

Projecting the Mental Model of Social Networking Site Usage

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Abstract

The growth of online social networking sites (SNS) has created a new world of connection and communication for online users. SNS usage has become an important part of people's daily lives. This study aims to obtain new insights towards SNS usage behaviour. Based on participants' mental models, it is hoped to make more clear exposition about their perceptions and experiences as well as to explore what factors affect their behaviour for using social networking sites. A blend of qualitative methodologies was adopted for data collection and analysis, including the Zaltman metaphor elicitation technique (ZMET) method, the laddering technique, and the means-end chain theory. The results of this study show that the most important values of using SNS include its convenience, maintaining relationship, gaining relaxation, as well as reaching coherence. Additionally, participants pointed out they cared about their online privacy issues very much and had found some potential dangers; however, they continued to use these sites because of the great benefits and enjoyment.

Keywords: social networking sites, projective technique, Zaltman metaphor elicitation technique, mental model, means-end chain theory

1. Introduction

With the advancement and attractiveness of Web 2.0 technology, online social networking sites (SNSs) such as Facebook, Google+, Instagram, Twitter, and LINE, have emerged as rapidly growing mechanisms that allow users to communicate with each other for sharing information, posting videos, pictures, comments, and messages at any time and from any places around the world. SNSs usage has become increasingly more influential on most Internet users' daily lives and radically have changed how they spend their time online. As SNSs continue to evolve at a breakneck speed, so does the usage growth on the respective platforms. According to the 2016 Nielsen Company's report [1], the global average time spent per person on social networking sites is now nearly five and half hours per month. In addition, researchers from the Pew Research Center's Internet found that nearly 80 percent of online adults used social networking sites, and almost 88% of teens and young adults were a member of at least one social network [2-3].

Social networking sites support individuals to present themselves, articulate their social networks, and establish or maintain connections with others - not only in forming but also maintaining relationships. In recent years, these sites have been the

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fastest-expanding websites [4]. The growth of online social networks has created a new world of connection and communication for online users. However, it is not only changing how online users interact with one another, but also changing how businesses touch with their consumers. The popularity of social networking is increasing very rapidly, and, therefore, businesses are turning to these platforms in order to promote their products and to reach potential consumers. This is new opportunities for businesses to communicate with consumers for gaining much more transparency and ultimately to build profitable relationships with their consumers. It is predicted that US advertisers will reach \$2.6 billion to place advertisements on social networking sites by the end of 2012, up more than \$1.2 billion from 2008 [5]. This progress illustrates the increasing influence of social networking sites in modern business environment.

These phenomena have attracted much attention of practitioners and researchers to question what factors may influence the usage behavior on SNSs [6-7]. Yet despite this interest, there seems to be very limited understanding of users' mind map. Essentially, a clear understanding of users' thoughts and feelings could help businesses better allocate funds appropriately to effective factors and redesign or eliminate non-effective factors. By being aware of how mental models impact users' understanding of SNSs can help businesses better apply marketing strategies that are consistent with users' expectations and behaviour in social media [8]. This study, therefore, sets out to explore the following research questions: what are the mental models of online users toward the value of social networking sites? This study aimed to obtain new insights towards social networking sites usage behavior. Based on participants' mental models, it is hoped to make more clear exposition about their perceptions and experiences as well as to explore what factors may have an impact on their behavior for using social networking sites. An interpretative approach by means of the Zaltman Metaphor Elicitation Technique (ZMET), a projective technique, was conducted to a University context.

2. The projective technique

The projective technique is a blend of three qualitative methodologies including the ZMET method, the laddering technique, and the means-end chain theory.

2.1. The Zaltman Metaphor Elicitation Technique

For understanding users' actual thoughts toward social networking sites, the projective technique, ZMET, was selected. The rationale for using ZMET to collect and analyze data is that the ZMET process of thinking about and searching for images is able to bring hidden, unconscious thoughts to the surface [9]. The ZMET method provides opportunity for researchers to look at the phenomena in more varied and deeper ways than is possible through other traditional qualitative methods.

