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Effects of technology readiness on prosumer attitude and eWOM

科技准备度对于专业型消费者态度和网络口碑的影响

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In today's technology-based market environment, consumers sometimes produce a product idea or innovation to use themselves in order to fulfill their needs. They are called "prosumers" (Toffler, 1980). According to the Diffusion of Innovation Theory, innovation is relevant to technological growth, and consumers who have a positive view of new technology have a tendency to be innovators (Rogers, 1995).

To what degree are consumers ready for new technology? We tried to use the concept of the Technology Readiness Index (TRI) to explain the antecedent factors of prosumer attitude and electronic word of mouth (eWOM). In this article, we attempt to conceptualize the prosumer, discover whether a consumer's positive or negative view of technology has an effect on attitudes related to becoming a prosumer, and show that prosumers' attitudes can be related to eWOM, which is one of the practical activities carried out by consumers in today's market environment.

The goals of this article, and how they will be achieved, are as follows: (i) to conceptualize the prosumer, the authors select constructs from previous literature studied by similar groups – such as opinion leaders, innovators, early adopters and DIY consumers (ii) – to investigate the effect of consumers' TRI on the prosumers' attitudes; (iii) to explain the effect of prosumers' attitudes on eWOM. In the conclusion to this study, the authors suggest managerial implications and future directions of study.

Keywords: technology readiness; TRI; prosumer; eWOM; word of mouth

在当今科技导向的市场环境下，消费者有时为了满足他们自己的需求而萌生一些产品概念和创新，这类消费者被称为"专业型消费者"(Toffler, 1980)。依据"创新分散理论"，创新与技术增长有关，积极对待新技术的消费者有变为创新者的潜在趋势(Rogers, 1995)。

消费者准备好接受新技术了吗？我们以科技准备指数去解释专业型消费者的先前态度因素和网络口碑。本文试图概念化专业化消费者，并将网络口碑（时下市场环境中消费者最常见的活动）与专业化消费者的态度联系起来。

本文主要目的在于：（1）概念化专业型消费者，作者依据前人文献作了意见领袖，创新者，早期使用者，自助消费者（2）作者强调了消费者科技准备指数对于专业型消费者态度的影响作用（3）作者谈久了专业型消费者的态度对于网络口碑的影响（4）本文结论中，作者作了总结并提出了未来的研究方向。

科技准备度

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以科技的矛盾为基础，Parasuraman (2000)提出了测量消费者对于科技准备度的一个范围。科技准备指数包含了采用这对于科技正负效应的观点和强弱的衡量。科技准备指数最初被国家科技准备调查用来做量化研究。科技准备指数包括了四方面的36个问题：10个关于乐观主义的问题，7个关于创新性的问题，10个关于不舒适的问题以及9个关于不安全问题。乐观和创新性是科技驱动力，不舒适和不安全是固守成规的力量

1) 乐观主义

科技的乐观主义者认为科技使我们能更好的控制我们的生活，现代科技使得我们的生活更加方便，比如电脑能使我们更有效的进行商业交流。另一方面，悲观主义者不太喜欢科技创新，他们对于新科技的接受滞后于乐观主义者

2) 创新性

创新性可被定义为一种尝试新鲜东西的趋势。特别的，创新性在科技领域意味着一种称为科技先驱和意见领袖的趋势(Parasuraman, 2000)。介于科技创新性和科技接受行为之前正向的联系，我们得出创新型消费者更容易接受新科技，并乐于学以致用。基于此特点，创新型消费者更有可能转变为创新者和早期使用者。

3) 不舒适

不舒适可被概括为缺乏对于科技的控制并产生一种屈服于之的感觉(Parasuraman, 2000)。换而言之，就是一种科技过于复杂的感觉，认为科技并不是常人之物，认为需要很多知识才能接受新科技而产生的一种不舒适感受。产生如上感受的消费者会对新科技产品持有怀疑态度。

4) 无安全感

无安全感则是对于科技的怀疑，并不相信它能胜任工作(Parasuraman, 2000)。无安全感的消费者对于新科技没有信心，他们需要反复检查。如某些产品变为自动化，他们则会怀疑该技术会在某致命关头时效。对于新科技缺乏安全感的消费者会延迟购买决策。

分析和实验模型

作者设立实证模型，并应用一个样本调查去验证。样本数据多达315个，作者利用了其中的307个数据，数据皆从个人处获得。依据被调查者的性别区分，55.4%的是男性，46.6%的为女性；依据被调查者的年龄区分，25.4%的是10–29，67.1%的是20–29，其余的为超过30及以上。为了验证测量数据的内容有效性，作者检验了探索因子分析法。主成分分析和and varimax rotation were used and the rotated factor loading was judged if it is over 0.5.

