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Forwarding Content in Online Social Environments

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Abstract

Based on previous studies a theoretical model is formulated incorporating psychological motivations and subsequent individual behaviors as determinants of the frequency with which an individual forwards online content using electronic means. The model is tested and developed using data collected by questionnaire from a sample of 1,233 individuals. The results from the final model confirm or partially support theoretical relationships among variables that have been reported in previous studies and there are new findings of causal effects due to an individual's: age; need for individuation, altruism, and personal growth; and level of curiosity. Apart from the theoretical contribution of the findings practical conclusions are presented as to means of increasing an individual's forwarding online content behavior.

Keywords: Age, altruism, curiosity, individuation, need to belong, personal growth, push/pull content.

Introduction

The study of the spread of messages among networks of humans precedes the internet and in particular has produced mathematical models which enable: the estimation of physical characteristics of the communication network (e.g. the number of recipients of a message); the validation of outputs from sophisticated computer simulations of message passing; and with modifications these models are useful in the study of the spread of particular diseases among humans. The development of internet based online communities and social networks has motivated researchers from different fields of study to investigate online communication in relation to identity, privacy, social capital, youth culture, and education. As noted by Sombutpibool (2011) online communication systems are human-centered information systems used for developing human relationships and they are quite different from task-oriented information systems which provide users with information or automated processes in order to increase their work performance.

Because of the relationship with human factors an individual's intention to forward messages (content) in an online environment cannot be determined by system performance alone (Rau et al., 2008; Steinfield et al., 2008). Numerous reasons for individual's to forward online messages

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have been examined from the perspective of social capital and cognitive theories (Huang et al., 2008), human emotions (Phelps et al., 2004; Dobele et al., 2007; Li et al., 2009), financial factors/benefits (Goldsmith, 2002; Knowledge@Wharton, 2009), and psychological motivations/behaviors (Ho and Dempsey, 2009). Social capital theory examines forwarding content behavior in terms of personal relationships within the community based on trust, cooperation, and collective actions while social cognitive theory explains forwarding content behavior in a social network in terms of the individual's cognitive functions. Human emotions evoked by messages being passed in an online environment have been studied in order to identify the message content and emotional responses that are associated with messages that are most likely to be forwarded to others. The online environment is fast growing, innovative, and profitable with financial benefits for private sector organizations. Return on investment in the online marketplace is linked closely to increasing brand awareness and an effective method to raise return on investment is to use pioneer customers to spread information through their online social networks. These financial factors/benefits in conjunction with the emotional impact of the content of messages are among the key issues that have been examined in the study of viral marketing (Nutley, 2007; Dalsgaard, 2008). From the perspective of psychological motivations/behaviors four motivations have emerged as important influences on forwarding online content behavior. The first refers to two needs for inclusion (the need to belong or to be part of a group and the need to be different or have public individuation). The second motivation is the need for altruism or affection which includes an individual's ability to lead other people affiliated with intimacy, warmth, and emotional involvement. The third is the need for personal growth or taking control including experiencing new opportunities, roles, and relationships and the fourth motivation concerns curiosity which is an individual's desire to know and learn. These psychological motivations lead to behaviors such as spending time online and pulling/pushing online content. This perspective based on psychological motivations/behaviors is the one adopted in this study primarily because there have been few studies conducted based on this perspective and consequently the current findings require further validation (Ho and Dempsey, 2009) and in particular no studies of this type were found that were conducted in the context of Thailand even though the importance of social media are emphasized in the National ICT Policy Framework 2011-2020 (www.ict2020.in.th).

The purpose of the study is to determine the psychological motivations and subsequent behaviors that influence an individual to forward messages to others using electronic means in online environments. The messages may originate from the individual or from external sources from which the individual has received solicited (pulled) messages or unsolicited (pushed) messages. Regardless of the source of the message or the content of the message the concern is with the psychological motivations and behaviors that influence the individual to forward the message to others using online internet based electronic means (e.g. email, instant messaging, chat rooms, and blogs) which are not restricted to the use of any particular technology because these means and the supporting technologies are normally integrated within existing technologies such as smart phones and social network sites. The findings from the study are expected to be of theoretical interest in understanding an important aspect of online communication with practical importance for those responsible for online applications such as viral marketing, knowledge sharing, and the development of social networks and online communities.

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Following a description of the research design and methodology (section 2) a review of related literature (section 3) sets the basis for the theoretical model (section 4). The data collected by questionnaire is prepared and preliminary analyses are presented (section 5). The theoretical model is tested and developed to a final model which is fully analyzed (section 6). The findings are interpreted, compared to those from previous studies and practical implications are discussed (section 7) with overall conclusions presented in section 8.

Research Design and Methodology

A cross-sectional quantitative field study approach is used to collect data using a self administered questionnaire which incorporates existing measuring instruments in order to improve the validity and reliability of measures. The unit of analysis is an individual who uses online information services but there is no restriction on the services used and it is expected that users may use more than one online information service. Participants need to be at least 12 years of age in order to be able to provide valid responses to questions concerning their motivations and usage behaviors as determinants of forwarding online content behavior.

The questionnaire was prepared in the English and Thai languages and was reviewed by a focus group of five users of online information services. Suggested modifications related to language translation were included and the revised Thai version was then used in a pilot study with 10 suitable participants. No further modifications were necessary and the Thai language version was used in the full study. A notated English version is in Appendix A1.

With an unknown population size a non probability purposive sampling method was used with a minimum sample size of 350 which satisfies criteria for the statistical validity of structural equation modeling (SEM) and other statistical techniques used in the data analysis (Kline, 2005). Sampling was done mainly by contacting participants through access provided by two large organizations operating in Thailand which have strong interest in online information services while other participants were among the researcher's personal contacts. Questionnaires were available in both hard and soft copy forms with a cover letter introducing the purpose of the study, instructions for its completion and return, and a contact address. The administration of the questionnaire took three weeks and produced 1,603 responses.

Review of Related Literature

The review presents an overview of the nature of previous studies related to the purpose of the study. This is followed by the identification and discussion of important constructs and their relationships which form the basis for the theoretical model which is presented in the next section 4.

An Overview of Previous Studies

The overview includes important and recent studies selected from five areas of investigation (viral marketing, electronic word of mouth, buzz marketing, knowledge sharing, and social networks) where studies have been conducted which are related to forwarding online content. In accordance with the purpose of this study the selection of studies focused on those that used

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quantitative explanatory approaches and investigated psychological motivations and behaviors of individuals which affect their behavior in forwarding online content. The nature of the selected studies is summarized in Table 1 where studies have been classified according to the research approach adopted: qualitative studies with a focus on the description and development of concepts; and quantitative studies aimed at developing explanations through models and hypothesis testing. Both categories of studies informed the identification of the important constructs and relationships used to develop a theoretical model of determinants of forwarding online content behavior.

Table 1. Overview of previous studies

Focus of Study	Unit of Analysis	Data Collection Method	Reference
Research Approach: Qualitative, Descriptive Concept Development			
Emotional connection through viral messages	Individuals	Survey	Dobele et al. (2007)
How to win friends and influence people the social networking way	Individuals	Survey	Nutley (2007)
Evaluating viral marketing: isolating the key criteria	Individuals	Survey	Cruz and Fill (2008)
Facework on Facebook	Individuals	Case study	Dalsgaard (2008)
Networks of friends	Networks	Survey	Naone (2008)
Bloging	Blogs	Survey	Singh et al. (2008)
A culture based approach to understanding the diffusion of new products	Individuals	Survey	Yalcinkaya (2008)
A conceptual model of viral marketing	Individuals	Survey	Lam and Wu (2009)
Social media	Social media	Survey	Mangold and Faulds (2009)
Millennials a portrait of generation next	Individuals	Survey	Pew Research Center (2010)
Knowledge sharing: a review and directions for future research	Research studies	Literature review	Wang and Noe (2010)
Research Approach: Quantitative, Explanatory			
Motives to communicate on the internet	Individuals	Survey	Henning-Thurau et al. (2004)
Viral marketing examining motivations to pass along email	Individuals	Interview	Phelps et al. (2004)
Causes and effects of online word of mouth (mouse)	Undergraduate university students	Survey	Sun et al. (2006)
Word of mouth communication within online communities	Individuals	Survey	Norman and Russell (2006)
Electronic word of mouth and its effect in communities	Individuals	Case study	Dwyer (2007)
Emotions, satisfaction, and word of mouth communication	Individuals	Survey	Ladhari (2007)
Word of mouth communication in online communities	Individuals	Case study	Brown et al. (2007)
The impact of electronic word of mouth	Individuals	Survey	Cheung et al. (2008)
Email spreading behavior across gender	Undergraduate university students	Survey	Chiu et al. (2008)
Culture influences on responses to online store atmospheric cues	Undergraduate university students	Survey	Davis et al. (2008)
A multi-stage model of word of mouth influence through viral marketing	Undergraduate university students	Survey	De Bruyn and Lilien (2008)
Bloging acceptance, social influence, and knowledge sharing	Individuals	Survey	Hsu and Lin (2008)
Factors affecting pass-along email intentions	Email users	Survey	Huang et al. (2008)
Determinants of mobile based word of mouth	Individuals	Survey	Okazaki (2008)
An agent-based model of viral marketing	An experimental model	Experimentation	Wang (2008)
Motivations to forward online content	Undergraduate university students	Survey	Ho and Dempsey (2009)
Discovering influential nodes for viral marketing	Individuals	Survey	Li et al. (2009)
Factors that influence knowledge sharing behavior via weblogs	Individuals	Survey	Yu et al. (2010)

