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User Resistance to Digital Goods: a Case of E-books

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User Resistance to Digital Goods: a Case of E-books

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Abstract

Technology adoption has long been studied on the information systems field. On the contrary, why people do not adopt a new technology has not been focused. Focusing solely on the enabling factors, important additional perceptions possibly have missed. This research adopt the concept of resistance to change to explain the peoples' adoption behavior. Combined with theory of planned behavior and functional/psychological barriers that causes resistance, this study suggests a theoretical framework that can explain adoption behavior from another viewpoint. The model is validated by partial least square techniques. The barriers causes resistance to change and users with higher resistance to change have less intention to use. However, although subjective norm and self-efficacy from TPB have positive effect on intention to use, resistance to change does not mediate the relationships among them. This research expand the understanding of adoption behavior by examining inhibiting factors. The findings provide insights to the digital product providers, especially e-book publishers explaining why digital products fail in the marketplace.

Keywords: Resistance to Change, E-book, Theory of Planned Behavior, Usage Barrier, Psychological Barrier

1. Introduction

Technology adoption and diffusion has long been investigated on the Information systems and information technology (IS/IT) field (Venkatesh et al., 2007). Studies from the field have investigated different systems and technologies in the different contexts from individual level

to societal level using a wide range of techniques including Technology Acceptance Model (TAM) and Diffusion of Innovation (DoI) theory (Joshi, 2005; Williams et al., 2009). Researchers have tried to discover the relationships among beliefs, attitudes, behavioral intentions, and usage behavior, usually focused on the initial decision of technology acceptance (Venkatesh et al., 2003). On the contrary, researchers have not paid much attention to the user resistance to the new technologies and causes of the resistance. The main reason for the restricted view is pro-change bias of the researchers (Ram, 1987) that all innovations are good and should be adopted (Rogers, 2010). However, innovations mean change to users and user resistance to change is a normal user response (Ram, 1987).

Several studies on information technology implementation have recognized the importance of user resistance. They found that user resistance and causes of resistance can be critical factors in IT/IS implementation success (Keen, 1981; Markus, 1983) and most business corporations are exposed to the high rate of new product failures primarily caused by resistance of user (Ram and Sheth, 1989). Innovators and early adopters are minority of individuals, who have no resistance to change and adopt new technology early without understanding or examining the side effects. Majority of individuals have no a priori desire to change sticking to the current satisfactory circumstances (Sheth, 1981). Thus, only after producers can overcome the resistance to change, they can cross the chasm and reach the majority (Heidenreich and Spieth, 2013).

However, despite of the importance, user resistance has not been paid much attention (Kim and Kankanhalli, 2009). Previous studies have focused on enabling factors such as perceived ease of use or perceived usefulness explaining adoption behavior, paying less attention to inhibiting factors that cause negative attitudes and discourage use. While focusing solely on the encouraging factors, important additional perceptions possibly have missed (Cenfetelli, 2004). Examining the inhibiting factors can explain why people resist or reject to adopt information systems and furthermore, why it fails in market.

Lack of research on user resistance led to incomplete conceptualization of resistance and partial understanding of the causes. While looking in the previous literature on the user resistance, only few studies are found to explicitly define the user resistance (Lapointe and Rivard, 2005) leaving user resistance a less developed concept (Heidenreich and Spieth, 2013). Moreover, the studies do not provide theoretical explanation of how and why user resistance occurs. The scope of the research was limited to specific contexts. Most of the previous literature focused on the user resistance in workplaces or organizations where individuals hardly have rights to refuse to implement (e.g., Bhattacharjee and Hikmet, 2007; Kim and Kankanhalli, 2009).

To fill the research gap, this study focus on the user resistance to IT adoption and causes of the resistance. Especially, this study examines the case of e-book. E-books have not been able to replace paper books, even though they have been on the market for quite long time. Although technical problems are being solved, user apathy still blocks the growth of e-books (Lam et al., 2009). Thus, by studying the user's resistance to the use of e-books and their causes, this study reveals why e-books cannot replace paper books. E-book publishers can recognize how to lower user resistance. This study also extends understanding of user resistance by analyzing which factors affect user resistance.

2. Background

2.1 User Resistance

Early ideas of user resistance dates back to the Kurt Lewin's (1947) studies on social equilibrium. Lewin focused on a characteristic of social systems called 'homeostasis' which means social systems, like biological systems, tend to maintain a status quo by resisting change and turning back to the original state. Therefore, if an organization want successful implementation of a change, it should break social habit to unfreeze the equilibrium between favoring forces and opposing forces. Similarly, when individuals make decisions among alternatives they stick with a status quo rather than costly alternatives (Samuelson and Zeckhauser, 1988). Majority of people have no innate desire to change and they are more typical and rational than who seek for changes (Sheth, 1981). Although an alternative is beneficial to users, the change may face user resistance (Hirschheim and Newman, 1988). Polites and Karahanna (2012) explained with the concept of inertia, an attachment to a status quo rather than better alternative. Users with inertia keep using the current IS although they are aware of the incentives from change.