Most qualitative research techniques, such as case study and focus groups, depend on verbal communication as a data-collection method. However, for more than 80% of people communication being nonverbal and non-linear [10], verbal-based interactions with subjects may result in an incomplete communication. Additionally, people decision-making and behavior are guided by largely hidden experiences because probably 95% of all cognition is unconscious [11]. Thus, the way in which thoughts occur may be very different from the way in which they are communicated. Cognitive scientists claim that people think in images, not words; however lots of today's qualitative research techniques rely on verbal-centric communication (i.e., literal, verbal language) as a data collection method [10, 12]. As subjects are better able to transmit their thoughts and feels in nonverbal terms, combining nonverbal images with verbal communication is able to generate a more meaningful message than totally relying on verbal communication. In this regard, ZMET was designed to be a more precise research tool which can make up the deficiencies in current qualitative research methods.

ZMET is a hybrid methodology, which integrates the visual projection technique, in-depth personal interview, and a range of qualitative data-coding method, such as categorization, abstraction of categories, and comparison of instances within data to elicit the metaphors, constructs, and mental models that drive consumers' thinking and behavior. For improving qualitative research, ZMET uses multidisciplinary ideas such as cognitive neuroscience, neurobiology, art critique, literary criticism, visual anthropology, visual sociology, the philosophy of mind, art therapy, and psycholinguistics to combine knowledge from the social sciences, biological sciences, and the humanities. Metaphors, photo analysis, and narrating are key concepts used in ZMET, and each adds value to this research process. This technique achieves high validity since issues and structures emerge from the data collected by the respondents themselves. Therefore, ZMET has been employed in numerous academic studies. In addition, it has gained considerable interest and been used in over 20 countries around the world by the world's leading companies, such as AT&T, Coca-Cola, Motorola, American Express, to explore consumer and organizational issues [9].

2.2. The Means-End Chain Theory and the Laddering Technique

The means-end theory sustains that the way participants relate to topics can be represented by a hierarchical model of three interconnected levels: attributes, consequences, and values [13-14].

The ZMET approach can offer a deeper and richer understanding of the important personal constructs elicited through laddering process [15]. The analysis of the means-end data comprised of three stages. At the first stage, the coding of sequences of attributes, consequences and values (the ladders) takes place in the results of ZMET process. The second stage involves the development of meaningful categories by grouping together phrases with identical meanings. The identification of categories is by A-C-V phrases and key words that participants used during the ZMET interviews and from concepts derived from the literature review. The study will follow an iterative process of recoding data, splitting, combining categories and generating new or dropping existing categories, followed by an aggregation of codes for individual means-end chains across participants. Finally, two hierarchical value maps (HVM) of teachers and students will be generated. The map consists of nodes, which stand for the most important attributes/consequences/values (conceptual meanings) and lines, which represent the linkages between the concepts. The map graphically sums up the information collected during the ZMET interviews.

3. Research Methodology

To address the research question, a qualitative research framework is presented in Fig. 1. In order to capture the mental of online users who were using social networking sites, a blend of qualitative methodologies including the ZMET method, means-end approach, and laddering process were used for data collection and analysis.