Important Constructs and Relationships

This section identifies variables derived from previous studies and their relationships that are included in the theoretical model for this study. The variables are organized into two groups concerned with psychological motivations and individual behaviors where the behaviors of individuals are determined by the extent to which the motivations affect them.

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Psychological Motivations

The first three variables in this group are The Need to Belong, The Need for Individuation, and Altruism. ***The Need to Belong*** is fundamental to the creation of societies and the maintenance of interpersonal relationships. An individual's desire to share information with others is affected by their desire to belong to and be accepted by a group (Phelps et al., 2004; Norman and Russell, 2006; Dwyer, 2007; De Bruyn and Lilien, 2008; Ho and Dempsey, 2009). ***The Need for Individuation*** refers to the need to be different or stand out in a community and individuals who have a high need for public individuation are usually involved in public affairs, express their opinions, and stand out in the crowd (Yalcinkaya, 2008). Word of mouth communication can enhance an individual's status in a group by attracting attention from other members and satisfying the need for individuation (Ho and Dempsey, 2009). ***Altruism*** is the need to demonstrate generosity toward others and it is positively correlated with the desire for close and personal relationship (Hsu and Lin, 2008; Ho and Dempsey, 2009). Individuals often express altruism by sharing information in an online environment (Hennig-Thurau et al., 2004; Phelps et al., 2004; Ho and Dempsey, 2009).

Each of the three motivation variables (The Need to Belong, The Need for Individuation, and Altruism) is proposed to have a positive direct effect on the two variables Forwarding Online Content) (i.e. the frequency of the behavior of forwarding or pushing online content) and Time Online (i.e. the amount of time for which an individual engages in online activities) (Phelps et al., 2004; Ho and Dempsey, 2009).

The other two variables in this group are Personal Growth and Curiosity. ***Personal Growth*** refers to an individual's need to take control and experience new opportunities, roles, and relationships. The need for personal growth causes individuals to forward (push) information via electronic channels (e.g. email and internet) and to consume (pull) information as a means of gaining experience and developing new relationships, opportunities, and roles (Phelps et al., 2004; Ho and Dempsey, 2009). It has been noted that as an individual's age increases their need for personal growth tends to decrease with college aged individuals experiencing a period of inherent conscious growth and engaging in the pursuit of personal growth to a greater extent than midlife adults (Ho and Dempsey, 2009). Consequently, the variable Age is proposed to have a direct negative effect on the variable Personal Growth which in turn has direct positive effects on the two variables Consumption of Online Content (i.e. the amount of time an individual spends seeking or pulling online content) and Forwarding Online Content. ***Curiosity*** is the individual's desire to know or learn and this variable is proposed to have a direct positive effect on the variable Consumption of Online Content (Ho and Dempsey, 2009).

Individual Behaviors

The three variables in this group are Time Online, Consumption of Online Content, and Forwarding Online Content. Each of these variables has been described above in the discussion of the psychological motivation variables that have direct effects on these individual behaviors. ***Time Online*** is directly positively affected by The Need to Belong, The Need for Individuation, and Altruism and it has a direct positive effect on Forwarding Online Content (Phelps et al., 2004; Ho and Dempsey, 2009). The ***Consumption of Online Content*** is directly positively affected by Personal Growth and Curiosity and it also has a direct positive effect on ***Forwarding Online***

Content (Sun et al., 2006; Ho and Dempsey, 2009) which is the dependent variable in this study and is directly positively affected by four psychological motivation variables (The Need to Belong, The Need for Individuation, Altruism, and Personal Growth) and two individual behavior variables (Time Online and Consumption of Online Content).

Theoretical Model

The theoretical model in Figure 1 is based on the review of the related literature and includes nine variables: five exogenous independent variables (Need to Belong, Need for Individuation, Altruism, Age, and Curiosity); and four endogenous variables (Time Online, Personal Growth, Consumption of Online Content, and Forwarding Online Content). Forwarding Online Content is the dependent variable and the other three endogenous variables are intervening variables.

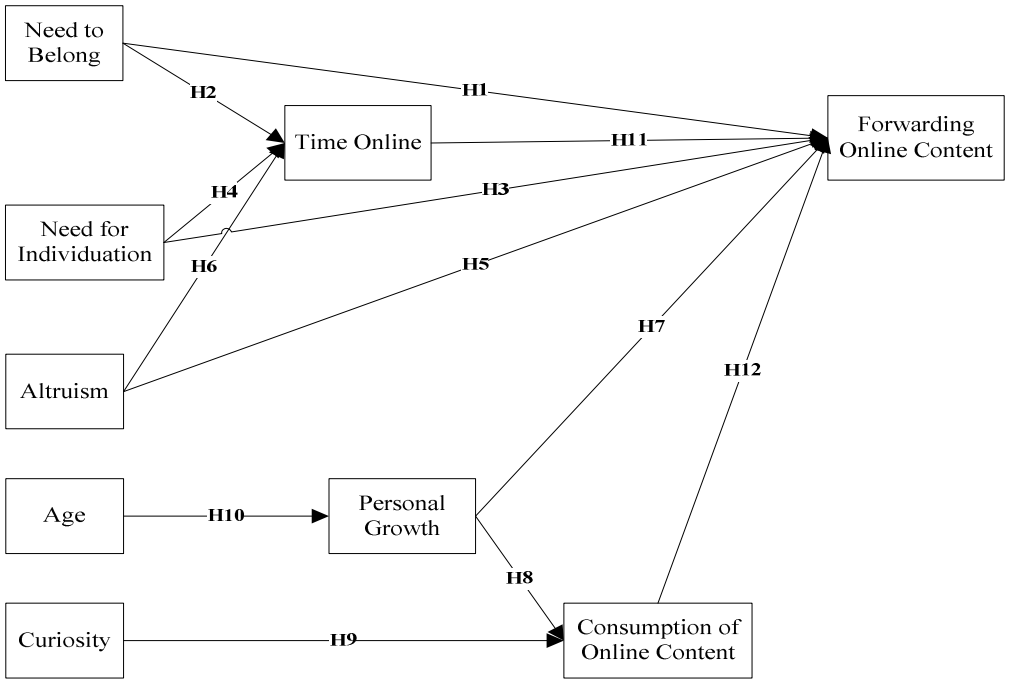

Figure 1. Theoretical model.

Table 2 states explicitly the 12 hypotheses notated on Figure 1 concerning the direct effects and a reference to the source of the hypothesis.

The theoretical model in Figure 1 is related to the model tested in the study by Ho and Dempsey (2009). However, that model did not include the variables Age and Time Online and their causal effects shown in Figure 1 or the causal effect of Personal Growth on Consumption of Online Content. These additional variables and causal effects are derived from concluding remarks about the findings in the studies by Ho and Dempsey (2009), Phelps et al. (2004), and Sun et al. (2006). In Table 2 only the six hypotheses H1, H3, H5, H7, H9, and H12 were tested in

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the study by Ho and Dempsey (2009) and among these only the three hypotheses H3, H5, and H12 were supported. For the other three hypotheses: H1 – the effect was found to be negative but not statistically significant; H7 – the effect was found to be negative and statistically significant; and H9 – the effect was found to be positive but not statistically significant. They concluded that there was a need for the results of their study to be validated and so their six hypotheses (H1, H3, H5, H7, H9, and H12) as well as the six additional hypotheses (H2, H4, H6, H8, H10, and H11) are tested in this study.