From the thoughts of people's tendency to maintain status quo, there have been efforts to define resistance to change. Zaltman and Duncan (1977) defined resistance to change as "any conduct that serves to maintain the status quo in the face of pressure to alter the status quo" (p. 63). Ram and Sheth (1989) defined innovation resistance as "resistance offered by users to an innovation, either because it poses potential changes from a satisfactory status quo or because it conflicts with their belief structure." (p.6) Similar ideas of resistance have appeared in the IS research. Resistance to change has been conceptualized as an adverse reaction to a proposed change (Hirschheim and Newman, 1988), or the opposition of users to perceived change caused by implementation of a new IS (Kim and Kankanhalli, 2009; Markus, 1983).

Referring to the definitions, some characteristics of the resistance distinguished from adoption can be discovered. Most of the IS implementation research considered resistance as the opposite of the adoption (Laumer and Eckhardt, 2012). However, resistance is not the opposite of adoption (Ram and Sheth, 1989). While adoption is targeted at a specific IT, resistance is overall opposition to the consequences caused from the change. Resistance focus on the change from the status quo rather than specific IT itself (Bhattacharjee and Hikmet, 2007). Second, resistance is in a cognitive dimension while adoption is a behavior (Kuisma et al., 2007). When a user faces an innovation, resistance arises according to the degree of change. Degree of resistance varies among the users and the level of resistance affects the timing of adoption (Ram and Sheth, 1989). Users who have no resistance adopts new product early, on the other hand, users who have high resistance do not adopt the product until the resistance is overcome. Ellen et al. (1991) measured resistance to change with attitude toward change and preference for change regarding it as an evaluative response of users to change.

Therefore, resistance is not the opposite of adoption, but can possibly be an antecedent of adoption (Bhattacharjee and Hikmet, 2007). Most of the previous studies on IS adoption has investigated enablers as antecedents of adoption. Enablers including perceived ease of use and perceived usefulness have been proved to affect adoption. On the contrary, inhibitors that solely discourage adoption has not been paid attention leaving room for additional explanation for user adoption behavior. Enablers and inhibitors are not the opposite of the others and they

coexist having different antecedent and consequences (Cenfetelli, 2004). Although some of the previous studies empirically proved that different factors affect adoption and non-adoption (e.g., Eckhardt et al., 2009; Venkatesh and Brown, 2001), there is a lack of research on inhibitors. The presence of resistance discourages adoption; however, the absence of resistance does not encourage adoption (Bhattacharjee and Hikmet, 2007). Investigating the resistance as an antecedent of adoption can expand the understanding of adoption that has been confined to enablers.

2.2 Drivers of resistance to change

Adoption of new technology means change of existing practice or behavior to users. To adopt a new technology, users should allocate their resources to utilize the technology. Majority of the users are satisfied with the current way of working and changes from the satisfactory status quo may provoke resistance to change (Ram and Sheth, 1989). In addition, introduction of a new technology may conflict with the users' prior beliefs.

Sheth (1981) focused on the two causes of resistance to change; habit toward existing practice and perceived risk associated with the change. Sticking to the habit and maintaining status quo is natural human tendency. Therefore, according to the strength of the habit toward an existing practice, resistance to change increases. Other than habit, perceived risks from changes caused by adoption of new technology make people resist to the change. In addition to physical, social and economic risk, performance uncertainty, and perceived side effects cause resistance to change. Companies should take different strategies to lower user resistance depending on the causes of resistance.

Ram and Sheth (1989) developed this thought arguing that functional barriers and psychological barriers are factors causing user resistance. Functional barriers arise when users feel significant change from adopting new technology. Usage barrier, value barrier and risk barrier are classified as functional barriers. Similar to the case of habit, usage barrier occurs when the new technology is incompatible with the user's existing practice. Technologies that require changes in users' current way of working or practices make users resist to the changes and adoption of the technology. Value barrier arises when price-to-performance of technologies are low. If a new technology cannot provide value to users, there is no reason for users to change. Risk barrier is caused by users' the uncertainty or concerns about possible side effects. When users perceive possibility of harm (physical risk), high cost (economic cost), performance uncertainty (functional risk), or social disapproval (social risk) on adoption of the technology, they postpone the adoption.

Psychological barriers are caused from conflict with prior beliefs of users. Tradition and norms, and perceived product image are causes of the psychological barriers (Ram and Sheth, 1989). Tradition barrier occurs when changes by adoption of technologies conflicts with traditions or norms. Users feel uncomfortable adopting socially unacceptable technology and resist adopting. Image barrier is a barrier made of user stereotypes. When users have negative image of the technology, it can be barrier to the adoption.

Other than functional barrier and psychological barrier, self-efficacy has also been regarded as a primary factor that influence user resistance in studies on resistance (Ellen et al.,

1991; Kim and Kankanhalli, 2009). When individuals perceive that they have skill to implement the change, they are likely to have less resistance to change. As mentioned before, users should make effort to implement change. Skilled users can deal with the changes and feel burden. Therefore, self-efficacy lowers resistance to change and make users try new technologies.