作者应用结构方程模型和AMOS程式来验证假设模型的有效性。总体而言，数据的拟合度是可接受的(e.g. GFI = 0.820, CFI = 0.884, RMSEA = 0.055)，如表7所示，多数实验假设均存在数据的显著性和可接受性。

管理意义

首先，目前的研究缺乏专业型消费者的研究，因此，专业型消费者的特点并未被量化出来。本文试图概念化专业型消费者并调查专业型消费者的四个潜在特点（以实证研究分析）。其次，多数关于科技准备指数的文章多关注与科技接受模型，但是本文创新性地提出了科技准备指数与专业型消费者的关联。最后，本文提出了科技准备指数最初的概念的维度需依据时下的市场改变做相应变化。

关键词：科技准备度; 科技准备指数; 专业型消费者; 网络口碑; 口碑营销

1. Introduction

Over the past decades, technological change has become the most important cause of market evolution (Sood & Tellis, 2005). Large technological changes, such as the Industrial Revolution and the information revolution, always lead to changes in the market environment. In the years

to come, technological development will gradually lead control of market evolution and the market environment to become turbulent. The increased knowledge provided to consumers is making their needs more diverse and suppliers are facing a fierce competitive landscape in the global market environment (Achrol, 1991). To survive in this environment and to fulfill consumers' needs, they must begin to take part in production activities (Juttner & Wehrh, 1994). Consumers' production activities have created an ambiguity between the producer and the consumer. Consumers sometimes themselves produce a product idea or innovation to use in order to fulfill their needs. Such consumers are known as " prosumers" (Toffler, 1980).

Not all consumers are prosumers. According to the Diffusion of Innovation Theory, innovation is relevant to technological growth, and consumers who have a positive view of new technology have a tendency to be innovators (Rogers, 1995).

Despite prosumers' great contribution to the "invisible economy", since the word was introduced more than 30 years ago, only a few studies have focused on the importance of the "prosumer" concept and its difference from the concept of the traditional consumer (Toffler & Toffler, 2006; Konczal, 2008). There is a lack of theoretical conceptualization of the term.

What is a prosumer? What are their characteristics? To find out the answers to these questions, the authors suggest that Toffler's (1980) concept of the prosumer is related to previous literature describing similar concepts and propose that the prosumer can be conceptualized by common factors. This can be a starting point for prosumer studies.

With these constructs regarding prosumers, the authors propose that consumers' beliefs related to technology can affect the attitudes of the prosumer, and these attitudes can have an effect on electronic word of mouth (eWOM) intentions. To measure these constructs, the authors use scales from previous studies, such as Parasuraman (2000)'s Technology Readiness Index (TRI). In this article, the authors attempt to conceptualize the prosumer, discover whether a consumer's positive or negative view of technology has an effect on attitudes in relation to becoming a prosumer, and show that prosumers' attitudes can be related to eWOM, which is a practical activity that can be carried out by the consumer.

The goals of this article are as follows: (i) To conceptualize the prosumer, the authors select constructs from previous literature studied by similar groups, such as opinion leaders, innovators, early adopters and DIY consumers. (ii) The authors demonstrate the effect of consumers' TRI on prosumers' attitudes; (iii) the authors show the effect of prosumers' attitudes on eWOM. (iv) In the conclusion of this study, the authors suggest managerial implications and the direction of future research, and note the limitations of this study.

2. Theoretical background

2.1 Change of market environment and technology

Markets and business environments have changed rapidly. Huber (1984) asserts that these environmental causes increase three factors: diversity, knowledge, and turbulence. In addition, with these changes, distinct local markets are merging into a huge "global market". Texchnology diffusion can be seen as the most important cause of these market changes (Sood & Tellis, 2005). Specifically, developments in transportation and telecommunication should be highlighted because of their effects on radical market changes (Archrol, 1991; Berthon et al., 2000). Similarly, Berthon et al. (2000) describe market evolution as technology development with customer's and producer's market power.

Thus, the market is changing continuously. The development of technology is the driving force of this change. Market changes stemming from new technology stimulate customers to participate in production activities.

Table 1. A typology of market evolution.

Producer market power \ Customer market power	Low	High
Low	(1) Benign co-existence	(3) Customer supremacy in the service economy
High	(2) Industrial revolution toward production economy	(4) Strong interaction via the emerging information paradigm

Source: Berthon et al. (2000).

2.2 Technology and the Technology Readiness Index (TRI)

Studies of technology are vast in number and cover numerous dimensions (Mick & Fournier, 1998). They have also been carried out in relation to consumer behavior. Rogers (1995) explains that there are five kinds of adopter groups in new technology acceptance: innovators, early adopters, early majority, late majority, and laggards. Social, economic, personal, and communicative factors affect consumers' characteristics in relation to technology acceptance. Paradoxes of technology are also worthy of mention, for the reason that people show different views of technology acceptance. Even though there have been many studies of technology, negative opinions and positive opinions of technology coexist. Some researchers insist that technology itself is paradoxical (Goodman, 1998). As seen in Table 2, Mick and Fournier (1988) divide paradoxes of technology into eight categories.