Table 2. Research hypotheses

	Hypothesis	Reference
H1	Need to Belong has a significant positive direct effect on Forwarding Online Content	Ho and Dempsey, 2009
H2	Need to Belong has a significant positive direct effect on Time Online	Phelps et al., 2004; Ho and Dempsey, 2009
H3	Need for Individuation has a significant positive direct effect on Forwarding Online Content	Ho and Dempsey, 2009
H4	Need for Individuation has a significant positive direct effect on Time Online	Ho and Dempsey, 2009
H5	Altruism has a significant positive direct effect on Forwarding Online Content	Phelps et al., 2004; Ho and Dempsey, 2009
H6	Altruism has a significant positive direct effect on Time Online	Ho and Dempsey, 2009
H7	Personal Growth has a significant positive direct effect on Forwarding Online Content	Ho and Dempsey, 2009
H8	Personal Growth has a significant positive direct effect on Consumption of Online Content	Ho and Dempsey, 2009
H9	Curiosity has a significant positive direct effect on Consumption of Online Content	Ho and Dempsey, 2009
H10	Age has a significant negative direct effect on Personal Growth	Ho and Dempsey, 2009
H11	Time online has a significant positive direct effect on Forwarding Online Content	Sun et al., 2006; Ho and Dempsey, 2009
H12	Consumption of Online Content has a significant positive direct effect on Forwarding Online Content	Ho and Dempsey, 2009

Note: Significance refers to statistical significance at a level of 0.05 or less.

Table 3 shows an operational definition and the details of the measurement of each of the nine model variables with references to previous studies which were used as sources of existing measuring instruments.

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Table 3. Definitions and measurement of model variables

Model Variable (Label)	Operational Definition	Indicators for Latent Variables	Reference (Measuring Instruments)
Latent Variables: Each indicator is measured on a 7-point Likert scale treated as an interval scale measure.			
Need to Belong (NB)	The extent of an individual's need to be a member of a group.	nb1 - 7	Phelps et al., 2004; Ho and Dempsey, 2009
Need for Individuation (NI)	The extent of an individual's need to be different from others.	ni1 - 7	Yalcinkaya, 2008; Ho and Dempsey, 2009
Altruism (AL)	The extent of an individual's desire to have close and personal relationships with others.	al1 - 5	Phelps et al., 2004; Hennig-Thurau et al. (2004); Ho and Dempsey, 2009
Personal Growth (PG)	The extent of an individual's need to take control and experience new opportunities, roles, and relationships.	pg1 - 8	Phelps et al., 2004; Ho and Dempsey, 2009
Curiosity (CU)	The extent of an individual's desire to know and learn.	cu1 - 5	Ho and Dempsey, 2009
Single Scale Variables: In the questionnaire the following four variables are measured as ordinal scale categorical variables but for the purpose of analyses these measures are converted to interval scale measures using the mid point of each category.			
Age (AG)	The individual's age in years.		Pew Internet and American Life Project, 2010
Time Online (T)	The amount of time an individual spends each week using online information services for any purpose.		Sun et al. (2006); Ho and Dempsey, 2009
Consumption of Online Content (CO)	The amount of time an individual spends each week using online information services to seek (pull) information content.		Sun et al. (2006); Ho and Dempsey, 2009
Forwarding Online Content (F)	The number of times each week an individual passes (pushes) information messages to others using online information services.		Ho and Dempsey, 2009

Data Preparation and Preliminary Analyses

Data Preparation

Starting with the 1,603 responses to the questionnaire missing values were found among responses in 13 of these questionnaires and these were removed from the sample. An additional 357 questionnaires were removed because they included values for model variables which were outliers (i.e. 3 or more standard deviations from the mean). Consequently, the final sample size was reduced to 1,233 which satisfies very adequately the minimum sample size of 350 determined for the study.

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For the latent variables Principle Component factor analysis and Cronbach alpha coefficients were used to establish the construct (convergent and discriminant) validity and the internal consistence reliability of the measures of the indicators, respectively. These techniques were used iteratively in order to arrive at a set of indicators for each latent variable with satisfactory construct validity (i.e. they load significantly only on the associated latent variable with a loading factor of at least 0.4 and an eigenvalue of 1 or more (Straub et al., 2004)) and satisfactory consistency reliability (i.e. with a Cronbach alpha of at least 0.7 (George and Mallery, 2003)). The final factor analysis and Cronbach alpha coefficients are shown in Appendix Tables A1 and A2, respectively. Finally, 10 indicators (nb1, nb2, nb3, ni1, pg5, pg6, pg7, pg8, cu2, and cu3) were removed because they had significant cross loadings on more than one latent variable.

Preliminary Analyses

From the responses to the questions in section 1 of the questionnaire it is seen most respondents are males (62 percent) and almost all of the respondents are between the ages of 12 and 39 years (99 percent) with the largest proportion (45 percent) aged 19 to 25 years and the average age of the respondents is 24 years. Most of the respondents (74 percent) have a bachelor degree. Forty seven percent are students in the age range 12 to 25 years, 32 percent are working as officers, 16 percent are senior executives, and five percent are supervisors/managers/consultants. Ninety eight percent of respondents access online services using either mobile technologies (e.g. smart phones) (63 percent) or at their homes (35 percent). Eighty four percent have more than 15 months experience using online services and the average across all of the respondents is 14 months. Forty one percent are using online services for more than 25 hours each week and the average across all of the respondents is 18 hours each week. In particular, on average online services are being used to search for (pull) information content for 17 hours each week with 54 percent of respondents using online services for this purpose for more than 21 hours each week. On average respondents are forwarding (pushing) information content online 15 times each week with 44 percent of respondents using online services for this purpose more than 21 times each week. Consequently, the respondents have the personal characteristics and online experience required to participate in the study.

Appendix Table A3 shows a range of descriptive statistics for the variables in the theoretical model. It is noted that in each case the magnitudes of skewness and kurtosis are within the acceptable limits of 3 and 7, respectively, required for the use of maximum likelihood estimation in SEM analyses (Kline, 2005). T-tests were used to test for statistically significant differences between the means of the indicators for the latent variables and the *neutral* point 4 on their measurement scales. The results indicate that the respondents have identified themselves significantly ($p < 0.000$) with the characteristics represented by the indicators. They have a significantly strong need to belong to a group, to express their individuality, and for personal growth and they are very curious and altruistic toward others. Also, T-tests were used to examine differences between the means of the distributions for males and females with regard to characteristics of respondents and model variables. The only significant difference ($p < 0.05$) is associated with work position where on average males are employed in more senior positions than females.

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A summary of correlations among model variables and variables used to examine the characteristics of the respondents is shown in Appendix Table A4. For this summary latent variables have been treated as single interval scale variables with values computed as the mean of the values associated with their indicators. It is noted that for correlations involving latent variables the correlation coefficients in Appendix Table A4 has the same nature (i.e. statistical significance and direction) as the coefficients determined when the indicators are examined separately. From the correlations it is seen that older individuals have higher levels of education, occupy more senior work positions, are very likely to push and pull information content using online services, are less altruistic toward others, and have less need to belong to a group. Individuals in senior work positions have been using online services for a long period of time, spend a lot of time online, are very likely to push and pull information using online services, place a high value on their individuality, and have less need to belong to a group. Those who have been using online services for a long period of time spend a lot of time online, push and pull information often, value their individuality highly, and place high importance on personal growth and being altruistic.

It is noted that, although significant correlation coefficients do not necessarily represent significant causal effects, there is partial support among the significant correlations in Appendix Table A4 for all of the 12 causal effects in the theoretical model except for the three effects Age → Personal Growth, Need to Belong → Time Online, and Need to Belong → Forwarding Online Content and it is expected that these three causal effects in the theoretical model may not be significant. Also, from the significant correlations ($p < 0.05$) among model variables 17 additional plausible direct causal relationships are identified that may be included in the theoretical model. These are presented in Table 4 and examined in detail in the next section.

Table 4. Plausible additional direct effects in the theoretical model

Cause	Effect
Age	Forwarding Online Content, Consumption of Online Content, Need to Belong, Altruism
Curiosity	Forwarding Online Content, Time Online, Need to Belong
Personal Growth	Need to Belong, Curiosity, Time Online
Need to Belong	Consumption of Online Content
Altruism	Need to Belong, Consumption of Online Content
Time Online	Consumption of Online Content
Need for Individuation	Consumption of Online Content, Personal Growth, Curiosity

Model Analysis and Development

Figure 2 shows the results of the SEM analysis of the theoretical model in Figure 1 using Amos 5 software. In Figure 2 the direct un-standardized effect is shown first followed by *, **, or *** if the effect is statistically significant at a level of 0.001, 0.01, or 0.05, respectively. In parentheses the standardized effect is shown with S, M, or L to indicate that the magnitude of the effect is small, medium, or large, respectively, and six small effects are highlighted. Table 5 shows the values for the range of fit statistics for the model in Figure 2 recommended by Kline (2005).

