Collinearity Statistics	
	<i>B</i>	<i>Std. Error</i>	<i>Beta</i>	<i>Tolerance</i>	<i>VIF</i>
(Constant)	-0.472	0.435			
1 social_support	0.286	0.104	0.237	0.638	1.568
psychological_state	0.436	0.145	0.329	0.394	2.540
Similarities	0.078	0.141	0.052	0.523	1.913
Benefits	0.163	0.104	0.132	0.669	1.494

4.4. Outlier Analysis

In Table 3, the calculated value of Durbin-Watson is 2.150, indicating no violation of the independence assumption for the residuals data. The proximity of the Durbin-Watson value to 2 suggests that the regression model adequacy is achieved, as there is no evidence of outliers or influential points affecting the regression analysis [39].

Table 3. Outlier Statistics

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.625 ^a	0.390	0.371	0.79690	2.150

a. Predictors: (Constant), benefits, social_support, similarities, psychological_state

Dependent Variable: eWOM

5. Discussion

Multiple linear regression (MLR) is a statistical approach used to explain the causal relationship between two or more independent explanatory variables and a dependent predictor variable [17]. In addition, it is a multivariate statistical technique used to examine the relationship between an outcome variable and several predictors. Furthermore, MLR is used to predict the relative contribution of social support, psychological state, similarities, and benefits to the outcome variable eWOM. Hair et al. [39] state that MLR provides a means of objectively assessing the magnitude and direction of each predictor’s relationship to its outcome variable. The forced entry regression method is used, and the ‘stepwise’ regression is more appropriate in the exploratory phase of research or for the purposes of predicting the change in dependent variable attributed by independents [40]. Therefore, the change in the R² and the F statistic is examined in each step.

The unstandardized coefficient B (constant) represents the average value of the dependent variable when all the independent variables are set to zero. In this study, as seen in Table 4, when social support, psychological state, similarities, and benefits are all equal to zero, the average value of eWOM is -0.472. The unstandardized coefficient B (social support) indicates the average change in electronic word-of-mouth (eWOM) associated with a one-unit increase in social support while holding the other independent variables constant. Table 4 shows that each additional unit of social support is associated with a 0.286 increase in eWOM. The significance level (Sig.) for social support is represented by the p-value, which in this case is 0.007. Since this value is lower than the predetermined significance level of 0.05, we can conclude that social support has a statistically significant association with eWOM.

Table 4. Regression coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	<i>B</i>	<i>Std. Error</i>	<i>Beta</i>		
(Constant)	-0.472	0.435		-1.084	0.280
1 social_support	0.286	0.104	0.237	2.759	0.007
psychological_state	0.436	0.145	0.329	3.011	0.003
similarities	0.078	0.141	0.052	0.552	0.582
benefits	0.163	0.104	0.132	1.574	0.118

Similarly, for psychological state, the calculated t-value is 2.759, and the associated significance level from the test is 0.007, which is lower than the chosen significance level of 0.05. Thus, we reject the null hypothesis and accept that B1 is significantly different from zero. Consequently, we approve hypothesis H1.

This result highlights the significant role of social support and strong ties among customers (peers) in disseminating marketing ads and promotions on social networks. As such, this study shows that customers will share a marketing ad if their friends have positive feedback about it. In addition, if customers get encouragement from their peers to share an ad, they will positively respond to such a recommendation. This result also recommends that people are the main part of social networks and rely heavily on online communications and interactivity to get the required information and experiences from their peers to formulate their purchasing decisions and generate positive WOM for others by forwarding the marketing ads to their other peers. Hence, through engagement, sharing, and confirmation, customers become loyal and brand advocates on social networks. This result is consistent with [15, 23, 40, 41]. Social support usually comes in the form of positive comments: WOM from peers in social networks that encourage customers to mimic the same decisions of their peers.