2.3 Theory of Planned Behavior (TPB)

In this paper, we adopt theory of planned behavior (TPB) as a theoretical foundation to explain user resistance and e-book usage. As an extension of the theory of reasoned actions, TPB was designed to predict and explain human behavior in the specific contexts (Ajzen, 1991). It has been regarded as an important theoretical foundation in the IS/IT adoption field (Kim and Kankanhalli, 2009). The theory suggests three independent determinants of behavioral intention: Attitude toward a behavior, subjective norm, and perceived behavioral control.

Attitude toward a behavior is defined as an individual's overall evaluation of performing a behavior. The performance of the behavior can be positively or negatively valued. When individuals have positive attitude toward a behavior, they are likely to have more behavioral intention (Lu et al., 2009). In the previous literature, the attitude has been mostly approached from the positive side such as relative advantage or value (Kim and Kankanhalli, 2009). Resistance, an evaluative response of a user, can represent the negative side of the attitude. In the research model, user resistance is assessed to explain user adoption behavior.

Subjective norm is an individual's perception of whether important others think the behavior is appropriate or not. Individuals have a reluctance to do socially unacceptable behavior. If they perceive their colleagues or family does not approve a behavior, they have less behavioral intention. The concept of subjective norm corresponds to the aforementioned tradition barrier that occurs from conflicts with traditions or norms. Subjective norm is expected to serve as a tradition barrier affecting resistance and intention.

Perceived behavioral control refers to how a user perceive performing a behavior easy or difficult. The concept of perceived behavioral control is most compatible with the concept of self-efficacy, an individual's capability to perform a specific behavior (Ajzen, 1991). When users lack the necessary resources, skills, and sense of control, they would not have behavioral intention. Self-efficacy is represented in our research model expected to affect not only behavioral intention but also resistance.

In this study, user resistance and its antecedents are combined with TPB to present an integrated research model and empirically prove it. We expand the understanding of technology acceptance by examining user resistance that has not been focused much as an antecedent of the adoption behavior. In addition, by looking at the causes of resistance, we recognize what efforts should be made to make new technologies successful in the market. Figure 1 depicts the research model based on the TPB and resistance theory.

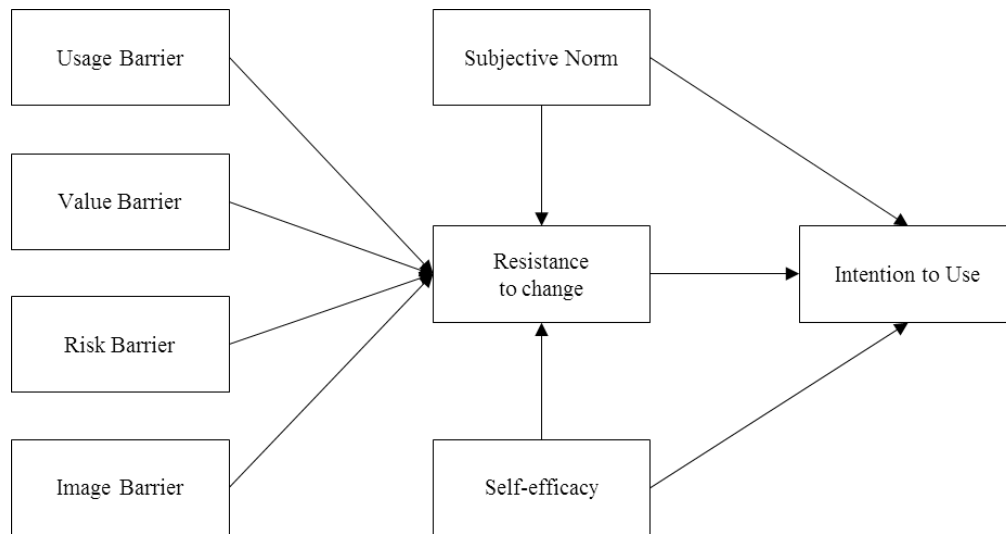


Figure 1. Research Model

2.4 E-book

Digital goods are defined as the goods which have digital forms and require physical devices to be consumed (Peitz and Waelbroeck, 2006). Not only software applications and video games being operated on the computers, films, television programs, music, books, magazines and newspapers are produced in the digital forms (Veitch and Constantiou, 2011). The development of digital technology has changed the way goods created, produced, distributed, exchanged, and consumed. It has radically decreased costs for reproduction and distribution and many types of goods (music, films, photos, books, etc.) are produced and distributed in the digital forms (Rayna, 2008).

Electronic books (e-books) refer to the books with digital forms and can be viewed on computer screens or hand-held devices such as personal digital assistants (PDAs) and Tablet PCs (Lam et al., 2009; Shin, 2011). Although e-book technology originated in the Project Gutenberg founded in 1972 (Jin, 2014), publishers began to provide books in the digital forms in the early 1990s after the Internet became widespread (Lee, 2013). When e-books began to appear on the book market, IT experts expected that e-books would substitute paper books (Gregory, 2008) threatening the traditional print publishing (Catenazzi et al., 1997).