On the basis of the paradoxes of technology, Parasuraman (2000) developed a scale which measures consumers' readiness for technology. The Technology Readiness Index (TRI) notes that adopters' views of technology can be both positive and negative

Table 2. Eight central paradoxes of technological products.

Paradox	Description
Control/Chaos	Technology can facilitate regulation or order, and technology can lead to upheaval or disorder.
Freedom/Enslavement	Technology can facilitate independence or fewer restrictions, and technology can lead to dependence or more restrictions.
New/Obsolete	New technologies provide the users with the most recently developed benefits of scientific knowledge, and new technologies are already or soon to be outmoded as they reach the marketplace.
Competence/Incompetence	Technology can facilitate feelings of intelligence or efficacy, and technology can lead to feelings of ignorance or ineptitude.
Efficiency/Inefficiency	Technology can facilitate less effort or time spent in certain activities, and technology can lead to more effort or time in certain activities.
Fulfills/Creates Needs	Technology can facilitate the fulfillment of needs or desires, and technology can lead to the development or awareness of needs or desires previously unrealized.
Assimilation/Isolation	Technology can facilitate human togetherness, and technology can lead to human separation.
Engaging/Disengaging	Technology can facilitate involvement, flow, or activity, and technology can lead to disconnection, disruption, or passivity.

Source: Mick & Fournier (1988).

and measures which side is stronger. TRI was developed from initial qualitative research to the NTRS (National Technology Readiness Survey). TRI consists of four dimensions over 36 questions: 10 questions related to optimism, seven questions related to innovativeness, 10 questions related to discomfort, and nine questions related to insecurity. Optimism and innovativeness are drivers of technology, and discomfort and insecurity are inhibitors.

2.2.1 Optimism

Optimism, in this regard, is "a positive view of technology and a belief that it offers people increased control, flexibility and efficiency in their lives" (Parasuraman, 2000). Technology optimists believe that technology gives more one control over life, that modern technology is more convenient, that computers extend hours of commerce, that dealing with computers is easier than dealing with people and that technology increases efficiency (Colby & Thibodeaux, 2000). On the other hand, technology pessimists by nature dislike new innovations and accept new technological products more slowly than optimists (Rogers, 1995).

2.2.2 Innovativeness

Innovativeness can be defined as a tendency to like trying out new things (Hirschman, 1980). Specifically, innovativeness in the area of technology means "a tendency to be a technology pioneer and thought leader" (Parasuraman, 2000). As a positive relationship exists between innovativeness connected to technology and technology acceptance behavior, innovative consumers prefer to accept new technology and like to apply their knowledge to technology-based products (Lam et al., 2008). On the basis of these facts, it can be said that innovative consumers have more options to become innovators or early adopters.

2.2.3 Discomfort

Discomfort, in this context, is "a perceived lack of control over technology and a feeling of being overwhelmed by it" (Parasuraman, 2000). In other words, the feeling that technology is too complicated and the belief that technology is not for ordinary folks are included in the concept of discomfort (Colby & Thibodeaux, 2000). Consumers' discomfort with accepting technology causes hesitation in purchasing technological products.

2.2.4 Insecurity

Insecurity, in this context, means "[d]istrust of technology and skepticism about its ability to work properly" (Parasuraman, 2000). Consumers lack confidence in the product and feel the need to check carefully for mistakes having been made. Whenever something becomes automated, they worry that the technology will fail at the worst possible time (Colby & Thibodeaux, 2000). For instance, the population of those using e-commerce can be mentioned in this context. These consumers fear that technology cannot control personal information exposure (Poel & Leunis, 1999) and are disturbed by the fact e-commerce includes no human touch (Jasper & Ouellette, 1994). Consumers feeling insecurity in relation to technology can hesitate in their acceptance of new technology; thus, discomfort works as an inhibitor.

3. Conceptualization of the prosumer

The term "prosumer" was coined by Alvin Toffler in the 1980 book *The Third Wave* (Toffler, 1980), in which he introduced the term by combining the words "producer" and "consumer". He predicted that the roles of producers and consumers would begin to blur and merge. Prosumers produce something not for sale and exchange, but for use and satisfaction. This is different from the notion of self-sufficiency, however, because of the goal. In addition, (Toffler & Toffler (2006) highlight that prosumers' production comprises a considerable component of the whole monetary economy, acting as an "invisible economy."

The development of information technology facilitates consumers to become prosumers. Consumers armed with information and knowledge can search for products to meet their needs more easily. Specifically, with the increased prevalence of the Internet, people can receive and share useful information with little effort. As this information sharing is free, interaction among producers and consumers becomes stronger, and the boundary between each becomes less distinct (Hoffman & Novak, 1996). The variation in consumers' needs is increasing, and producers' efforts to meet these needs are limited in success. To overcome this gap, consumers, armed with information and knowledge, are becoming prosumers.