Puriwat & Tripopsakul [2], who mentioned that viral marketing is a type of WOM communication among individuals, assist in this result. Hence, WOM marketing is a way of communicating and transferring business promotions and messages among customers from person to person. In addition, word-of-mouth marketing covers the efforts of businesses to lead customers to create marketing-related content and communicate this information to other consumers using new communication channels like smart phones, email, SMS messages, blogs, and business Web sites [1]. Akyol [1] pointed out that WOM is four times more effective than personal sales and seven times more effective than advertisements. He also presented the new form of WOM, which is done using the Internet as eWOM, and defined it as "All kinds of positive and negative feedback or comments that belong to customers referred to a product or a company through the Internet. eWOM covers customer comments on Internet mediums like social networking sites. Even though each social platform on the Internet has its own common features and capability to distribute information very fast to a very wide range of individuals globally. The unstandardized coefficient B (psychological state) indicates the average change in electronic word-of-mouth (eWOM) associated with a one-unit increase in psychological state while holding the remaining independent variables constant. In this case, each additional unit of psychological state is associated with a 0.436 increase in eWOM. The significance level (Sig.) for psychological state represents the p-value, which in this instance is 0.003. Since this value is lower than the predetermined significance level of 0.05, we can conclude that psychological state has a statistically significant association with eWOM.

Similarly, for psychological state, the calculated t-value is 3.011, and the associated significance level from the test is 0.003, which is lower than the chosen significance level of 0.05. Thus, we reject the null hypothesis and accept that B1 is significantly different from zero. Consequently, we approve hypothesis H2. This result assures that individuals are living in a new, risky online environment where trust and willingness are playing a vital role in shaping positive customer buying decisions as well as positive behaviour about the brand or the given service. Consequently, trust is an important component in recommending and sharing marketing content with others. Hence, such factors are important components for disseminating positive messages and contents virally on social networks. In addition, customers are able to participate in the spreading of the marketing ads when they are happy, excited, or in a good and positive mood. This result is consistent with the recommendations of [22, 42].

The unstandardized coefficient B (similarities) indicates the average change in electronic word-of-mouth (eWOM) associated with a one-unit increase in similarities while holding the remaining independent variables constant. In this case, each additional unit of similarity is associated with a 0.078 increase in eWOM. The significance level (Sig.) for similarities represents the p-value, which in this instance is 0.582. Since this value is not lower than the predetermined significance level of 0.05, we cannot conclude that similarities have a statistically significant association with eWOM. Additionally, the calculated t-value for similarities is 0.552, further supporting the lack of significance. Therefore, we accept the null hypothesis, indicating that B3 is equal to zero, and as a result, we reject hypothesis H3. Similarly, for benefits, the unstandardized coefficient B represents the average change in eWOM associated with a one-unit increase in benefits while holding the remaining independent variables constant. In this case, each additional unit of benefits is associated with a 0.163 increase in eWOM. The significance level (Sig.) for benefits is 0.118, which is not lower than the predetermined significance level of 0.05. Consequently, we cannot conclude that benefits have a statistically significant association with eWOM. This result indicates that the null hypothesis is accepted and B4 is equal to zero. Therefore, we reject hypothesis H4. These results of this study show that customers' similarities in opinions, genders, and perceived benefits are not necessary to participate in sharing marketing ads on social networks. As such, the study shows no significant effect on reposting a commercial ad if customers receive such promotions from a friend that has a similar interest.

R squared shows the proportion of the variance in the dependent variable that can be explained by the independent variables. Table 5 shows that 39% of the variation in eWOM can be explained by social support, psychological state, similarities, and benefits. On the other side, Std. Error of the Estimate represents the average distance that the observed values fall from the regression line. In this study, the observed values fall by an average of 0.79690 units from the regression line. The coefficient of determination R^2 indicating the percent of how much of the total variance is explained by the independent variables, is 39%.