However, the expectation did not come to realization and users still read paper books. Compared to the paper books, the market share of e-books in the book market has been marginal for a number of years. One of the key problems was insufficient contents available. Publishers were concerned about the effect of e-books on their revenues and were reluctant to make publications in the e-book format (Vasileiou et al., 2009). In addition, e-book publishers had hard times making usable contents and facilitating downloads via e-book devices (Shin, 2011). Usability of e-book devices was another problem. Users had to experience failures while installing software, downloading contents and reading e-books (Lam et al., 2009). The complex procedures for reading e-books and inconvenient devices were obstacles for e-book usage. In addition, eyestrain or eye fatigue from viewing texts on the screen also made users turning back from using e-books (Gregory, 2008; Jeong, 2012).

These technical drawbacks have gradually improved with the development of e-book related technologies such as development of e-ink and spread of smartphones and tablet PCs. Other than the technical problems, there is still psychological obstacles. User apathy is thought to be one of the challenging barrier to e-book acceptance and usage (Lam et al., 2009). Users who are used to reading texts on papers are not familiar with the concept of reading texts on the screen. Although they are already aware of the various advantages from reading e-books, they would continue to read paper books because they prefer some characteristics of the paper books. Some psychological or emotional factors are missing from the e-book user experience (Shin, 2011). Result of surveys and interviews of e-book studies ascertain the notice that users who experienced with e-books and perceived with the advantages still prefer paper books (Gregory, 2008; Shelburne, 2009; Woody et al., 2010).

To solve the problem, studies on the user resistance to the e-book is necessary. E-book publishers have to overcome user resistance to substitute paper books and reach the majority of users. Despite of the importance, user resistance has not been discussed and most of the previous studies on e-books usage have been focused on the user adoption and its antecedents (Antón et al., 2013; Bansal, 2011; Huang and Hsieh, 2012; Jin, 2014; Jung et al., 2012; Lai and Chang, 2011; Lee, 2013; Park et al., 2015). This study focus on the user resistance to e-books and the antecedents of the resistance. By investigating user resistance in the e-book context, publishers can recognize why e-books cannot reach the majority and how to overcome the barriers to adoption. In addition, this study would be helpful to the other digital products struggling in the commercial market despite of the technical strengths.

3. Hypotheses

3.1 Usage Barrier

Usage barrier is perhaps the most common cause for resistance (Ram and Sheth, 1989). Users feel uncomfortable with the changes caused from adoption of new technology because they have no innate intention to change (Sheth, 1981). A new product may not be compatible with existing practices, lifestyle or habits of users and it requires changes in their routine. Difference between the way of using a new product and users' habits increases the need for adjustment of their behaviors, and thus their resistance to the product increases (Ram, 1987). A product that keeps users' lifestyle can be familiar to users and have chances to be thought about its advantages compared to the current circumstances. However, users may turn their back to an incompatible product before they recognize advantages of the product (Holak and Lehmann, 1990). Complexity of a new technology is another usage barrier. Complex processes to adopt a new product and usability inconvenience prevent users to adopt the technology (Laukkanen et al., 2008). Users who feel uncomfortable during the course of using the product want to maintain their existing methods and leads to high resistance to change (Kuisma et al., 2007).

Users have long been reading paper books and used to the way of reading. Reading e-books require users to install specific software on the personal computers or tablet PCs. Instead of turning pages with fingers, they must click mouse button or slide the screen. Users are unfamiliar with the process and they must adapt themselves to the steps to read e-books. They

must go through the complex process of installing software and learning how to use devices. In addition, users are not familiar with reading texts on the screen. Companies made efforts to reduce the sense of difference such as adding animations that looks like turning pages of paper books and writing texts with e-ink that looks similar to the texts on papers (Lai and Chang, 2011). If reading e-books cannot offer the similar experience of reading paper books and the changing process is complex, resistance of users can increase. Thus, we suggest the following hypothesis.

H1. Usage barrier is positively related to resistance to change

3.2 Value Barrier

Value barrier is based on the value provided by the alternative. When users adopt a new technology, they should allocate resources changing from satisfactory status quo. If the perceived value from the new product is less than the cost of change, they have no reason to change. In addition, if a new product do not provide high performance-to-price value compared to the existing one, users have no motivation to change (Ram and Sheth, 1989). Users regard current product as a reference point. When a new product cannot offer superior value compared to the reference point, users does not consider changing to the alternative. Therefore, users are not willing to adopt the product that does not give better performance compared to the current one (Heidenreich and Spieth, 2013; Ram, 1987). People tend to stick with the existing product because disadvantages of changing from the status quo seems larger than advantages (Kahneman et al., 1991; Samuelson and Zeckhauser, 1988).

E-book readers provide several useful functions to users including hyperlinks, text-to-speech, bookmark, and search functions (Lai and Chang, 2011). In addition, tablet PCs and smartphones with which users can read e-books, offers portability and a number of books can be stored in them (Antón et al., 2013). Users compare these advantages from reading e-books and satisfaction from conventional way of reading that fulfills physical and nostalgic needs. If users feel reading e-books are more advantageous than reading paper books, they may take switching cost caused from the process of change (Huang and Hsieh, 2012). The belief that reading e-books offer benefits over conventional way of reading make users have positive feeling about e-books reducing resistance to change (Antón et al., 2013). Thus, we suggest the following hypothesis.