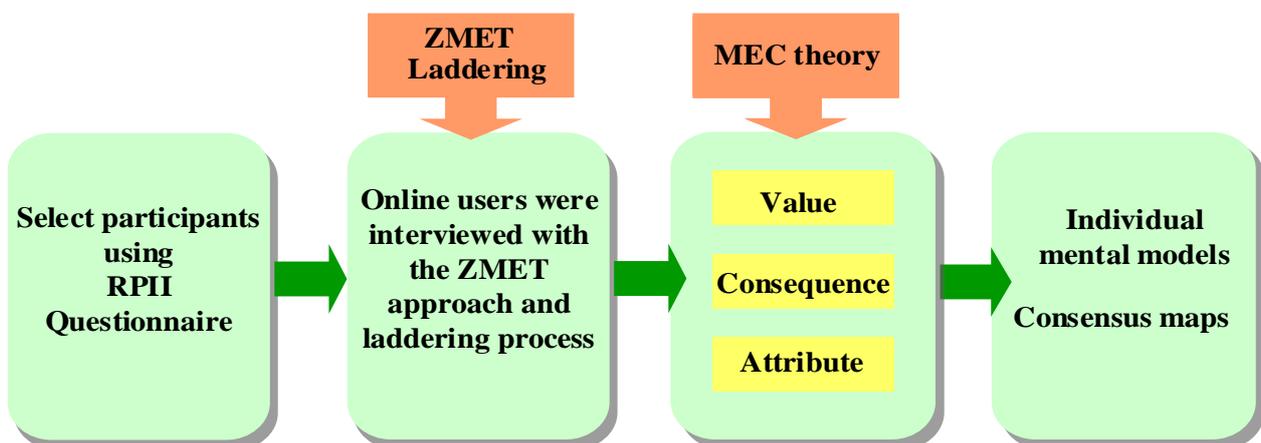


Fig. 1 Research framework

This study had the ZMET approach as theory basis, combining means-end approach and laddering process to analyze the high involvement people thoughts and feelings for SNSs usage. According to this method, we could realize the correlation about SNSs attributes, usage consequences, and ultimate values. Qualitative-based procedures were selected for this study for three reasons. First, this study seeks to deeply better understand what is actually happening within social networking sites. Second, it is hoped to obtain more in-depth information that may be difficult to convey quantitatively. Third, ZMET method provides opportunity for researchers to look at the phenomena in more varied and deeper ways than is possible through other traditional qualitative method.

3.1. Selecting Participants

In this study, the revised personal involvement inventory (RPII) questionnaire was utilized to help find a representative sample of Facebook users, who meet the requirements for the research objective and have a high relevance. The RPII is illustrated in Table 1. After qualifying for participation using RPII, a total of 12 Facebook users are recruited to participate in our study. For understanding users’ actual thoughts toward social networking sites, the projective technique, ZMET, was selected. The rationale for using ZMET to collect and analyze data is that the ZMET process of thinking about and searching for images is able to bring hidden, unconscious thoughts to the surface [9]. The ZMET method provides opportunity for researchers to look at the phenomena in more varied and deeper ways than is possible through other traditional qualitative methods. Twelfth qualitative interviews based around the ZMET approach were used for this study including 12 users who have highly participated in social networking sites were conducted.

Table 1 RPII- revised personal involvement inventory

1	Unimportant	.....	Important
2	Boring	.....	Interesting
3	Irrelevant	.....	Relevant
4	Unexciting	.....	Exciting
5	Means nothing	.....	Means a lot to me
6	Unappealing	.....	Appealing
7	Mundane	.....	Fascinating
8	Worthless	.....	Valuable
9	Uninvolving	.....	Involving
10	Need	.....	Not needed

Participants will be instructed to gather eight to ten pictures that represent their thoughts and feelings about social networking sites. These pictures could come from any source, including photographs, magazines, books, newspapers, or catalogues, and the instructions will be given seven to ten days prior to the interview. Participants were contacted one or two days before their interview to confirm their understanding of the task and the whole processes, and each interview took approximately two hours in a quiet room and were recorded.