The regression equation based on Unstandardized Coefficients is as follows:

$$\text{Estimated eWOM} = -0.472 + 0.286 \times (\text{social_support}) + 0.436 \times (\text{psychological_state}) + 0.078 \times (\text{similarities}) + 0.163 \times (\text{benefits})$$

Table 5. Model's Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.625 ^a	0.390	0.371	0.79690

a. Predictors: (Constant), benefits, social_support, similarities, psychological_state

Dependent Variable: eWOM

The F-statistic is calculated as the ratio of the regression mean square (MS) to the residual mean square. This statistic serves as a measure of whether the regression model offers a superior fit to the data compared to a model containing no independent variables. In essence, it evaluates the overall usefulness of the regression model. When the obtained p-value (P) is less than the chosen significance level, there is substantial evidence to conclude that the regression model provides a better fit to the data than the model with no predictor variables [39]. This result is favourable because it indicates that the predictor variables in the model significantly enhance the model's fit. Moreover, it is worth noting that if none of the predictor variables in the model are statistically significant, the overall F statistic is also not statistically significant. In Table 6, the overall F statistic for the regression model is calculated as the ratio of the Mean Square Regression (13.203) to the Mean Square Residual (0.635), resulting in a value of 20.791. This indicates that a significant portion of the total variance in the data is attributed to the regression equation. The calculated F value of 20.791 represents the variance generated by the regression, and this finding is promising as it suggests that the predictor variables in the model indeed contribute to improving the model's fit [39]. It's important to note that when none of the predictor variables in the model are statistically significant, the overall F statistic also becomes statistically insignificant. However, in this case, the obtained F value signifies a substantial impact of the predictor variables on the model's performance, further validating the model's appropriateness.

Table 6. Variation analysis

Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	52.813	4	13.203	20.791	0.000 ^b
	Residual	2.556	130	0.635		
	Total	135.370	134			

Dependent Variable: eWOM

b. Predictors: (Constant), benefits, social_support, similarities, psychological_state

Table 7 presents the Sig values, which represent the p-values associated with the overall F statistic. These values determine whether the regression model, as a whole, is statistically significant. In essence, these p-values indicate whether the four independent variables in this study have a statistically significant association with the dependent variable (eWOM). The study's results, as shown in Table 6, reveal that the p-value is calculated to be 0.000, indicating a statistically significant association between the independent variables (social support, psychological state, similarities, and benefits) and eWOM (the dependent variable). However, the analysis in Table 6 also reveals that two variables, namely, similarities and benefits, do not act as significant predictors for eWOM. Therefore, these variables are excluded from the regression model. Consequently, Table 7 displays the new regression model for this study, reflecting the removal of these non-significant predictors.

Table 7. Modified Regression Coefficient

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
	(Constant)	-0.110	0.368	-0.298	0.766	
1	social_support	0.308	0.104	0.254	2.970	0.004
	psychological_state	0.566	0.114	0.426	4.983	0.000

As a result, the updated coefficient of determination (R²) in Table 8 is recorded as 37.5. Moreover, the analysis in Table 9 reaffirms that the two significant predictors, namely, social support and psychological state, significantly influence the dependent variable eWOM.

Table 8. Modified Model's summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.613 ^a	0.375	0.366	0.80037

a. Predictors: (Constant), psychological_state, social_support

Dependent Variable: eWOM

Table 9. Modified variation analysis

Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	50.812	2	25.406	39.661	0.000 ^b
	Residual	84.557	132	0.641		
	Total	135.370	134			

6. Conclusions

Viral marketing has emerged as one of the most effective techniques for the widespread dissemination of marketing ads to a global audience. The rise of e-commerce and social media platforms has provided businesses with abundant opportunities to thrive and succeed. Among these opportunities, social platforms stand out as valuable channels that enable companies to advertise their products and services at a low cost while reaching millions of individuals worldwide. Viral marketing, as an internet-based tool, effectively engages third parties in the advertising process. Every business recognizes the significance of marketing, and the primary objective of viral marketing is to expand market reach and grow the customer base at the lowest possible cost. This objective can be achieved by generating powerful word-of-mouth (WOM) recommendations. The success of viral marketing campaigns hinges on achieving widespread dissemination with minimal or no cost to the marketer. Ultimately, the primary goals of viral marketing encompass economic objectives such as fostering customer loyalty and advocacy, which are vital for realizing the company's strategic goals.