There is a lack of literature on prosumer research. Only a few articles mention the prosumer as an important concept and stress its dissimilar characteristics to those of typical consumers (Schwarzer et al., 1997; Konczal, 2008; Toffler, 1980; Toffler & Toffler, 2006), although there is no academic research to conceptualize the concept. Therefore, these authors will now try to conceptualise the prosumer through Toffler's prosumer concept and similar groups described in existing articles about prosumers. The similar groups upon which the authors focus include innovators, early adopters, market mavens, opinion leaders, innovative UCC users, and do-it-yourself (DIY) consumers, and the following factors are extracted as variables of the prosumer's attitude.

3.1 Individuation

Individuation has been studied in relation to concepts such as acting differently from others and self- awareness (Maslach et al., 1985). Its antonym is "deindividuation." Thus, "individuation is a state in which the person feels differentiated, to some degree, from other people and object, on the other hand, deindividuation is a state in which the person feels indistinguishable, to some degree, from other people and objects" (Maslach et al., 1985, p. 731). Maslach et al. (1985) suggested there are two kinds of dimensions to individuation: private and public. Private individuation means that while people's awareness is different, special, or unique, they do not care whether or not this is apparent to others. Public individuation means that people's differences can be seen and evaluated by others (Maslach et al., 1985). This article focuses on public individuation , which has been studied as a characteristic of opinion leaders (Chan & Misra, 1990).

3.2 Self-efficacy

Self-efficacy corresponds to people's attitudes regarding how well they think they can perform on a task (Gist & Mitchell, 1992). People with high self-efficacy have a strong belief in their ability to achieve their goals (Bandura, 1977) and think that they hold the key to solving problems in a given situation (Bandura, 1993). In this sense, they can be seen as individualists who place themselves at the center of psychological focus

(Hui & Triandis, 1986). Many articles have been written concerning individualism as opposed to collectivism. Individualists usually do not care much for their influence on others and act on their feelings (Bontempo et al., 1990). For this reason, previous research reports that self-efficacy has a negative effect on organizational commitment (Riggs & Knight, 1994). Therefore, people with high self-efficacy show less concern, sharing, and so on than others might.

3.3 DIY

As DIY is an abbreviation of "Do-It-Yourself," it can be seen that it means consumers' creation of practical things themselves. Toffler and Toffler (2006) quantified the size of the DIY industry by country. As an example, the US home improvement products market makes 200 billion US dollars annually. In Britain, DIY-related television programs such as *Changing Rooms* and *Ground Force* account for high ratings for the British Broadcasting Corporation (BBC), and *Home and Garden TV* (HGTV) and the *DIY Network Channel* are watched in 29 countries, including the US, Japan, Australia, Thailand, Hungary, and the Czech Republic (Toffler & Toffler, 2006).

Williams (2004) suggests that reasons for DIY activity include pleasure, individualization, ease, or economic reasons, saying that high-income people tend to do DIY for reasons of pleasure, individualization, and ease, whereas low-income people tend to do DIY for economic reasons.

3.4 Participation

In relation to consumer behavior, participation means a consumer's mental or physical effort (Solomon et al., 1985). Consumers often participate on their own and, through this activity, play an important role in the production and delivery of services (Cermak et al., 1994). Also, from producers' point of view, consumers' participation in production activities is positive, attracting customers (Mills & Morris, 1986). A number of studies on consumer participation have focused on the position of producers (Cermak et al., 1994; Bettencourt, 1997, Bendapodi & Leone, 2003); fewer have focused on the position of consumers (Youngdahl & Kellogg, 1997). Based on this literature, the authors propose that consumers using products or services want to participate in the production activity to get better service and avoid service-failure, and participation is one of the attitudes taken up by prosumers.

4. Word of mouth (WOM) and electronic word of mouth (eWOM)

Word of mouth (WOM) means oral communication involving the passing of information from person to person. This process plays an important role in shaping consumers' attitudes and behaviors (Brown & Reingen, 1987). It has been found to be seven times more effective than newspaper and magazine advertising, four times more effective than personal selling, and twice as effective as radio advertising in influencing consumers to switch brands (Katz & Lazarsfeld, 1955).

Various factors affecting WOM have been studied. Engel et al. (1969) suggested that innovative consumers are active in WOM. Bansal and Voyer (2000) and Brown and Reingen (1987) asserted that personal tie strength and homophily between senders and receivers of WOM affect intention to provide and receive WOM. Betterncourt (1997) posited that WOM is one of consumer participation.

The internet has given people new ways to communicate with friends and access the world's information. Electronic word-of-mouth (eWOM) based in the online environment has some characteristics noticeably different from those of WOM. For this reason, eWOM has been studied as a concept different from typical WOM (Henning-Thurau et al., 2004, Brown et al., 2007, Li et al., 2010, Yoon & Han, 2012). The remarkable characteristics are as follows: (1) eWOM can overcome limitations of time and distance; (2) eWOM can deliver information to multiple recipients simultaneously; (3) eWOM is easier and more comfortable than WOM because of anonymity; (4) the reliability of eWOM is lower than that of WOM because of anonymity; (5) eWOM can be stored in text form and cannot be made to disappear.