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Table 5. Fit statistics for the theoretical model

Model	N	N_c	NC (χ^2/df)	RMR	GFI	AGFI	NFI	IFI	CFI	RMSEA
Theoretical Model	1233	196	1864.357/257 = 7.254	2.351	0.901	0.875	0.837	0.856	0.856	0.071
			R^2: Time Online (0.037); Personal Growth (0.002); Consumption of Online Content (0.026); Forwarding Online Content (0.318)							

Note: R^2 is the proportion of the variance of each endogenous variable that is explained by the variables affecting it.

From Table 5 it is seen that the fit statistics are less than satisfactory. Consequently, it is desirable to seek a model with improved values for the fit statistics. The 17 additional plausible causal effects in Table 4 were added to the theoretical model in Figure 2 and the model was analyzed. From the analysis all small effects or effects which were not statistically significant at a level of 0.05 or less were identified and made optional in a specification search analysis. There were 15 such effects so the specification search analysis tested each of 32,768 (2^{15}) models in the hierarchy. From this analysis the final model with the smallest value for Normed Chi-square was selected and analyzed in detail. The final model is shown in Figure 3 with details of direct effects presented in the same format as in Figure 2 and the fit statistics are presented in Table 6.

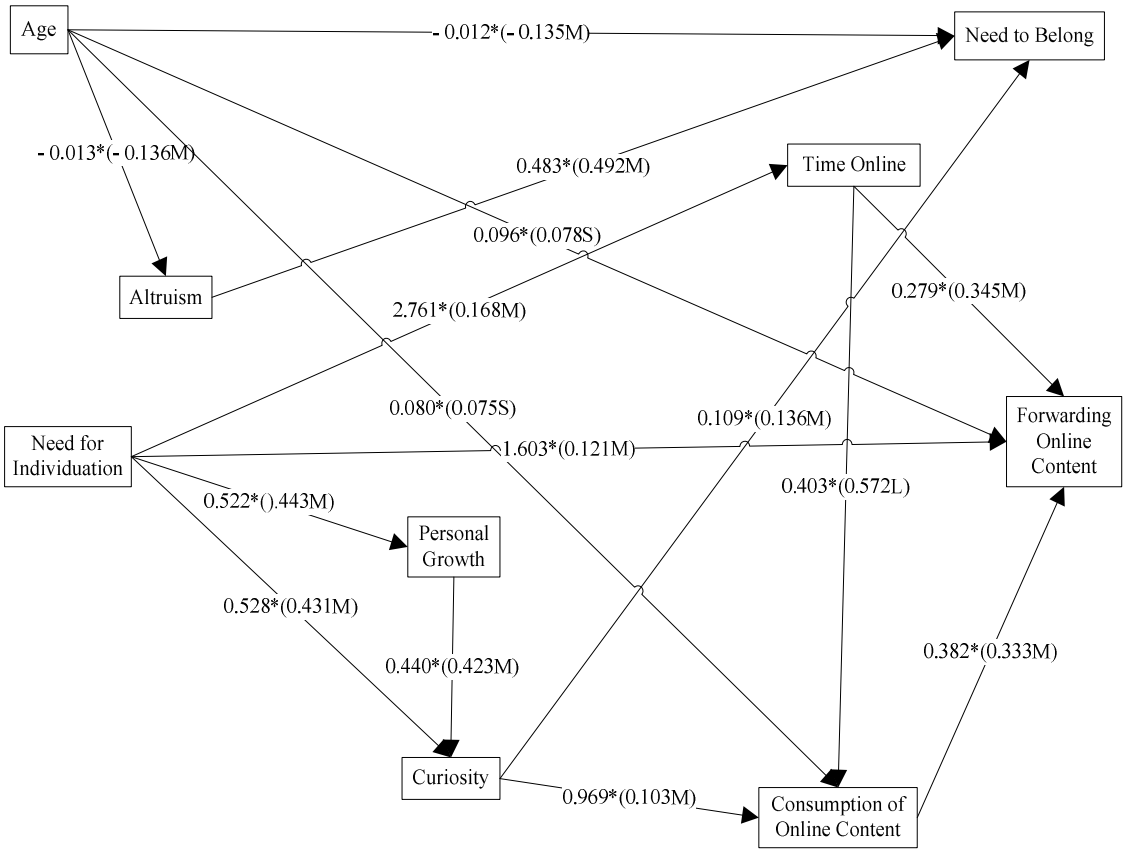

Figure 3. Final model.

Table 6. Fit statistics for the final model

Model	N	N_c	NC (χ^2/df)	RMR	GFI	AGFI	NFI	IFI	CFI	RMSEA
			720.883/263 = 2.741	0.063	0.920	0.914	0.904	0.918	0.919	0.061
Final Model	1233	253	**R^2:** Time Online (0.428); Personal Growth (0.396); Consumption of Online Content (0.357); Curiosity (0.527); Altruism (0.319); Need to Belong (0.396); Forwarding Online Content (0.599)							

Note: R^2 is the proportion of the variance of each endogenous variable that is explained by the variables affecting it.

The final model has very satisfactory fit statistics and reasonable proportions of the variance associated with the endogenous variables are explained by the model. There are two small direct effects in the final model due to Age but all of the other direct effects are at least medium in magnitude and all of the direct effects are statistically significant at a level of 0.001 or less. If these two small effects are removed from the model then the fit statistics are less satisfactory and so they are retained in the final model.

The results of a full SEM analysis of the final model are presented in Table 7 using the same format as above for the details of effects. The statistical significance of indirect effects involving one intervening variable were determined using the method proposed by Sobel (1986) and for two or more intervening variables the guidelines by Cohen and Cohen (1983) were used. Nonparametric bootstrapping using 1000 random samples was used to determine the statistical significance of the total of indirect effects and the total of all effects.

In Table 7 it is noted that all of the effects are statistically significant ($p < 0.001$) even though some are small and this highlights the need to focus on the magnitude and direction of effects rather than only their statistical significance. Forwarding Online Content and Need to Belong emerged in the final model as separate dependent variables and the direct significant causal effect of Need to Belong on Forwarding Online Content proposed in the theoretical model is not supported by the final model. There are no significant mediation effects where the indirect effects of a variable on another variable exceed its direct effect.

Discussion

Interpretation of Effects

As a basis for the discussion of the effects in the final model Table 8 presents a summary of the nature of the totals of effects shown in Table 7.

The discussion of the effects in the final model begins by considering first the two dependent variables:

> ***Forwarding Online Content:*** The effects on the frequency with which an individual forwards online content are positive but the effects due to level of curiosity and need for personal growth are only small. The amount of time for which an individual uses online services has the largest influence on the frequency with which an individual forwards (pushes) online

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content. The next strongest influence is due to the amount of time an individual spends consuming (pulling) online content. These are followed in decreasing order of importance by the individual's need for individuation (i.e. the extent to which the individual needs to be seen as different from others) and the individual's age.

Need to Belong: The effects on the individual's need to belong to a group are positive with the exception of the effect due to age. However, the need for personal growth and the need to be seen as different from others (individuation) have only small effects on the need to belong. The largest effect is due to the extent to which an individual wishes to have close and personal relationships with others (altruism). The individual's level of curiosity has the next most important effect on their need to belong followed by the negative influence due to their age.