H2. Value barrier is positively related to resistance to change

3.3 Risk Barrier

A new product necessarily contains uncertainty to some extent (Ram and Sheth, 1989). User often experience uncertainties from adopting a new product and likely to perceive usage of the product negatively (Jiang et al., 2000; Kleijnen et al., 2009). They concern whether a new product would work properly (Heidenreich and Spieth, 2013). The uncertainty causes fear of losing status, becoming apart from friends, or being unable to learn skills (Hirschheim and Newman, 1988). Users who recognize the risk caused by the uncertainties tend to postpone adopting the product until they sufficiently have cognition about the product (Ram and Sheth,

1989). The higher the perceived risk, the greater the resistance to the change (Ram, 1989).

Previous literatures has classified risks into four categories of physical risk, economic risk, functional risk, and social risk (Kleijnen et al., 2009; Ram and Sheth, 1989). Physical risk means perception of damage to a person or property caused by the innovation. Economic risk arises from the cost of an innovation. The cost may come to nothing if a product does not work well or another cheaper product appear in the market. Functional risk is related to the user concerns about whether a product would work properly and reliably. Finally, social risk occurs when users are not confident about whether a usage of a product is accepted by social environment.

Users are not fully aware of e-book readers and e-book technology and it inevitably causes uncertainties of user. Especially, users feel uncomfortable about reading process that requires installing software, downloading books and reading on the screen. The reading process of e-book is more complicated than that of paper books and user have not fully aware of it. They are uncertain about whether the e-book devices work properly before they fully understand the process. Moreover, if users cannot operate e-book devices or a cheaper and better alternative appear in the market, the cost for adopting the e-book becomes worthless. E-book technology is still being rapidly developed and new devices are appearing on the publishing market. Users who perceive functional and economic risk from the adopting e-books feel resistance to adopt e-books. Thus, risk barrier is positively related to resistance to change

H3. Risk barrier is positively related to resistance to change

3.4 Image Barrier

A product has specific identities such as product class, belonging industry, or the place in which they are produced. If users do not favor any of these properties, they have negative image about the product and it becomes barrier to adoption (Molesworth and Suortti, 2002; Ram and Sheth, 1989). As the actual characteristics of products are hard to observe, users make their own image of the product with their stereotypes, rumors from the others and indirect, non-experiential sources. If the image is stamped negatively, it leads to resistance to change (Kleijnen et al., 2009). For example, users who have negative images about products from some foreign countries perceive the quality of the products to be inferior and are skeptical to adoption (Ram and Sheth, 1989). Electronic banking service suffered from the negative “hard-to-use” image and has been neglected by non-users (Laukkanen et al., 2008).

Users are not familiar with e-books regarding them to be hard to access (Gregory, 2008). When users think of e-books, they recall eye fatigue from reading the text on screens and complex access process (Bansal, 2010). The negative image of e-book make users to resist change from paper book. Thus, we suggest the following hypothesis.

H4. Image barrier is positively related to resistance to change

3.5 Traditions Barrier

Traditions and norms are other causes of psychological barrier. Need for social

relationships make people tend to compare their behavior with the behaviors of the important others (Kim and Kankanhalli, 2009). While comparing, they have pressure to act in the manners that the others behave (Eckhardt et al., 2009). When an adoption of a technology is not socially acceptable, users feel pressure not to adopt the technology. It leads to the traditional barrier and a user feels reluctant to adopt the technology (Laukkanen et al., 2008).

The social pressure from the others has been frequently measured as subjective norm in the IT acceptance research (Lee et al., 2006). Subjective norm refers to the perception of whether important others think the behavior is appropriate or not (Ajzen, 1991). It plays an important role in determining behavioral intention of individuals (Han et al., 2010). Although it has been utilized to describe the behavioral intention directly, subjective norm also plays a role of tradition barrier lowering the resistance of adopting socially accepted technology. For e-book users, when there are others who read e-books and feel reading e-books is socially acceptable, the resistance to change is lowered and possibly have more intention to adopt e-book. If not, the users want to stick with reading the paper books that has been tradition for a long time. Thus, the following hypotheses are suggested.

H5a. Subjective norm is negatively related to resistance to change

H5b. Subjective norm is positively related to intention to use

3.6 Self-efficacy

Self-efficacy refers to the perceived ability or skill to perform a specific behavior. Self-efficacy has been regarded as one of the determinant of behavioral intention (Han et al., 2010; Lu et al., 2009). People who can handle the changes from the adoption are likely to have more intention to adopt. Users with a high level of self-efficacy can deal with the changes from the adoption. However, users with low level of self-efficacy are likely to resist the change feeling discouraged (Kim and Kankanhalli, 2009). Even when an adoption of a new technology is known as better, users with low-self-efficacy often choose to remain using the current one which they can handle the best. They feel discomfort from the change that they cannot deal with and it causes resistance to change (Ellen et al., 1991). In the early 2000s, the lack of relevant knowledge inhibited PC adoptions functioning as a barrier to adoption (Venkatesh and Brown, 2001).