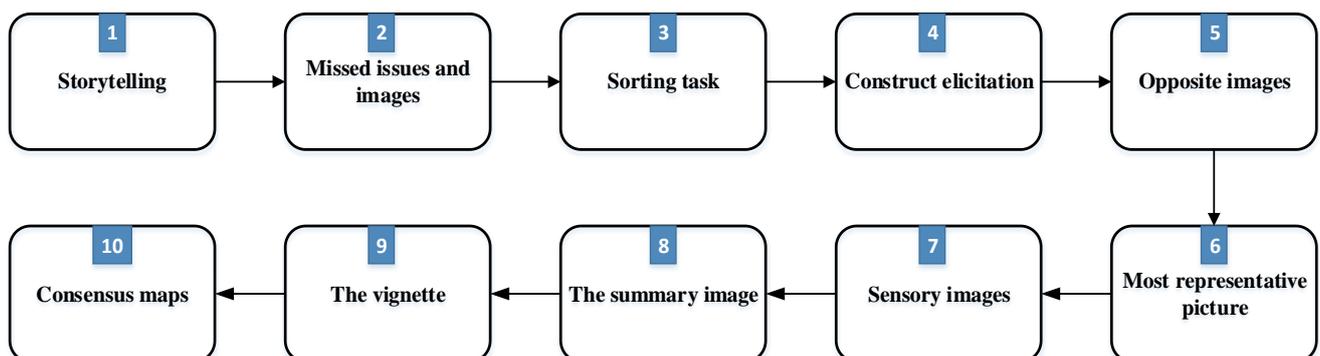


Fig. 2 The ten core steps in implementing ZMET

During the two-hour ZMET interview, ten steps in the ZMET method are summarized as follow and shown as Fig. 2.

- (1) Storytelling: Provides participants with an opportunity to tell their stories (as shown in Table 2) because human memory and communication is story-based.
- (2) Missed issues and images: Participants describe any issues for which they are unable to find a picture to obtain and explain their relevance.
- (3) Sorting task: Participants are asked to sort their pictures into meaningful piles.
- (4) Construct elicitation: The laddering technique is used to elicit basic constructs and their relationships. Participants' pictures serve as stimuli.
- (5) Opposite images: Respondent describes pictures that represent the opposite of the task.
- (6) Most representative picture: Participants indicate the picture that is most representative.
- (7) Sensory images: Descriptions are elicited of what does and does not describe the taste, touch, smell, sound, color, and emotion of the concept being explored.
- (8) The summary image: Respondent, with scissors used to cut photos, creates a summary image.
- (9) The vignette: Participant is asked to create a story or short imaginary video that communicates important issues related to the topic under consideration.
- (10) Consensus maps: All the respondents' mental maps were merged to a consensus map.

Table 2 Storytelling

Images	Briefly description	Image description
	Privacy	I do care about online privacy issues very much. There are various threats that people may encounter on social media. For avoiding dangers, great skills and caution are required for using social networking sites. Otherwise, it is easy to observe or monitor other users' emotional state and interactive statuses.
	Addiction	Similar to drug addiction, many users are addicted or obsessed with Facebook and have difficulty logging off even after they have been on for hours.
	Convenience	SNS is like a convenience store that is available 24 hours a day and offers everything from hot meals to package delivery. For example, Facebook is convenient because we can log into it anywhere, on a PC or on a Mobile Phone. It is helpful and convenient in ways that it helps users find friends, lets our current friends suggest some people we may know but have not already added.

3.2. Data Analysis

Participants' feelings, thoughts, and behaviors were analyzed based on means-end chain theory. All interviews were recorded and later transcribed to enable empirical content analysis for achieving means-end chains. Each means-end chain links the relationships between attributes, consequences, and values (A-C-V), it can also analyze the emotion product attributes brings to the consumers, what overall value thinking [16]. The link is shown in Fig. 3.