This study emphasizes the essential role of tie strength, social support, and customers' positive psychological state as critical factors for successful viral marketing campaigns. By comprehending and harnessing these factors, businesses can optimize the impact and reach of their viral marketing efforts, ultimately achieving strategic goals and gaining a competitive advantage in the marketplace. However, it is important to acknowledge the limitations of this study. Firstly, the sample size is relatively small, which may limit the generalizability of the findings. To enhance the robustness of future research, larger sample sizes should be considered. Additionally, the proposed model could benefit from the inclusion of additional factors that are relevant to this study, leading to a more precise and accurate result. To overcome these limitations, future research may be conducted in diverse environments and cultures, allowing for the collection of more extensive data records. Expanding the study to encompass more relevant factors could provide new insights and yield novel findings. By addressing these shortcomings and conducting further research, we can deepen our understanding of viral marketing and its impact on business outcomes. This will enable companies to refine their strategies and capitalize on the full potential of viral marketing to achieve their goals.

6.1. Research Implications

The significance of this study lies in the proposal of a viral marketing model for business enterprises. The model outlines a set of factors that can be utilized to generate positive electronic content about a specific product or service. This content can then be disseminated across various networks, groups, and online platforms, effectively reaching a large number of users and resulting in what is commonly known as viral marketing. To validate the effectiveness of the proposed model, a practical test was conducted involving 135 users from diverse backgrounds, including different genders, ages, and academic levels. The study's findings underscored the importance of strong social connections and support among users in generating positive word-of-mouth and facilitating its viral spread to millions of people. In addition, the importance of this research lies in its potential application by commercial companies for conducting promotional and marketing campaigns. By leveraging the proposed model, businesses can effectively promote their products and services, thus achieving their strategic objectives and gaining a competitive advantage in an environment characterized by intense competition and constant change. Furthermore, from a theoretical perspective, this study contributes new insights and findings to the existing body of knowledge. These findings can serve as a foundation for further research and exploration, enabling researchers to build upon them and achieve even greater advancements in this field.

7. Declarations

7.1. Author Contributions

Conceptualization, R.A. and A.A.; methodology, R.A.; software, A.A.; validation, R.A. and A.A.; formal analysis, A.A.; investigation, A.A.; resources, R.A.; data curation, R.A.; writing—original draft preparation, R.A.; writing—review and editing, A.A.; visualization, A.A.; supervision, R.A.; project administration, R.A. and A.A.; funding acquisition, R.A. and A.A. All authors have read and agreed to the published version of the manuscript.

7.2. Data Availability Statement

The data presented in this study are available in the article.

7.3. Funding

The authors received financial support for the research and/or publication of this article from the Deanships of Scientific Research and Graduate Studies in Yarmouk University and Philadelphia University, Jordan.

7.4. Institutional Review Board Statement

Not applicable.

7.5. Informed Consent Statement

Not applicable.