Reading e-books requires users' skills to properly operate devices, install specific programs, purchase books and download books. On the contrary, paper books do not require specific skills for reading the books. Users who are not used to the digital technologies and have fewer skills feel afraid of adopting e-books. They feel discomfort from adopting e-books and it leads to resistance. On the contrary, users who are capable of handling the process are likely to have less resistance and have more intention to adopt e-books. Thus, the following hypotheses are suggested.

H6a. Self-efficacy is negatively related to resistance to change

H6b. Self-efficacy is positively related to intention to use

3.7 User Resistance

Adoption of a new technology means changing from a satisfactory status quo that requires users cost of change. Majority of people have no innate desire to change and want to stick with the status quo. They want to maintain psychological equilibrium often resisting to go through the disturbing process of changes (Ram, 1987). Although a new technology is acknowledged as better one, the process of change often involves substantial changes in users' daily routine or work processes (Ellen et al., 1991). Resisting changes is a normal response of the users when confronted with changes (Bhattacharjee and Hikmet, 2007). The greater the change, the higher the resistance. Resistant users may remain using the current system not adopting the new one. Therefore, the level of resistance would affect subsequent adoption behavior. People with high resistance are likely to read paper books while the others with less resistance would like to adopt e-books. Thus, we suggest the following hypothesis.

H7. Resistance to change is negatively related to intention to use

4. Research Methods

4.1 Data collection and sampling

With regard to the data collection, we used a web-based survey method. We went through a multistep process to develop the survey instrument and for data collection. First, we pilot tested the preliminary measurement items adapted from previous studies. The questionnaires were given to 50 e-book users and graduated students from related disciplines to confirm the clarity of the questions and validity of the items. Small revisions were made according to the comments of the participants. Therefore, the items were further clarified to make their wording as precise as possible and ambiguous questions were revised or deleted.

In the first part of the questionnaire, respondents were asked to fill out their demographic data, including gender, age, and education level. The respondents were gathered during a week on March 2017 and we collected the 350 samples. Table 1 shows the demographic information of 350 samples.

Table 1. Demographic Statistics

Measure	Items	Frequency	Percent
Gender	Male	110	31.0%
	Female	240	69.0%
Age	Under 20	23	7.0%
	20's(21-29)	87	25.0%
	30's(30-39)	151	43.0%
	40's(40-49)	54	15.0%
	50's or more	35	10.0%
Education	High school or less	65	18.6%
	College student	33	9.4%

	Bachelor's degree	215	61.4%
	Graduate student	5	1.4%
	Master's degree or more	32	9.1%
Annual income	Below \$10,000	71	20.3%
	\$10,000 - \$19,999	0.49	14.0%
	\$20,000 - \$29,999	95	27.1%
	\$30,000 - \$39,999	64	18.3%
	\$40,000 - \$49,999	25	7.1%
	\$70,000 or more	46	13.1%
Usage Experience	Never	174	49.7%
	Smartphone	116	33.1%
	Tablet PC	41	11.7%
	E-book reader	4	1.1%
	Persnal computeer	15	4.3%

4.2 Measurements

We measured all constructs to be assessed on a seven-point Likert-type scales anchored at 1=strongly disagree and 7=strongly agree. To ensure the validity of the survey questions, items were adapted from previous literatures and modified for the e-book context.

As reviewed, we selected four barriers as exogenous variables. Among them, Usage barrier, value barrier and risk barrier were operationalized as second-order constructs. Second-order factor Usage barrier consisted of two first-order dimensions, namely compatibility and complexity. Items COMT1 to COMT3, COMX1 and COMX2 used for measuring compatibility and complexity, respectively, were revised from Huang and Hsieh (2012). Another second-order factor value barrier consisted of relative advantage and perceived value. The dimension of relative advantage is referenced from Huang and Hsieh (2012) and Jin (2014), and measured by four items, RA1 to RA4. Items PV1 to PV3 for measuring perceived value were derived from Kim and Kankanhalli (2009). Risk barrier were dealt with perspectives of performance risk and financial risk, and each risk were measured with PR1 to PR3 and FR1 to FR3. The items for the risks were adapted from Stone and Grønhaug (1993). 3 items, IB1 to IB3, for measuring image barrier were referenced from Laukkanen et al. (2007).

Self-efficacy was measured using 3 items (SE1 to SE3) from Kim and Kankanhalli (2009) and Subjective norm was measured by SN1 to SN3 (Ajzen, 1991; Jin, 2014; Venkatesh et al., 2003). Items RC1 to RC4 used for measuring resistance to change were revised from Kim and Kankanhalli (2009) and Lee (2013) and developed based on Ram and Sheth (1989). Finally, we measured Intention to use with IU1 to IU3 from Venkatesh et al. (2003).

4.3 Analysis

In this study, we designed the research model with Structural Equation Modelling (SEM). We adopted SEM since it allows researchers to suggest and test propositions in theory

development about the relationships among latent variables. And we used partial least square (PLS) technique with SmartPLS 3.0 to perform the data analysis. The main purpose of using PLS is to make it possible to predict the indicators of the dependent variables and PLS is best suited for estimating the parameters of the measurement model and regression paths among the latent variables in the structural research model by minimizing residual variances.