Table 7. Analysis of the final model

Variable		Effect	Endogenous Variable						
			Intervening					Dependent	
			Altruism	Consumption of Online Content	Personal Growth	Curiosity	Time Online	Need to Belong	Forwarding Online Content
Exogenous	Age	Direct	-.013*(-.136M)	.080*(.075S)	Nil	Nil	Nil	-.012*(-.135M)	.096*(.078S)
		Indirect	Nil	Nil	Nil	Nil	Nil	AG-AL-NB -.006*(-.067S)	AG-CO-F .031*(.025S)
		Total Indirect	Nil	Nil	Nil	Nil	Nil	-.006*(-.067S)	.031*(.025S)
		Total	**-.013*(-.136M)**	**.080*(.075S)**	**Nil**	**Nil**	**Nil**	**-.018*(-.202M)**	**.127*(.103M)**
	Need for Individuation	Direct	Nil	Nil	.522*(.443M)	.528*(.431M)	2.761*(.168M)	Nil	1.603*(.121M)
		Indirect	Nil	NI-CU-CO .512*(.044S) NI-PG-CU-CO .223*(.020S)	Nil	NI-PG-CU .230*(.187M)	Nil	NI-CU-NB .058*(.059S) NI-PG-CU NB .025*(.025S)	NI-CU-CO-F .195*(.015S) NI-PG-CU-CO-F .085*(.006S)
		Total Indirect	Nil	.735*(.064S)	Nil	.230*(.187M)	Nil	.083*(.089S)	.280*(.021S)
		Total	**Nil**	**.735*(.064S)**	**522*(.443M)**	**.758*(.618L)**	**2.761*(.168M)**	**.083*(.089S)**	**1.883*(.142M)**
Endogenous	Altruism	Direct	Nil	Nil	Nil	Nil	Nil	.483*(.492M)	Nil
		Indirect	Nil	Nil	Nil	Nil	Nil	Nil	Nil
		Total Indirect	Nil	Nil	Nil	Nil	Nil	Nil	Nil
		Total	**Nil**	**Nil**	**Nil**	**Nil**	**Nil**	**.483*(.492M)**	**Nil**
	Personal Growth	Direct	Nil	Nil	Nil	.440*(.423M)	Nil	Nil	Nil
		Indirect	Nil	PG-CU-CO .426*(.044S)	Nil	Nil	Nil	PG-CU-NB .048*(.058S)	PG-CU-CO-F .117*(.015S)
		Total Indirect	Nil	.426*(.044S)	Nil	Nil	Nil	.048*(.058S)	.117*(.015S)
		Total	**Nil**	**.426*(.044S)**	**Nil**	**.440*(.423M)**	**Nil**	**.048*(.058S)**	**.117*(.015S)**
	Curiosity	Direct	Nil	.969*(.103M)	Nil	Nil	Nil	.109*(.136M)	Nil
		Indirect	Nil	Nil	Nil	Nil	Nil	Nil	CU-CO-F .370*(.043S)
		Total Indirect	Nil	Nil	Nil	Nil	Nil	Nil	.370*(.043S)
		Total	**Nil**	**969*(.103M)**	**Nil**	**Nil**	**Nil**	**.109*(.136M)**	**.370*(.043S)**
	Consumption of Online Content	Direct	Nil	Nil	Nil	Nil	Nil	Nil	.382*(.333M)
		Indirect	Nil	Nil	Nil	Nil	Nil	Nil	Nil
		Total Indirect	Nil	Nil	Nil	Nil	Nil	Nil	Nil
		Total	**Nil**	**Nil**	**Nil**	**Nil**	**Nil**	**Nil**	**382*(.333M)**
	Time Online	Direct	Nil	.403*(.572L)	Nil	Nil	Nil	Nil	.279*(.345M)
		Indirect	Nil	Nil	Nil	Nil	Nil	Nil	T-CO-F .154*(.190S)
		Total Indirect	Nil	Nil	Nil	Nil	Nil	Nil	.154*(.190S)
		Total	**Nil**	**.403*(.572L)**	**Nil**	**Nil**	**Nil**	**Nil**	**.433*(.535L)**

Note: * indicates statistical significance ($p < 0.001$).

Considering the two exogenous variables (Age and Need for Individuation) it is seen that in addition to their important effects on the variables Forwarding Online Content and Need to Belong, discussed above, each has important effects on variables that intervene between them and the two dependent variables:

Age has only a small positive effect on an individual's desire to pull (consume) information online but it has an important negative effect on the individual's desire to have close personal relationships with others (altruism).

Table 8. Summary of the nature of total effects

	Variable	Endogenous						
		Intervening					Dependent	
		Altruism	Consumption of Online Content	Personal Growth	Curiosity	Time Online	Need to Belong	Forwarding Online Content
Exogenous	Age	Negative, Medium, Only direct	Positive, Small, Only direct	Nil	Nil	Nil	Negative, Medium, Mainly direct	Positive, Medium, Mainly direct
	Need for Individuation	Nil	Positive, Small, Only indirect	Positive, Medium, Only direct	Positive, Large, Mainly direct	Positive, Medium, Only direct	Positive, Small, Only indirect	Positive, Medium, Mainly direct
Endogenous	Altruism	Nil	Nil	Nil	Nil	Nil	Positive, Medium, Only direct	Nil
	Personal Growth	Nil	Positive, Small, Only indirect	Nil	Positive, Medium, Only direct	Nil	Positive, Small, Only indirect	Positive, Small, Only indirect
	Curiosity	Nil	Positive, Medium, Only direct	Nil	Nil	Nil	Positive, Medium, Only direct	Positive, Small, Only indirect
	Consumption of Online Content	Nil	Nil	Nil	Nil	Nil	Nil	Positive, Medium, Only direct
	Time Online	Nil	Positive, Large, Only direct	Nil	Nil	Nil	Nil	Positive, Large, Mainly direct

Need for Individuation has only a small positive effect on the individual's desire to pull information online. Its strongest positive effect is on the desire to gain knowledge and learn (curiosity) and, in decreasing order of importance, it has direct positive effects on the need for personal growth and the amount of time an individual spends online.

The five intervening variables (Altruism, Consumption of Online Content, Personal Growth, Curiosity, and Time Online) also have important effects on both dependent variables (Forwarding Online Content and Need to Belong). As noted above, altruism only influences the need to belong and consumption of online content only influences the extent to which an individual forwards online content. In addition to having small positive effects on each of the dependent variables the need for personal growth also has a small positive effect on the extent to which an individual pulls online content. However, it has an important direct positive effect on the individual's desire

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to know and learn (curiosity). Apart from having an important positive effect on the need to belong and a less important positive effect on forwarding online content behavior an individual's level of curiosity has an important positive effect on the extent to which they consume online content. The amount of time they spend online has very important positive effects on the extent to which individuals both push and pull online content.

The structure of the final model represents two connected sub models: one determines Need to Belong and the other determines Forwarding Online Content. The two sub models are related by the effects of four variables (Age, Need for Individuation, Personal Growth, and Curiosity) which are influential in both. Age and Curiosity have more influence on Need to Belong than Forwarding Online Content**,** the reverse is true for Need for Individuation, and Personal Growth has only small effects on both Need to Belong and Forwarding Online Content. Altruism only influences Need to Belong while Consumption of Online Content and Time Online only influence Forwarding Online Content.

Comparison with the Findings of Previous Studies

Table 9 identifies the research hypotheses associated with the theoretical model which are supported by the findings of the study. These hypotheses confirm the important roles played by four the variables Need for Individuation, Curiosity, Consumption of Online Content, and Time Online.

Table 9. Hypotheses supported by the findings

	Hypothesis	Reference
H3	Need for Individuation has a significant positive direct effect on Forwarding Online Content	Ho and Dempsey, 2009
H4	Need for Individuation has a significant positive direct effect on Time Online	Ho and Dempsey, 2009
H9	Curiosity has a significant positive direct effect on Consumption of Online Content	Ho and Dempsey, 2009
H11	Time Online has a significant positive direct effect on Forwarding Online Content	Sun et al., 2006; Ho and Dempsey, 2009
H12	Consumption of Online Content has a significant positive direct effect on Forwarding Online Content	Ho and Dempsey, 2009

Note: All direct effects are statistically significant ($p < 0.001$).

Table 10 identifies hypotheses which propose significant direct positive causal effects among variables but the causal effects were not found to be significant in the final model. However, in each case there is a significant positive correlation between the variables in each of the hypotheses. This is considered to provide partial support for the hypothesized effects and indicates that further studies should reconsider these direct causal relationships.

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Table 10. Hypotheses partially supported by significant correlations

	Hypothesis	Correlation	Reference
H5	Altruism has a significant positive direct effect on Forwarding Online Content	Positive, significant	Phelps et al., 2004; Ho and Dempsey, 2009
H6	Altruism has a significant positive direct effect on Time Online	Positive, significant	Ho and Dempsey, 2009
H7	Personal Growth has a significant positive direct effect on Forwarding Online Content	Positive, significant	Ho and Dempsey, 2009
H8	Personal Growth has a significant positive direct effect on Consumption of Online Content	Positive, significant	Ho and Dempsey, 2009

Note: For statistically significant correlations $p < 0.05$.