5. Research hypotheses and study model

Based on the paradoxes of technology, people can be placed along a hypothetical technology-beliefs continuum anchored by "strongly positive" at one end and "strongly negative" at the other (Parasuraman, 2000). A positive or negative approach to technology can affect technology adoption. Rogers (1995) proposes that early adopters are more favorable to innovation than late adopters. Innovation can include new technologies, so it can be said that early adopters are more favorable to technology (Rogers, 1995). The authors suggest that prosumers are innovative, creative, or initiative-driven consumers, and suggest that technology readiness affects prosumers' attitudes.

Consumers that have a high TRI score are assumed to be early adopters of technology and an opinion leader (Rogers, 1995). Some studies say that individuation is a construct of opinion leaders (Maslach et al., 1985; Chan & Misra, 1990). Therefore, the authors advance the hypothesis that TRI affects individuation.

People who have high self-efficacy and who believe they control their future themselves are likely to be favorable to innovation (Bandura, 1997). If new technology can be included in the category of innovation, belief in technology can be related to consumers' self-efficacy. Therefore, the authors advance the hypothesis that TRI affects self-efficacy.

Personal intention to pursue or make something new is one of the motivations of DIY activities (Williams, 2008). The desire to seek new things can be related to willingness to adopt new technology. Therefore, the authors advance the hypothesis that TRI affects DIY.

The connection between consumer participation and technology readiness is suggested in Rogers' book *Diffusion of Innovations* (1995). Rogers said that people who recognize innovations early have a stronger tendency toward social participation than others. Coleman et al. (1966) found that doctors who are apt to adopt new medicine use show a tendency to participate in conferences far away from their offices (Coleman et al., 1966). For these reasons, consumers with a positive view of technology will adopt new technology, and have a tendency to participate in related events. Unsurprisingly, consumers who score highly on technology readiness can have a positive attitude about participation.

Based on the findings described above, the authors developed the following hypotheses regarding the effects of technology readiness on prosumer attitude:

H1: *Consumers' technology readiness affects prosumers' attitude.*

H1–1: *Consumers' technology readiness affects individuation.*
H1–1a: *Optimism has a positive effect on individuation.*
H1–1b: *Innovativeness has a positive effect on individuation.*

H1–1c: *Discomfort has a negative effect on individuation.*
H1–1d: *Insecurity has a negative effect on individuation.*

H1–2: *Consumers' technology readiness affects self-efficacy.*
H1–2a: *Optimism has a positive effect on self-efficacy.*
H1–2b: *Innovativeness has a positive effect on self-efficacy.*
H1–2c: *Discomfort has a negative effect on self-efficacy.*
H1–2d: *Insecurity has a negative effect on self-efficacy.*

H1–3: *Consumers' technology readiness affects DIY.*
H1–3a: *Optimism has a positive effect on DIY.*
H1–3b: *Innovativeness has a positive effect on DIY.*
H1–3c: *Discomfort has a negative effect on DIY.*
H1–3d: *Insecurity has a negative effect on DIY.*

H1–4: *Consumers' technology readiness affects consumer participation.*
H1–4a: *Optimism has a positive effect on consumer participation.*
H1–4b: *Innovativeness has a positive effect on consumer participation.*
H1–4c: *Discomfort has a negative effect on consumer participation.*
H1–4d: *Insecurity has a negative effect on consumer participation.*

Individuation is studied as a characteristic of opinion leaders (Chan & Misra, 1990), and active informers in the internet environment have a stronger opinion share than inactive informers (Kim, 2005). Therefore, the authors advance the hypothesis that individuation affects eWOM.

Self-efficacy is a feeling of strong self-confidence and self-trust. People who have strong self-efficacy think that they have the ability to solve problems by themselves (Bandura, 1993). In this sense they seem to be individualists who put themselves at the center of the psychological focus (Hui & Triandis, 1986). Taking a contrary view, Choi & Park (2001) assert that self-efficacy affects dependence on WOM information; however, this article defined self-efficacy as an "ability to perform the goal, WOM data search" (p. 59). This definition is far from the general concept of self-efficacy (a feeling of strong self-trust). In this article, people with strong self-efficacy seem to be individualist. Some studies say that self-efficacy has a negative effect on organizational commitment (Riggs & Knight, 1994). For these reasons, the authors advance the hypothesis that self-efficacy affects eWOM.

Williams (2008) suggests that one motivation for DIY activity is people's desire to show their family their own work. There are a number of private web pages on the internet presenting the page owner's work, such as crafts, cooking, recipes, and manuals for use of unusual tools, voluntarily. This can be regarded as a kind of eWOM activity. Therefore, the authors propose the hypothesis that DIY affects eWOM.