4.4 Reliability and Validity

Construct reliability and convergent validity were established via confirmatory factor analysis using SmartPLS 3.0. Reliability is defined as the internal consistency of the indicators measuring a given factor. The reliability of each instrument was assessed by calculating Cronbach Alpha and Composite Reliability. The acceptable threshold of Cronbach Alpha is greater than 0.70 and recommended criterion of Composite Reliability is also generally above 0.70 (Fornell and Larcker, 1981; Hair et al., 1998; Nunnally, 1978). As shown in table, Cronbach Alpha of each construct was above 0.70 and all the Composite Reliability of each factor were also above 0.70. So, both Cronbach Alpha and Composite Reliability values shows adequate reliability values.

Convergent validity is referred to the degree to which two or more measures of constructs that theoretically should be related, are in fact related. Convergent validity was assessed by calculating the average variance extracted (AVE) and outer loadings. According to criteria recommended by Fornell and Larcker (1981), AVE from each construct should be greater than 0.50. The table 2 show all of outer loading values and AVE were greater than 0.50.

Discriminant validity is defined as the degree of measuring of distinct constructs differ. The AVE and shared variance was used to assess discriminant validity. Assessing discriminant validity, it is recommended that square root AVEs should be greater than the correlations in the corresponding row and column (Chin, 1998; Jöreskog and Sörbom, 1996). As shown in Table 3, the results satisfied requirement and implied the values were acceptable.

Table 2. Reliability

	Cr. Alpha	CR	AVE
Functional Barrier	0.877	0.91	0.67
Value Barrier	0.912	0.93	0.656
Risk Barrier	0.881	0.914	0.68
Image Barrier	0.84	0.904	0.758
Subjective Norm	0.836	0.901	0.752
Self-efficacy	0.906	0.941	0.842
Resistance to change	0.9	0.931	0.77
Intention to use	0.958	0.973	0.922

Table 3. Validity

	FB	IB	IU	RB	RC	SE	SN	VB
FB	<i>0.818</i>							
IB	0.575	<i>0.87</i>						
IU	-0.605	-0.45	<i>0.96</i>					
RB	0.383	0.626	-0.346	<i>0.824</i>				
RC	0.623	0.803	-0.596	0.576	<i>0.878</i>			
SE	-0.464	-0.18	0.361	-0.273	-0.201	<i>0.918</i>		
SN	-0.344	-0.203	0.414	-0.236	-0.235	0.334	<i>0.867</i>	
VB	0.708	0.522	-0.557	0.29	0.572	-0.252	-0.29	<i>0.81</i>

Note: Diagonal elements (in italics) are the square root of the average variance extracted (AVE); off-diagonal elements are the correlations among constructs; for discriminant validity, diagonal elements should be larger than off-diagonal elements.

4.5 Hypotheses testing and result

In order to test the significance and strength of the proposed hypotheses, a 5,000 subsample bootstrap method was used. Judging that our number and quality of samples were sufficient to test, we conducted a bootstrap procedure with 5,000 re-sampling. Figure represents the results of the testing structural model. The proposed model could account for 69.6% of the variance in resistance to change and 45.9% of the variance in Intention to use. The result is summarized in figure 2.

The structural model results show that 7 out of 9 hypotheses were supported with an over 95 percent confidence interval for a two-tailed test. All of the barriers in the research model were significantly related with resistance to change. Usage barrier was positively related with resistance to change ($\beta = 0.191$, $p < 0.001$). Value barrier also increased resistance to change ($\beta = 0.12$, $p < 0.05$). Risk barrier was associated with resistance to change ($\beta = 0.134$, $p < 0.01$) and image barrier significantly affected to resistance to change ($\beta = 0.556$, $p < 0.001$). Both subjective norm ($\beta = 0.235$, $p < 0.001$) and self-efficacy ($\beta = 0.181$, $p < 0.001$) displayed significant impact on intention to use while relationships between resistance to change and them were not supported. Finally, resistance to change had a strong impact on Intention to use ($\beta = -0.504$, $p < 0.001$).