7.6. Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

8. References

- [1] Akyol, Ş. (2013). Social Media and Marketing: Viral Marketing. *Academic Journal of Interdisciplinary Studies*, 2(8), 586–590. doi:10.5901/ajis.2013.v2n8p586.
- [2] Puriwat, W., & Tripopsakul, S. (2021). The role of viral marketing in social media on brand recognition and preference. *Emerging Science Journal*, 5(6), 855–867. doi:10.28991/esj-2021-01315.
- [3] Al-Dwairi, R. M. D., & Al-Khataybeh, M. (2023). Web 2.0 Tools and Service Quality: The Key to Effective Customer Relationships in E-Commerce Environments. 2023 International Conference on Information Technology: Cybersecurity Challenges for Sustainable Cities, ICIT 2023 - Proceeding, 827–831. doi:10.1109/ICIT58056.2023.10226159.
- [4] Tu, S., & Neumann, S. (2022). A Viral Marketing-Based Model for Opinion Dynamics in Online Social Networks. *WWW 2022 - Proceedings of the ACM Web Conference 2022*, 1570–1578. doi:10.1145/3485447.3512203.
- [5] Dwivedi, Y. K., Ismagilova, E., Hughes, D. L., Carlson, J., Filieri, R., Jacobson, J., Jain, V., Karjaluo, H., Kefi, H., Krishen, A. S., Kumar, V., Rahman, M. M., Raman, R., Rauschnabel, P. A., Rowley, J., Salo, J., Tran, G. A., & Wang, Y. (2021). Setting the future of digital and social media marketing research: Perspectives and research propositions. *International Journal of Information Management*, 59, 102168. doi:10.1016/j.ijinfomgt.2020.102168.
- [6] Huynh, K. (2016). Factors Affecting the Success of Viral Marketing an Affective – Cognitive- Behavioral Process. *Business and Management Research*, 5(1), 40–45. doi:10.5430/bmr.v5n1p40.
- [7] Domingos, P. (2005). Mining social networks for viral marketing. *IEEE Intelligent Systems*, 20(1), 80–82. doi:10.1016/j.jretconser.2007.02.005.
- [8] Liao, M., Qi, L., & Zhang, J. (2020). The dynamic evolution mechanism of heterogeneous OWOM-an improved viral marketing model. *Information (Switzerland)*, 11(3), 140. doi:10.3390/info11030140.
- [9] Shuai, H. H., Shen, C. Y., Hsu, H. C., Yang, D. N., Chou, C. K., Lin, J. H., & Chen, M. S. (2015). Revenue maximization for Telecommunications Company with social viral marketing. *Proceedings - IEEE International Conference on Big Data, IEEE Big Data 2015*, 1306–1310. doi:10.1109/BigData.2015.7363886.
- [10] Alsuwaidan, L., Ykhlef, M., & Alnuem, M. A. (2014). A novel spreading framework using incremental clustering for viral marketing. In *Proceedings of IEEE/ACS International Conference on Computer Systems and Applications, AICCSA*, 78–83. doi:10.1109/AICCSA.2014.7073182.
- [11] Mora, E., Vila-Lopez, N., & Küster-Boluda, I. (2021). Segmenting the audience of a cause-related marketing viral campaign. *International Journal of Information Management*, 59(1), 102296. doi:10.1016/j.ijinfomgt.2020.102296.
- [12] Hmoud, H., Nofal, M., Yaseen, H., Al-Masaeed, S., & Alfawwaz, B. M. (2022). The effects of social media attributes on customer purchase intention: The mediation role of brand attitude. *International Journal of Data and Network Science*, 6(4), 1543–1556. doi:10.5267/j.ijdns.2022.4.022.
- [13] Ebrahimi, P., Basirat, M., Yousefi, A., Nekmahmud, M., Gholampour, A., & Fekete-farkas, M. (2022). Social Networks Marketing and Consumer Purchase Behavior: The Combination of SEM and Unsupervised Machine Learning Approaches. *Big Data and Cognitive Computing*, 6(2), 35. doi:10.3390/bdcc6020035.