Consumer participation can be defined as consumers' desire to make an effort voluntarily, and this participation can be measured though the intention to present individual thoughts (Bettencourt, 1997). People who have a strong consumer participation tendency are going to present their own view or thinking to others. Therefore, the authors advance the hypothesis that consumer participation affects eWOM.

H2: *Prosumers' attitudes affect eWOM.*
H2–1: *Indiviudation has a positive effect on eWOM.*

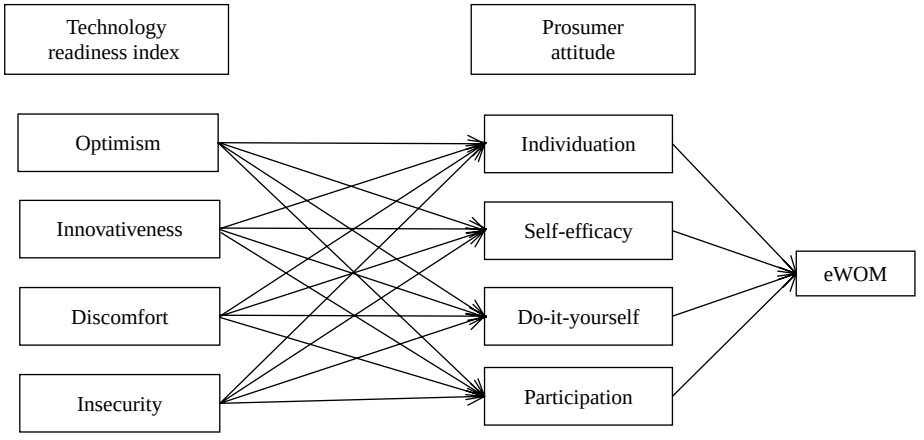

Figure 1. Study model of technology readiness and prosumer attitude on eWOM.

H2–2: *Self-efficacy has a negative effect on eWOM.*
H2–3: *DIY has a positive effect on eWOM.*
H2–4: *Consumer participation has a positive effect on eWOM.*

Based on the research hypotheses, we developed the hypothetical study model shown in Figure 1.

6. Methodology

6.1 Study setting and operationalization

The technology readiness construct is defined as "people's propensity to embrace and use new technologies for accomplishing goals in home life and at work" (Parasuraman, 2000). Technology readiness is constructed by two drivers, optimism and innovativeness, and two inhibitors, discomfort and insecurity.

In this article, the authors define optimism as a belief that offers people increased control, flexibility, and efficiency in daily life. Based on Parasuraman (2000)'s article, it is measured with 10 questions presented using a seven-point Likert item. Innovativeness is defined as a tendency to act as a technology pioneer and thought leader (Parausraman, 2000) and is measured with seven questions presented using a seven-point Likert item. Discomfort is defined as a perceived lack of control over technology and a feeling of being overwhelmed by it (Parausraman, 2000) and measured with 10 questions presented using a seven-point Likert item. Insecurity is defined as distrust of technology and skepticism about its ability to work properly (Parasuraman, 2000). It is measured with nine questions presented using a seven-point Likert item.

In this article, the prosumer's attitude is defined as the desire to be a consumer who produces products, services, and information to achieve their own purpose and satisfaction. Individuation is defined as a person's desire to be seen and evaluated by others. The authors modify Maslach et al.'s (1985) scale to fit the prosumer's attitude and measure it with seven questions presented using a seven-point Likert item. Self-efficacy is defined as the self-perception of being able to do something properly. For this, the authors modify Schwarzer et al.'s (1997) scale to fit the prosumer's attitude and measure it with four questions presented using a seven-point Likert item. Consumer participation is

defined as the desire to make an effort voluntarily. The authors take their cue from Bettencourt (1997), modifying the scale to fit the prosumer's attitude and measure it with five questions presented using a seven-pint Likert item.

In this article, electronic word-of-mouth intention is defined as an intention to communicate their own opinion or a review to others. Most studies measure eWOM as the intention of providing one's opinion in online space (Harrison-Walker, 2001). In this study, eWOM intention is measured with three questions presented using a seven-point Likert item.

7. Analysis of the model

In this study, the authors set out a theoretical model and conducted a sample survey to prove it correct. Because feelings about technology and prosumers' attitudes did not need to be limited to specific people, the authors did not limit the sample to specific groups. Before a sample survey, 35 college students and business people were tested to correct ambiguous or even erroneous expressions of questions. The authors tested Exploratory Factor Analysis (EFA) and reliability with Cronbach's alpha, then tested Confirmatory Factor Analysis (CFA) and Structural Equation Model (SEM). Based on this process, authors verified the validity, reliability, and propriety of the model building.

Data from a total of 315 surveys were gathered; data from 307 surveys were used in the final analysis. The authors investigated and gathered data in person. Regarding the characteristics of the respondents, 55.4% of the sample were male and 44.6% female. Regarding age groups, 25.4% of respondents were teenage, 67.1% were in their 20s, and 5.7% were over 30. To prove the content validity of measured factors, the authors tested EFA. Principal component analysis and varimax rotation were used and the rotated factor loading was judged if it was over 0.5.