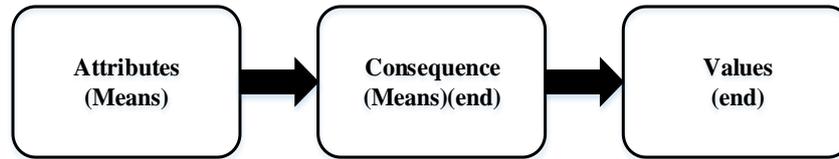


Fig. 3 Means-end chain connects relations between Attributes/Consequence/Values

A means-end chain links attributes of the social network sites, consequences of these attributes to participants, and the personal values that the consequences reinforce. Next, each participant’s transcripts were read to discover the relationships between attributes, consequences, and values. A participant’s sequence of attributes, consequences, and values (A-C-V) is called a means-end chain and represents a perceptual orientation of decision criteria. Finally, a series of A-C-V chains were merged together to derive individual mental models and the aggregate consensus maps of all participants.

A consensus map represents the main concepts identified by all participants and the linkages between the concepts as reflected in their interviews. The consensus map (see Fig. 4) in this study resulted from the linkages between system attributes, usage consequences, and personal values. This consensus map presented over 80% of all constructs mentioned by each one participant.

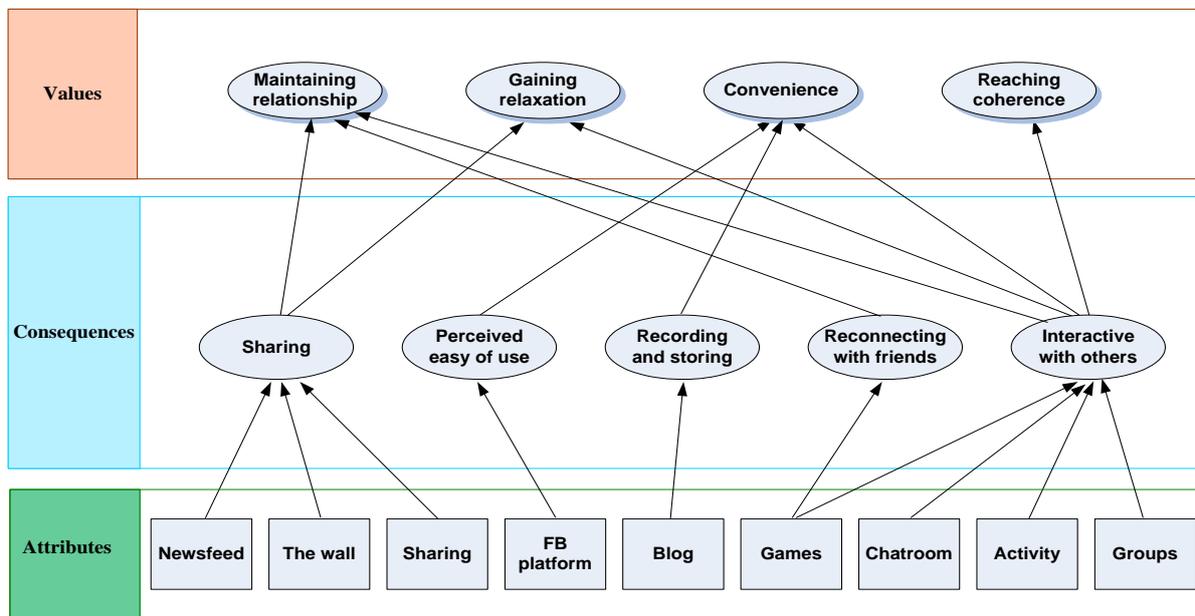


Fig. 4 The mental model towards social networking sites

4. Findings and Conclusions

The ZMET method provides a good way for understanding consumers’ cognition and projecting consumers’ behaviour. Therefore, research data were collected with the ZMET method to understand users’ insights toward using social networking sites more thoroughly and more deeply. The analytical results show that the majority of respondents in this study indicated the most important value of social networking sites includes its convenience, maintaining relationship, gaining relaxation, as well as reaching coherence. This study’s findings were consistent with previous research of social networking sites [17-19]. Additionally, respondents pointed out they cared about their online privacy issues very much and had found some potential dangers. However, they still continued to use social networking sites. The main reason is the perceived benefit and enjoyment providing by social networking sites are greater than perceived potential dangers for most respondents. The benefits of social networking service usage include formal educational outcomes, informal education and learning, creativity, individual identity and self-expression, strengthening social relationships, belonging and collective identity, building and strengthening communities, civic and political participation, self-efficacy and wellbeing.