- [14] Al-Dwairi, R. (2017). Social commerce adoption among Jordanian youth: Empirical study. *International Journal of Business Information Systems*, 26(3), 277–296. doi:10.1504/IJBIS.2017.10007573.
- [15] Zahid, M. M., Ali, B., Samdani, H., & Kamal, N. (2021). Linking Social Media Engagement with Customer Relationships and Brand Loyalty: A Consumer-based Perspective. *VFAST Transactions on Education and Social Sciences*, 9(3), 90–99.
- [16] Duffett, R. G. (2017). Influence of social media marketing communications on young consumers' attitudes. *Young Consumers*, 18(1), 19–39. doi:10.1108/YC-07-2016-00622.
- [17] Alawneh, A. A., Ai-Taani, F., Ai-Azzam, A., & Al-Radaideh, R. (2013). A proposed measurement scale for e-banking services quality in Jordan. *International Conference on Computer Applications Technology, ICCAT 2013, Sousse, Tunisia*. doi:10.1109/ICCAT.2013.6521961.
- [18] Liang, T. P., Ho, Y. T., Li, Y. W., & Turban, E. (2011). What drives social commerce: The role of social support and relationship quality? *International Journal of Electronic Commerce*, 16(2), 69–90. doi:10.2753/JEC1086-4415160204.
- [19] Tobon, S., & García-Madariaga, J. (2021). The influence of opinion leaders' eWOM on online consumer decisions: A study on social influence. *Journal of Theoretical and Applied Electronic Commerce Research*, 16(4), 748–767. doi:10.3390/jtaer16040043.
- [20] Wang, P., & Huang, Q. (2023). Digital influencers, social power and consumer engagement in social commerce. *Internet Research*, 33(1), 178–207. doi:10.1108/INTR-08-2020-0467.
- [21] Heilman, R. M., & Kusev, P. (2020). Personal Values Associated with Prosocial Decisions. *Behavioral Sciences*, 10(4), 77. doi:10.3390/bs10040077.
- [22] Nasir, S. U., & Kim, T. H. (2020). Trust Computation in Online Social Networks Using Co-Citation and Transpose Trust Propagation. *IEEE Access*, 8, 41362–41371. doi:10.1109/ACCESS.2020.2975782.
- [23] Al-Dwairi, R. M., & Kamala, M. A. (2009). An integrated trust model for business-to-consumer (B2C) e-commerce: Integrating trust with the Technology Acceptance Model. *2009 International Conference on Cyber Worlds*, 351–356. doi:10.1109/CW.2009.34.
- [24] Yadav, M. K., & Rai, D. A. K. (2015). Exploring the Relational Impact of Service Quality on Customer Satisfaction. *Ushus - Journal of Business Management*, 14(4), 17–31. doi:10.12725/ujbm.33.2.
- [25] Obadā, D. R., & Dabija, D. C. (2022). "In Flow"! Why Do Users Share Fake News about Environmentally Friendly Brands on Social Media? *International Journal of Environmental Research and Public Health*, 19(8), 4861. doi:10.3390/ijerph19084861.
- [26] Gvili, Y., & Levy, S. (2023). I Share, Therefore I Trust: A moderated mediation model of the influence of eWOM engagement on social commerce. *Journal of Business Research*, 166. doi:10.1016/j.jbusres.2023.114131.
- [27] Balamoorthy, S., & Chandra, B. (2023). The influence of intrinsic and extrinsic motivational factors on e-WOM behaviour: The role of psychological impact during the time of COVID-19 crisis. *Heliyon*, 9(2), e13270. doi:10.1016/j.heliyon.2023.e13270.
- [28] Moscato, V., & Sperli, G. (2021). A survey about community detection over On-line Social and Heterogeneous Information Networks. *Knowledge-Based Systems*, 224, 107112. doi:10.1016/j.knosys.2021.107112.
- [29] Petrescu, M., & Korgaonkar, P. (2011). Viral advertising: Definitional review and synthesis. *Journal of Internet Commerce*, 10(3), 208–226. doi:10.1080/15332861.2011.596007.
- [30] Hendrayati, H., & Pamungkas, P. (2020). Viral Marketing and E-Word of Mouth Communication in Social Media Marketing. *3rd Global Conference on Business, Management, and Entrepreneurship*, 41–48. doi:10.2991/aebmr.k.200131.010.
- [31] Al Qaimari, R., Al Hassan, M., Al Dmour, H., & Aloqaily, A. (2021). The effect of the electronic word of mouth on purchase intention via the brand image as a mediating factor: an empirical study. *International Journal of Networking and Virtual Organisations*, 24(2), 182. doi:10.1504/ijnvo.2021.10037256.
- [32] Alfandi, A. M., & Marco, V. (2021). Electronic Word of Mouth Effects on Middle East Destination Overall Image and Behavioral Intention. In *New Governance and Management in Touristic Destinations*, IGI Global, 134–151. doi:10.4018/978-1-6684-3889-3.ch009.
- [33] Khan, S. (2023). Evaluating the Impact of eWOM Adoption on Consumer Purchasing Intentions. *International Journal of Social Sciences and Entrepreneurship (IJSSE)*, 3(1), 2790–7724.
- [34] Indrawati, Putri Yones, P. C., & Muthaiyah, S. (2023). eWOM via the TikTok application and its influence on the purchase intention of somethinc products. *Asia Pacific Management Review*, 28(2), 174–184. doi:10.1016/j.apmr.2022.07.007.
- [35] Mainardes, E. W., Portelada, P. H. M., & Damasceno, F. S. (2023). The Influence on Cosmetics Purchase Intention of Electronic Word of Mouth on Instagram. *Journal of Promotion Management*, 29(7), 961–991. doi:10.1080/10496491.2023.2167897.