Table 3. Result of factor analysis of TRI.

		Component			
Dimensions	Questions	1	2	3	4
Innovativeness	TRI_INN_07	.798	−.050	.029	−.110
	TRI_INN_01	.771	.076	.150	.004
	TRI_INN_03	.741	−.060	.207	.057
	TRI_INN_04	.739	−.093	−.054	−.080
	TRI_INN_05	.712	.050	.101	−.126
	TRI_INN_06	.696	−.060	.440	−.006
Insecurity	TRI_INS_02	−.079	.846	.014	.136
	TRI_INS_01	−.088	.780	−.013	.153
	TRI_INS_03	−.092	.748	.060	.178
	TRI_INS_05	.135	.628	.007	−.064
Optimism	TRI_OPT_07	.119	−.069	.838	.035
	TRI_OPT_08	.077	.056	.747	−.143
	TRI_OPT_09	.266	.100	.704	−.178
Discomfort	TRI_DIS_03	−.213	.064	.016	.786
	TRI_DIS_01	−.123	−.042	−.108	.705
	TRI_DIS_02	.133	.126	−.148	.638
	TRI_DIS_04	−.018	.278	−.020	.589
	Eigen Value	3.529	2.421	2.068	2.038
	% of Variance	20.758	14.244	12.162	11.988
	% Cum	20.758	35.002	47.164	59.152

Table 4. Result of factor analysis of prosumer attitude.

Dimensions	Questions	Component 1	2	3	4
Individuation	PRO_IND_03	.847	.054	.100	.145
	PRO_IND_01	.825	.104	.130	.093
	PRO_IND_02	.799	.157	.006	.015
	PRO_IND_07	.695	.186	−.123	.171
	PRO_IND_05	.683	.006	.221	.305
	PRO_IND_04	.656	.274	−.019	.165
	PRO_IND_06	.550	.093	.055	.138
Consumer Participation	PRO_PAR_03	.202	.829	.060	.022
	PRO_PAR_02	.281	.821	.105	.070
	PRO_PAR_01	.197	.816	.072	.069
	PRO_PAR_04	.106	.775	.057	.081
	PRO_PAR_05	−.033	.721	.110	.094
DIY	PRO_DIY_03	.019	.139	.911	.070
	PRO_DIY_04	.088	.094	.882	.068
	PRO_DIY_01	.083	.093	.750	.188
Self-efficacy	PRO_EFF_02	.215	.055	.105	.830
	PRO_EFF_03	.279	.097	.043	.820
	PRO_EFF_01	.157	.134	.200	.752
	Eigen Value	4.052	3.369	2.352	2.195
	% of Variance	22.513	18.719	13.069	12.197
	% Cum	22.513	41.232	54.301	66.498

Table 5. Results of reliability analysis.

Variable		# of questions	Cronbach's alpha
TRI	Optimism	3	0.713
	Innovativeness	6	0.855
	Discomfort	4	0.649
	Insecurity	4	0.765
Prosumer's attitude	Individuation	7	0.871
	Self-efficacy	3	0.800
	DIY	3	0.836
	Consumer participation	5	0.870
eWOM		3	0.874

Table 6. Confirmatory factor analysis of TRI and prosumer attitude.

	GFI	CFI	RMSEA
Technology Readiness Index	0.900	0.891	0.071
Prosumer attitude	0.889	0.940	0.061

To prove internal consistency of measured constructs, Cronbach's alpha was used; all factors met the criterion.

To indicate construct validity and convergent validity, the authors tested CFA. The results of this test show that the model fit is acceptable.

Table 7. Final results of hypotheses testing.

H	Causal Path	Estimate	S.E.	C.R. (t-value)	P	Acceptance
1–1a	Optimism->Individuation	0.282	0.138	2.043	0.041	O
1–1b	Inn.->Individuation	0.252	0.116	2.163	0.031	O
1–1c	Discomfort->Individuation	−0.004	0.157	−0.026	0.980	X
1–1d	Insecurity->Individuation	−0.033	0.097	−0.339	0.735	X
1–2a	Optimism->Self-efficacy	0.206	0.081	2.536	0.011	O
1–2b	Inn.->Self-efficacy	0.164	0.068	2.415	0.016	O
1–2c	Discomfort->Self-efficacy	0.001	0.091	0.008	0.994	X
1–2d	Insecurity->Self-efficacy	0.115	0.101	1.139	0.255	X
1–3a	Optimism ->DIY	0.098	0.083	1.185	0.236	X
1–3b	Inn.->DIY	0.227	0.073	3.097	0.002	O
1–3c	Discomfort->DIY	0.071	0.096	0.739	0.460	X
1–3d	Insecurity->DIY	0.006	0.105	0.062	0.950	X
1–4a	Optimism ->Participation	0.318	0.089	3.579	0.000	O
1–4b	Inn.->Participation	0.214	0.073	2.935	0.003	O
1–4c	Discomfort->Participation	−0.033	0.097	−0.339	0.735	X
1–4d	Insecurity->Participation	0.079	0.107	0.740	0.459	X
2–1	Individuation->eWOM	0.194	0.065	2.958	0.003	O
2–2	Self-efficacy->eWOM	−0.249	0.123	−2.016	0.044	O
2–3	DIY->eWOM	0.292	0.103	2.827	0.005	O
2–4	Participation->eWOM	0.323	0.102	3.170	0.002	O