References

- [1] Sean Casey, "The 2016 Nielsen social media report," <http://www.nielsen.com/us/en/insights/reports/2017/2016-nielsen-social-media-report.html>, 2017.
- [2] Pew Research Center, "79% of online adults (68% of all Americans) use Facebook," http://www.pewinternet.org/2016/11/11/social-media-update-2016/pi_2016-11-11_social-media-update_0-02/.
- [3] S. Jones and S. Fox, "Generations online in 2009," http://www.pewinternet.org//media//Files/Reports/2009/PIP_Generations_2009.pdf, 2009.
- [4] K. C. Laudon and J. P. Laudon, *Management information systems: managing the digital firm*, New Jersey: Prentice-Hall, 2012.
- [5] A. Lenhart, K. Purcell, A. Smith, and K. Zickuhr, "Social media and young adults," Washington, DC: Pew Internet and American Life Project, <http://pewinternet.org/Reports/2010/Social-Media-and-Young-Adults.aspx>, 2010.
- [6] The 2010 Nielsen Company report, "Global audience spends two hours more a month on social networks than last year," <http://blog.nielsen.com/nielsenwire/global/global-audience-spends-two-hours-more-a-month-on-social-networks-than-last-year/>, 2010.
- [7] J. Hahn, "Social networking ad spending to reach \$2.6 billion," <http://www.emarketer.com/Article.aspx?id=1006278/>.
- [8] P. Rydén, T. Ringberg, and R. Wilke, "An investigation of the mental models of social media in the minds of managers," the 43rd EMAC Annual Conf. 2014, 2014, pp. 1-9.
- [9] G. Zaltman and R. Coulter, "Seeing the voice of the customer: Metaphor based advertising research," *Journal of the Marketing Research Society*, vol. 35, no. 4, pp. 35-51, 1995.
- [10] G. Catchings-Castello, "The ZMET alternative," *Marketing Research*, vol. 12, no. 2, p. 6, 2000.
- [11] G. Zaltman, "Eliciting mental models through imagery 22," *The Languages of the Brain*, vol. 6, pp. 363, 2002.
- [12] A. G. Woodside, "Advancing means end chains by incorporating Heider's balance theory and Fournier's consumer-brand relationship typology," *Psychology & Marketing*, vol. 21, no. 4, pp. 279-294, March 2004.
- [13] M. Vriens and F. T. Hofstede, "Linking attributes, benefits, and consumer values," *Marketing Research*, vol. 12, no. 3, pp. 4-10, 2000.
- [14] R. B. Woodruff and S. Gardial, *Know your customer: New approaches to understanding customer value and satisfaction*. Wiley, 1996.
- [15] G. L. Christensen and J. C. Olson, "Mapping consumers' mental models with ZMET," *Psychology and Marketing*, vol. 19, no. 6, pp. 477-502, May 2002.
- [16] T. J. Reynolds and J. Gutman, "Laddering theory, method, analysis, and interpretation," *Journal of advertising research*, vol. 28, no. 1, pp. 11-31, March 1988.
- [17] D. Boyd and N. Ellison, "Social network sites: Definition, history, and scholarship," *Journal of Computer-Mediated Communication*, vol. 13, no. 4, pp. 210-230, 2007.
- [18] R. Junco, "The relationship between frequency of Facebook use, participation in Facebook activities, and student engagement," *Computers & Education*, vol. 58, no. 1, pp. 162-171, January 2012.
- [19] O. Kwon and Y. Wen, "An empirical study of the factors affecting social network service use," *Computers in Human Behavior*, vol. 26, no. 2, pp. 254-263, March 2010.