Table 11 identifies research hypotheses where there is no support for significant causal effects and furthermore there is no significant correlation between the variables in each hypothesis although the correlations do have the same directions as those specified in the hypotheses.

Table 11. Hypotheses not supported by the findings

	Hypothesis	Correlation	Reference
H1	Need to Belong has a significant positive direct effect on Forwarding Online Content	Positive, not significant	Ho and Dempsey, 2009
H2	Need to Belong has a significant positive direct effect on Time Online	Positive, not significant	Phelps et al., 2004; Ho and Dempsey, 2009
H10	Age has a significant negative direct effect on Personal Growth	Negative, not significant	Ho and Dempsey, 2009

Note: For statistically significant correlations $p < 0.05$.

Overall there is a reasonable amount of full or partial support for the relationships between variables specified in the previous studies by Sun et al. (2006), Ho and Dempsey, (2009), and Phelps et al. (2004) which were the basis of the formulation of the theoretical model used in this study.

Findings Not Reported in Previous Studies

Table 12 presents new findings which have not been reported in previous studies. From Table 12 it is seen that among these new findings the most noteworthy are that as an individual's:

- Age increases the need to belong to a group and the desire to have close personal relationships decrease while the frequency with which they forward online content increases;
- Need to be different increases so does their need for personal growth and their level of curiosity;

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- Need for personal growth increases so does their curiosity and this causes their need to belong to increase;
- Desire to have close personal relationships increases so does their need to belong to a group;
- Time spent online increases so does the time spent pulling information.

Although these new findings appear to be intuitively correct there is a definite need for their validity and reliability to be tested in further studies.

Table 12. New findings

Age has a significant: • Negative direct medium effect on Altruism • Positive direct small effect on Consumption of Online Content • Negative mainly direct medium effect on Need to Belong • Positive mainly direct medium effect on Forwarding Online Content	**Need for Individuation** has a significant: • Positive indirect small effect on Consumption of Online Content • Positive direct medium effect on Personal Growth • Positive mainly direct large effect on Curiosity • Positive indirect small effect on Need to Belong
Altruism has a significant • Positive direct medium effect on Need to Belong	**Personal Growth** has a significant: • Positive direct medium effect on Curiosity • Positive indirect small effect on Need to Belong
Curiosity has a significant: • Positive direct medium effect on Need to Belong • Positive indirect small effect on Forwarding Online Content	**Time Online** has a significant: • Positive direct large effect on Consumption of Online Content

Practical Implications of the Findings

Based on the findings it is possible to suggest a set of practical objectives and actions designed to increase the frequency of forwarding online content. Table 13 sets out, in deceasing order of importance actions to be taken to achieve the objective of increasing forwarding online content behavior. The actions are presented in a hierarchy whereby a particular action may refer to a subsequent practical objective and its associated actions.

From Table 13 at the bottom of the hierarchical sequence of objectives and associated actions it is clear that an individual's need for individuation and their age are of primary interest in increasing forwarding online content behavior. In order to encourage this behavior it is important to:

- Design the functionality of the technology and the content to be forwarded so that it is appealing to older individuals who, based on the average age of respondents in the study, are older than 24 years;
- Deliberately accommodate people who have a strong need for individuation. These people need to feel that they are different from others, they like to be treated as individuals, and they

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agree strongly that the following statements apply to them: my friends think that I have special characteristics and that I am a good source of advice and information; my talents are different from those of my friends; I often have different opinions to other people in my group; and my contributions to my group are different from those of other members.

Table 13. Practical objectives and actions for increasing forwarding of online content behavior

Objective	Action	Refer to:
1. Primary Objective: Increase forwarding online content behavior.	**1.1** Increase the time a person spends online.	Objective 2
	1.2. Increase the amount of time a person spends pulling online information.	Objective 3
	1.3 Deliberately accommodate people who have a strong need for individuation.	Objective 2
	1.4 Deliberately accommodate older people.	Discussion following the table
2. Deliberately accommodate people who have a strong need for individuation.	-	Discussion following the table
3. Increase the amount of time a person spends pulling online information.	**3.1** Deliberately accommodate people with a high level of curiosity.	Objectives 2 and 4
	3.2 Increase the time a person spends online.	Objective 2
4. Deliberately accommodate people who have a strong need for personal growth.	**4.1** Deliberately accommodate people who have a strong need for individuation.	Objective 2

Consequently, messages intended to be forwarded should be appealing to such individuals and this may be achieved by: designing the content to encourage people to believe that this is special information targeted at them as discerning individuals; offering links to more details about the message; asking them for their personal opinion concerning the message, its contents, and its presentation format; making it clear that if they forward the message to others that they will provide valuable specialized assistance to those people who will be very appreciative and hold them in high regard; and providing the opportunity for them to easily add their own acknowledged “expert” comments and opinions before forwarding the message to others.

Conclusion

The study examined psychological motivations and related individual behaviors identified in previous studies that influence an individual to forward (push) messages to others using electronic means in online environments. From a theoretical perspective the study has shown that an individual’s need for individuation (i.e. the need to be seen as different from others) is a

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primary independent motivation for forwarding online content. It also has effects on other important attributes (the pulling of online information, the need for personal growth, curiosity, and the amount of time spent online) which in turn have their own effects on forwarding online content behavior with the most important effects being due to the amount of time spent online and the pulling of online information. The age of the individual was also found to be an important factor having a positive effect on forwarding online content behavior. Interestingly, the need for an individual to belong to a group was not found to have a significant effect on forwarding online content behavior and it emerged as a separate dependent variable in the final model mainly affected positively by the extent to which an individual displays altruism and curiosity and negatively by the individual's age. Although causal effects reported in previous studies were either fully supported or partially supported by statistically significant correlations the findings identified new causal effects due to Age, Need for Individuation, Altruism, Personal Growth, Curiosity, and Time Online (see Table 12) all of which need to be validated in further studies.

From a practical perspective the study has identified a hierarchical sequence of practical objectives and associated actions that may be taken in order to increase the behavior of forwarding online content (see Table 13). The fundamental actions require accommodating an individual's need for individuation and acknowledging the positive effect of age on forwarding online content. Practical suggestions are offered for addressing an individual's need for individuation focusing on the design of the functionality of technology used for distributing content and the design of the content to be forwarded.

It is strongly recommended that the study be repeated in order to improve the external validity of the findings, especially the new findings (Table 12) and because this is the first study of this kind conducted in Thailand. In particular, further studies should address the possible limitations of this study which include the restricted age range (12 - 46 years) of participants, the large proportion (47 percent) of participants who are students, and the large proportion (62 percent) who are males. The study did not place any limitation on the type of online message being forwarded or the technology used and this leaves open the possibility for further studies to consider different types of messages and specific types of technologies. Finally, because of the importance of the need for individuation in relation to forwarding online content behavior it is important to further understand this psychological construct and its possible causes.

References

Brown, J., Broderick, A., and Lee, N. (2007). Word of Mouth Communication within Online Communities: Conceptualizing the Online Social Network. *Journal of Interactive Marketing, 21*(3), 2-20.

Cheung, C., Lee, M., & Rabjohn, N. (2008). The Impact of Electronic Word of Mouth. *Internet Research, 18*(3), 229-247.

Chiu, H., Lee, M., & Chen, J. (2008). Viral Marketing: a Study of Email Spreading Behavior Across Gender. *Journal of Website Promotion, 2*(3), 17-30.

© JITI 2011

Cohen, J., & Cohen, P. (1983). *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences* (3rd ed.). New Jersey: Erlbaum.

Cruz, D., & Fill, C. (2008). Evaluating Viral Marketing: Isolating the Key Criteria. *Marketing Intelligence & Planning, 26*(7), 743-758.

Dalsgaard, S. (2008). Facework on Facebook. *Anthropology Today, 24*(6), 8-27.

Davis, L., Wang, S., & Lindridge, A. (2008). Culture Influences on Emotional Responses to Online Store Atmospheric Cues. *Journal of Business Research, 61*, 806-812.

De Bruyn, A., & Lilien, G. (2008). A Multi Stage Model of Word of Mouth Influence Through Viral Marketing. *International Journal of Research in Marketing, 25*, 151-163.

Dobele, A., Lindgreen, A., & Beverland, M. (2007). Why Pass on Viral Messages? Because They Connect Emotionally. *Business Horizons*, 50, 291-304.

Dwyer, P. (2007). Measuring the Value of Electronic Word of Mouth and its Impact in Consumers Communities. *Journal of Interactive Marketing, 21*(2), 63-79.