8. Study results

The research hypotheses and the study model were tested by using structural equation modeling and AMOS program. Overall, the goodness-of-fit indices were acceptable (e.g. GFI = 0.820, CFI = 0.884, RMSEA = 0.055) and, as seen in Table 7, many of the research hypotheses were statistically significant and accepted. However, it was interesting that, among the four underlying factors of Technology Readiness, inhibitors (i.e. Discomfort and Insecurity) were not shown to be significant factors of our research model.

9. Managerial implications and direction for future research

The goal of the article was to conceptualize the prosumer, describe the effect of consumers' technology readiness on the attitude of the prosumer, and describe the effect of the prosumer's attitude on electronic word of mouth. To clarify this sense, authors conceptualized the prosumer through the use of previous literature and tested the relationship among factors with an empirical analysis. The results are as follows.

First, drivers of TRI, optimism and innovativeness have a significant effect on prosumer attitude. Optimism affects most aspects of prosumer attitude, including individuation, self-efficacy, and consumer participation; the exception was DIY. Optimism, in this context, is a positive view of technology and a belief that it offers people increased control, flexibility, and efficiency in their lives (Parasuraman, 2000). People want to make things themselves when they think the current situation is not efficient and comfortable, and needs to be controlled. For this reason, optimism cannot always be an effective cause of DIY. Also, economic reasons can motivate DIY (Williams, 2008).

On innovativeness, which is a driver of TRI, all factors of the prosumer's attitude are affected. Innovative consumers have strong self-belief and self-trust, and believe that they can solve problems by themselves. They are willing to create something to fulfill their needs and try to fix what is wrong in others' products.

Secondly, inhibitors of TRI – discomfort and insecurity – do not have significant effects on creating the prosumer's attitude in this study. The reasons why these hypotheses are not supported may be as follows. First the concept of TRI was developed, a decade ago, and consumers' awareness of technology has changed greatly. For instance, the Automated Teller Machine (ATM) was a new technology in banking service many years ago (Parasuraman, 2000). At that time, consumers were not familiar with this self-service technology (SST): most service occurred between person and person, not person and machine. Nowadays, people experience many new technologies which consist of no interaction between person and person. As interaction between person and technology comes to be routine, people may not find themselves discomforted or made insecure by technology.

The limitation of samples should be mentioned. In this study, most participants were in their teens or 20s, and the sample included many college students. This may skew the results of the study, because gender, age, education, and expertise can significantly affect technology acceptance (Rogers, 1995). Because those in their teens and 20s were born and raised in "the information technology age', they have been frequently exposed to technology. Such experience of technology cannot be overlooked (Rogers, 1995). Finally, it can be mentioned that Koreans have a positive tendency of technology and prefer high-tech, brand-new, complicated information devices based on high technology. A cross-cultural study of mobile phone users suggested that UK users think Korean mobile phones are too complicated to use, while Korean users think UK mobile phones are too simple to use (Cha et al., 2005).

Third, this article shows that the prosumer's attitude affects eWOM, which is the act of producing information. All those four dimensions of prosumer attitude were shown to influence eWOM.

The managerial implications of this study are as follows.

First, there is a lack of studies of the prosumer, and for this reason, prosumers' characteristics have never been analyzed with quantitative scales. This article tries to conceptualize the meaning of the prosumer and investigate the four underlying dimensions of prosumer characteristics based on empirical analysis. Second, most articles related to TRI have been studied within the boundary of the Technology Acceptance Model (TAM; Davis, 1989), but this paper tried to extend the area of TRI research to the new era and relate it to prosumers. Third, the authors suggest that the original concept and major dimensions of TRI need to be reconsidered according to current market changes. In a rapidly changing market environment, technology adopters are changing too; therefore, the scale of measurement for technology belief needs to be changed.

This article has several limitations, which are as follows.

First, not only the measured variables, but also other significant variables, can exist and affect the prosumer's attitude. This article tested only four factors, but we could consider creativity, self-service, involvement, or propagation as some other possible factors in a prosumer's attitude. In future studies, authors may need to add other variables.

Second, the problem of sample representativeness samples can be suggested. The sample in this study is skewed toward those in their teens and 20s, who are relatively technology-friendly. The regional specificity of Korea may also affect the result. In the future, a cross-cultural comparative study of technology adopters will be needed to investigate the influence of TRI on prosumer attitude and eWOM.

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