- [36] Aljarah, A., Sawaftah, D., Ibrahim, B., & Lahuerta-Otero, E. (2022). The differential impact of user- and firm-generated content on online brand advocacy: customer engagement and brand familiarity matter. *European Journal of Innovation Management*. doi:10.1108/EJIM-05-2022-0259.
- [37] Tănase, G. C. (2016). The 6C Model of Social Media and Developing a Viral Marketing Campaign. *Romanian Distribution Committee Magazine, Romanian Distribution Committee*, 7(3), 20–25.
- [38] Kaplan, A. M., & Haenlein, M. (2011). Two hearts in three-quarter time: How to waltz the social media/viral marketing dance. *Business horizons*, 54(3), 253-263. doi:10.1016/j.bushor.2011.01.006.
- [39] Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (2006). *Multivariate data analysis with readings*. Pearson Prentice Hall, New York, United States.
- [40] Alawneh, A., & Hattab, E. (2010). E-business Value Creation Jordanian Banking Services Industry: An Empirical Analysis of Key Factors. *International Arab Conference on e- technology*. Arab Open University, October 15-10, 2010, Amman-Jordan.
- [41] Al-Dwairi, R., Harb, Y., & Shehabat, I. (2020). The role of social platforms in establishing brand awareness for B2C e-commerce: Empirical study. *International Journal of Business Information Systems*, 33(4), 488-504. doi:10.1504/IJBIS.2020.10027510.
- [42] Cai Shi, M., & Lucietto, A. M. (2022). The Preference of the Use of Intuition over Other Methods of Problem Solving by Undergraduate Students. *The European Educational Researcher*, 5(3), 253–275. doi:10.31757/euer.532.

Appendix I: Questionnaire

Part 1: Demographic data

Gender Male Female

Age From 18-22 From 23-30 From 31-45 > 45

Online Shopping Experience using social media

None 1-3 years above three years

Educational Level

Bachelor degree Master degree PhD Others

Part 2: Using social media to create a new model for viral marketing for e-commerce enterprises

Please select the appropriate choice of evaluation by ticking the number beside the statement you read. To help, numbers mean:

1= Strongly disagree 2= Disagree 3= Neutral 4= Agree 5= Strongly agree

Social support

#	Statement	1	2	3	4	5
1	I will share or like an ad if my friends or relatives have a positive feedback about it.					
2	I will share or like an ad if my friends encourage me to do so.					
3	I think the positive or negative comments from my friend or relatives will affect my decision to like or resend an ad in the social platform					

Psychological state

#	Statement	1	2	3	4	5
1	I am more likely to share an ad when I am in a positive mood					
2	I am more likely to share an ad when I am happy or exited					
3	I will not share an ad when I am in a bad psychological state					

Similarities

#	Statement	1	2	3	4	5
1	I will share an ad if it comes to me from a group of my favourite friends					
2	I will participate in re-sending an ad if it comes to me from a group of my relatives with whom I have a strong tie.					
3	I will participate in reposting a commercial ad to my friends if they have similar interests to me					

Benefits

#	Statement	1	2	3	4	5
1	I will share or like an ad with my friends who can benefit from it is worthwhile					
2	I will forward an advertising e-mail to my friends if I think they will get some incentives from it.					
3	I will like an ad if it is useful to my friends					

Word-of-Mouth

#	Statement	1	2	3	4	5
1	I will probably forward some of advertising emails to my friends					
2	I'm likely to be positive about some ads on social media					
3	I will share some ads on social media					