George, D., & Mallery, P. (2003). *SPSS for Windows step by step: A simple guide and reference. 11.0 update*, Boston: Allyn and Bacon.

Goldsmith, R. (2002). *Viral Marketing: Get Your Audience to Do Your Marketing for You*. London: Pearson Education Limited.

Henning-Thurau, T., Gwinner, K., Walsh, G., & Gremler, D. (2004). Electronic Word of Mouth via Consumer Opinion Platforms: What Motivates Consumers to Articulate Themselves on the Internet? *Journal of Interactive Marketing, 18*(1), 38-52.

Ho, J., & Dempsey, M. (2009). Viral Marketing: Motivations to Forward Online Content. *Journal of Business Research*, doi:10.1016/j. jbusres.2008.08.010.

Hsu, C., & Lin, J. (2008). Acceptance of Blog Usage: The Roles of Technology Acceptance, Social Influence and Knowledge Sharing Motivation. *Information and Management, 45*, 65-74.

Huang, C., Lin. T., & Lin, K. (2008). Factors Affecting Pass-along Email Intention (PAEIs): Integrating the Social Capital and Social Cognition Theories. *Electronic Commerce Research and Application, 8*, 160-169.

Kline, R. B. (2005). *Principles and Practice of Structural Equation Modeling*. London: Guilford Press.

Knowledge@Wharton (2009). The Buzz Starts Here: Finding the First Mouth for Word of Mouth Marketing, *Knowledge@Wharton*, Retrieved March 10, 2009, from http:// knowledge.wharton.upenn.edu/article.cfm?articleid=2170.

© 2011 JITI

Ladhari, R. (2007). The Effect of Consumption Emotions on Satisfaction and Word of Mouth Communications. *Psychology & Marketing*, *24*(12), 1085-1108.

Lam, H., & Wu, C. (2009) Finding Influential eBay Buyers for Viral Marketing - A Conceptual Model of BuyerRank. *International Conference on Advanced Information Networking and Applications*, Perth, Australia.

Li, Y., Lai, C., & Lin, C. (2009). Discovering Influential Nodes for Viral Marketing. *Proceedings of the 42nd Hawaii International Conference on System Science*, Hawaii, 1-10.

Mangold, W., & Faulds, D. (2009). Social Media: The New Hybrid Element of the Promotion Mix. *Business Horizons*, *52*, 357-365.

Naone, E. (2008, Mach/April). Between Friends. *Technology Review*, 42-49.

Norman, A., & Russell, C. (2006). The Pass-along Effect: Investigating Word of Mouth Effects on Online Survey Procedures. *Journal of Computer-Mediated Communication*, *11*, 1085-1103.

Nutley, M. (2007, July 17). How to Win Friends and Influence People - the Social Networking Way. *Marketing Week*.

Okazaki, S. (2008). Determinant Factors of Mobile Based Word of Mouth Campaign Referral Among Japanese Adolescents. *Psychology & Marketing*, *25*(8), 714-731.

Pew Internet and American Life Project (2010). Social Media and Mobile Internet Use Among Teens and Young Adults. Retrieved August 10, 2010, from http://pewinternet.org/Reports/2010/Social-Media-and-Young-Adults.aspx.

Pew Research Center (2010). Millennials: A Portrait of Generation Next, Confident, Connected, Open to Change, *Pew Research Center*. Retrieved April 20, 2010, from http://pewsocialtrends.org/files/2010/10/millennials-confident-connected-open-to-change.pdf.

Phelps, J., Lewis, R. Mobilio, L., Perry, D., & Raman, N. (2004, December). Viral Marketing or Electronic Word of Mouth Advertising: Examining Consumer Response and Motivations to Pass Along Email. *Journal of Advertising Research*, 333-348.

Rau, P., Gao, Q., and Ding, Y. (2008). Relationship between the Level of Intimacy and Lurking in Online Social Network Services. *Computers in Human Behavior*, *24*(6), 2757–2770.

Singh, T., Veron-Jackson, L., & Cullinane, J. (2008). Blogging: a New Play in Your Marketing Game Plan, *Business Horizons*, *51*, 281-292.

Sobel, M. E. (1986). Some new results on indirect effects and their standard errors in covariance structure models. In N. B. Tuma (Ed.), *Sociological Methodology*, Jossey-Bass, San Francisco, 159-186.

© JITI 2011

Sombutpibool, P. (2011). The Adoption of Online Social Networks in Thailand. *Journal of Information Technology Impact*, *11*(1), 1-34.

Steinfield, C., Ellison, N., & Lampe, C. (2008). Social Capital, Self-esteem, and Use of Online Social Network Sites: A Longitudinal Analysis. *Applied Developmental Psychology*, *29*(6), 434–445.

Straub, D., Boudreau, M-C., & Gefen, D. (2004). Validation Guidelines for IS Positivist Research. *Communications of the Association of Information Systems*, *13*, 380-427.

Sun, T., Youn, S., Wu, G., & Kuntaraporn, M. (2006). Online Word of Mouth (or mouse): an Exploration of its Antecedents and Consequences. *Journal of Computer-Mediated Communication*, *11*, 1104-1127.

Wang, S., & Noe, R. (2010). Knowledge Sharing: a Review and Directions for Future Research, *Human Resource Management Review*, *20*, 115-131.

Wang, T. (2008). An Agent Based Model of Viral Marketing an Agent-based Model of Viral Marketing: Comparing Online Based Viral and Traditional Marketing in a Closed System for Fashion Trends in a Competitive Setting, *CUREJ: College Undergraduate Research Electronic Journal*, University of Pennsylvania. Retrieved October 1, 2009, from http:// repository.upenn.edu/curej/109, Viewed 1 October 2009.

Yalcinkaya., G., (2008). A Culture Based Approach to Understanding the Adoption and Diffusion of New Products Across Countries. *International Marketing Review*, *25*(2), 202-214.

Yu, T., Lu, L., & Liu, T. (2010). Exploring Factors that Influence Knowledge Sharing Behavior via Weblogs. *Computers in Human Behavior*, *26*, 32-41.

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APPENDIX

A1 Questionnaire

The questionnaire has been notated to show the labels for variables and indicators and their measurement scales.

Section I: Personal Information

1. *Age in Years:* (**AG**) ○ 12 - 18 (**15**) ○ 19 - 25 (**22**) ○ 26 – 32 (**29**) ○ 33 – 39 (**36**) ○ 40 – 46 (**43**) ○ 47 – 53 (**50**) ○ 54 - 60 (**57**) ○ More than 60 (**67**)

2. *Gender:* (**G**) ○ Female (**1**) ○ Male (**2**)

3. *Level of Education:* (**E**) ○ Secondary/High School (**12**) ○ Bachelor Degree (**16**) ○ Master Degree (**18**)

○ Doctoral Degree (**22**)

4. *Work Position:* (**W**) ○ Student (**1**) ○ Officer (**2**) ○ Supervisor/Manager (**3**) ○ Consultant (**4**) ○ Senior Executive (**5**)

*Questions 5 to 9 refer to **online information services** which include all of the online internet based services such as forums, chat rooms, bulletin boards, weblogs, email, messaging services, and internet telephony that are available to you through networks and at web sites and social network sites using smart and mobile phones and computers of all types.*

5. *How long have you been using online information services?* (**EX**) ○ Less than 1 month (**1**) ○ 1 - 5 months (**3**) ○ 6 - 10 months (**8**) ○ 11 – 15 (**13**) ○ More than 15 months (**15**)

6. *On average **how many hours each week** do you spend using online information services for any reason?* (**T**)

○ Less than 2 (**1**) ○ 2 – 4 (**3**) ○ 5 – 7 (**6**) ○ 8 – 10 (**9**) ○ 11 – 13 (**12**) ○ 14 – 16 (**15**) ○ 17 – 19 (**18**) ○ 20 – 22 (**21**) ○ 23 – 25 (**24**) ○ More than 25 (**27**)

7. *The place where you **mainly use** online information services:* (**P**) ○ Home (**1**) ○ School or University Campus (**2**) ○ Net Café (**3**) ○ Mobile technologies (e.g. laptop, mobile phone) (**4**)

8. *On average **how many times each week** do you **pass forward** (**pass on** or **push**) information content or messages to other people or places using online information services?* (**F**)

○ Never (**0**) ○ 1 – 3 (**2**) ○ 4 – 6 (**5**) ○ 7 – 9 (**8**) ○ 10 – 12 (**11**) ○ 13 – 15 (**14**) ○ 16 – 18 (**17**) ○ 19 – 21 (**20**) ○ More than 21 (**22**)

9. *On average **how many hours each week** do you spend using online information services **to search for** (**seek** or **find** or **pull**) information content or messages from other online sources?* (**CO**)

○ Never (**0**) ○ 1 – 3 (**2**) ○ 4 – 6 (**5**) ○ 7 – 9 (**8**) ○ 10 – 12 (**11**) ○ 13 – 15 (**14**) ○ 16 – 18 (**17**) ○ 19 – 21 (**20**) ○ More than 21 (**22**)

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Section II: Personal Characteristics.

Responses were scored on a scale ranging from *not at all like me* (**1**) to *extremely like me* (**7**) with the *neutral* point (**4**).

Variable	Indicator	Characteristic
Need to Belong (**NB**)	nb1	I want others to accept me.
	nb2	I am easily hurt when I feel that others do not accept me.
	nb3	I believe chatting with like-minded people is nice.
	nb4	I value my relationships with other people in my group.
	nb5	I like being part of a group.
	nb6	Being a member of a group is very important to me.
	nb7	I care very much about socializing with my friends.
Need for Individuation (**NI**)	ni1	I do not like to be exactly like other people.
	ni2	My friends think that I am a good source of advice and information.
	ni3	My friends think I have special characteristics.
	ni4	I like to be treated as an individual.
	ni5	My talents are different from those of my friends.
	ni6	My contributions to my group are different from those of other members.
	ni7	I often have different opinions to other people in my group.
Personal Growth (**PG**)	pg1	I like new experiences.
	pg2	I like to create new opportunities for myself.
	pg3	I like challenges.
	pg4	I welcome new ideas.
	pg5	I like to be in control of my life.
	pg6	I have a good sense of where I am headed in my life.
	pg7	I like to determine the role/position that I have in a group.
	pg8	I like to play a leadership role.
Curiosity (**CU**)	cu1	I like to ask questions.
	cu2	I am curious about many things.
	cu3	I want to learn more and gain more knowledge.
	cu4	My friends think I am inquisitive.
	cu5	I spend a lot of time seeking information about many things.
Altruism (**AL**)	al1	I like to help other people.
	al2	I like to share my experiences with my friends.
	al3	I like to share my feelings with my friends.
	al4	I like to share my knowledge with others who I like.
	al5	I enjoy having close personal relationships with others.

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Table A1. Factor analysis

Indicators	**Factors**				
	Altruism	Personal Growth	Need for Individuation	Need to Belong	Curiosity
AL3	**.737**	.108	.103	.226	.133
AL4	**.723**	.164	.133	.102	.154
AL2	**.699**	.282	.143	.142	.223
AL5	**.657**	.145	.105	.245	.120
AL1	**.621**	.296	.176	.142	.088
PG1	.181	**.789**	.126	.106	.116
PG3	.168	**.779**	.122	.075	.122
PG2	.192	**.772**	.161	.126	.145
PG4	.264	**.671**	.040	.114	.177
NI5	.078	.171	**.816**	.018	.103
NI3	.110	.154	**.742**	.081	.158
NI4	.136	-.063	**.679**	.159	-.026
NI6	.077	.066	**.645**	.095	.271
NI2	.189	.208	**.572**	.122	.178
NB5	.184	.082	.132	**.818**	.024
NB6	.117	-.011	.223	**.795**	.095
NB7	.216	.167	.073	**.745**	.115
NB4	.179	.173	.025	**.737**	.029
CU4	.155	.075	.218	.082	**.799**
CU1	.167	.275	.179	.087	**.696**
CU5	.265	.205	.160	.065	**.637**

Total Variance Explained

Component	**Initial Eigenvalues**	**Percentage of Variance**	**Cumulative Percentage**	**Rotation Sums of Squared Loadings**		
				Total	Percentage of Variance	Cumulative Percentage
Altruism	6.914	32.924	32.924	2.865	13.641	13.641
Personal Growth	1.995	9.499	42.423	2.794	13.306	26.946
Need for Individuation	1.874	8.923	51.346	2.748	13.087	40.034
Need to Belong	1.206	5.742	57.088	2.683	12.774	52.808
Curiosity	1.001	4.713	61.801	1.889	8.993	61.801

Notes: (a) Extraction Method: Principal Component Analysis, Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 6 iterations, **(b)** Kaiser-Meyer-Olkin Measure of Sampling Adequacy: 0.912, **(c)** Bartlett's Test of Sphericity: Chi-Square 9972.607 (approx.), degrees of freedom 210, and statistical significance 0.000, **(d)** Factors with eigenvalues less than 1 are not shown, **(e)** Significant factor loadings are highlighted.

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Table A2. Internal consistency reliability

Variable	Indicators	Cronbach Alpha	Variable	Indicators	Cronbach Alpha
Need to Belong	nb 4 -7	0.8277	Curiosity	cu 1, 4, and 5	0.7073
Need for Individuation	ni 2 - 6	0.7824	Altruism	al 1 - 5	0.8205
Personal Growth	pg 1 - 4	0.8288			

Note: For Cronbach alpha: 0.9 ≤ Excellent ≤ 1; 0.8 ≤ Good < 0.9; 0.7 ≤ Acceptable < 0.8 (George and Mallery, 2003).

Table A3. Descriptive statistics for model variables

Model Variables	Mean	Standard Deviation	Skewness	Kurtosis	Model Variables	Mean	Standard Deviation	Skewness	Kurtosis
Age	23.92	6.374	.518	.040	Personal Growth				
Time Online	17.77	9.654	-.422	-1.491	PG1	6.29	.890	-1.018	.000
Forwarding Online Content	14.51	7.783	-.373	-1.488	PG2	6.29	.850	-.931	-.087
Consumption of Online Content	16.64	6.792	-.781	-.967	PG3	5.91	1.090	-.644	-.548
Need to Belong					PG4	6.29	.824	-.877	-.142
NB4	6.23	.881	-.874	-.200	Curiosity				
NB5	5.96	1.004	-.618	-.512	CU1	5.73	1.015	-.334	-.690
NB6	5.75	1.050	-.391	-.732	CU4	5.35	1.150	-.240	-.477
NB7	5.84	1.003	-.519	-.452	CU5	5.68	1.048	-.431	-.517
Need for Individuation					Altruism				
NI2	5.61	.974	-.292	-.422	AL1	5.95	.916	-.401	-.810
NI3	5.09	1.057	-.065	-.310	AL2	6.14	.834	-.566	-.599
NI4	4.86	1.425	-.292	-.302	AL3	5.88	1.060	-.652	-.366
NI5	4.92	1.130	.037	-.321	AL4	6.22	.845	-.781	-.294
NI6	5.18	1.089	-.219	-.153	AL5	5.93	1.034	-.672	-.337

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Table A4. Correlation coefficients for respondent characteristics and model variables

Variable		Personal Characteristic			Model Variable							
		Level of Education	Work Position	Months of Online Experience	Age	Time Online	For-warding Online Content	Con-sumption of Online Content	Need to Belong	Need for Indi-viduation	Personal Growth	Curiosity
Characteristic	Level of Education	1										
	Work Position	**.164**	1									
	Months of Online Experience	.001	**.082**	1								
Model Variable	Age	**.548**	**.363**	.011	1							
	Time Online	.023	**.155**	**.422**	*-.014*	1						
	Forwarding Online Content	**.098**	**.171**	**.330**	**.099**	**.559**	1					
	Consumption of Online Content	**.065**	**.101**	**.297**	**.066**	**.583**	**.559**	1				
	Need to Belong	***-.115***	***-.108***	.047	***-.181***	.054	.051	**.058**	1			
	Need for Individuation	.049	**.079**	**.076**	.036	**.152**	**.198**	**.125**	**.326**	1		
	Personal Growth	*-.006*	.035	**.123**	*-.030*	**.113**	**.150**	**.128**	**.317**	**.341**	1	
	Curiosity	.005	.002	.006	*-.017*	**.090**	**.154**	**.137**	**.280**	**.461**	**.469**	1
	Altruism	***-.074***	*-.027*	**.092**	***-.128***	**.137**	**.154**	**.107**	**.482**	**.400**	**.540**	**.505**

Note: (a) Highlighted coefficients are statistically significant ($p < 0.05$) (2-tailed), **(b)** Negative coefficients are in italics, **(c)** Shaded cells identify correlations associated with causal effects in the theoretical model.

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