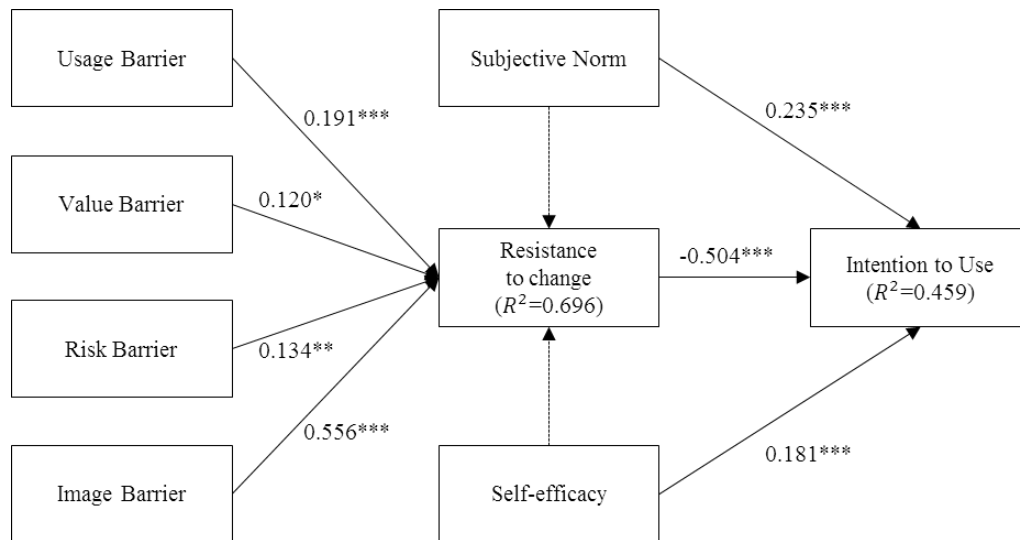


Figure 2. Summary of result
(Note: arrows with dotted line refers to unsupported hypotheses)

5. Discussion

Ram and Sheth (1989) suggested five antecedents of user resistance: usage barrier, value barrier, risk barrier, tradition barrier and image barrier. Except tradition, the barriers seem to cause resistance to change. First, when an adoption of a technology brings changes that are not compatible with the user habits and the process of the adoption is complex, the change faces user resistance. Although the appearance of smartphones and tablet PCs lowered the usage barrier of e-books, still the usage barrier make people resist to using e-books. Value barrier occurs when an adoption of a technology does not provide price-to-performance. Consistent with the previous studies, when users perceive low value from the e-books feel reluctant to adopt e-books. Risk barrier is consisted performance risk and financial risk. Users who think that e-book would not work properly or that the adoption of e-books would be worthless feel discomfort from changing the way of reading. Finally, image barrier was found to have positive effect on the resistance to change. Users have stereotypes that e-books are hard to read and they causes eye-fatigues. The stereotypes make users to be reluctant to adopt e-books.

Among the barriers, we could not found the relationship between resistance to change and traditional barrier which was measured with subjective norm. Social acceptance does not seem to affect the resistance to change. Rather, when people perceive that others are reading e-books, they are likely to adopt e-books. The similar result was obtained by examining the relationships among self-efficacy, resistance to change and intention to use. Self-efficacy does not have effect on resistance to change, but significantly have positive effect on intention to use. According to Cenfetelli (2004), enabling factors only encourages the behavioural intention while inhibiting factors only discourages intention. Each has specific effects on the intention and the absence of inhibiting factors does not guarantee the adoption. Eckhardt et al. (2009) empirically proved that different factors affect the adoption and non-adoption behaviours. Some of the factors that affected the adoption intention did not have any effect on the non-adoption intention. Some of the other factors worked in the opposite way. From the result, we

could identified the roles of the factors. Subjective norm and self-efficacy affect intention to use and does not affect resistance proving the characteristics of enabling factors. As proposed, the resistance to change is negatively related to intention to use. When people feel discomfort from the adoption of a technology, they have lower intention to adopt.

From the findings, this study contributes to the understanding of technology acceptance behaviours. Resistance and inhibiting factors has not been spotlighted in the previous literature. By examining the resistance and its effect on behavioural intention, we could identify the effect of the factors that only discourages usage. Although the model was adapted to e-book case, it could be utilized for individual adoption intention of other digital goods.

This study also gives insights to digital goods providers, especially e-book publishers. The barriers suggested to cause resistance were found to have effect on the resistance except traditional barrier. In order for users to adopt a new technology, the resistance should be eliminated. Only after solving resistance problem, the technology can cross the chasm and reach the majority of users (Ram and Sheth, 1989). To reduce the resistance, the providers can make effort to remove barriers. Giving the similar usage experience or trial experience can lower usage barriers. To give consumers good points compared to existing products can reduce value barriers. With these efforts, the providers can lower the user resistance and the probability of failure in the market.

6. Conclusion, limitations, and future research

The purpose of this study was to expand the understanding of technology acceptance by examining why people resist adopting a new technology. The integrated model combined TPB and resistance theory was suggested and empirically proved. Our research findings confirm that four barriers causes the resistance to change and users with higher resistance have lower intention to use. As proposed in the previous literature adopted TPB as theoretical background, subjective norm and self-efficacy were found to have positive effect on the intention to use. However, resistance to change does not mediate the relationships among subjective norm, self-efficacy and intention to user. The suggested model improves the understanding of adoption behaviour and identified the antecedents of resistance to change.

Despite of the contributions, there are limitations of this study. We used survey method to prove the proposed research model. The barriers have not been investigated by the previous studies resulting in the less developed items used to measure the barriers. Many of them were reversed version of the items for measuring enabling factors. By further investigating the resistance and its antecedents, measurement issue would be solved. The correlation between image barrier and the resistance to change is another issue. Although the correlation is lower than the square root of AVE and there are no problems with the result of the validity test, the correlation between the two constructs is high enough to reconsider the items for the measurement. The two constructs were differentiated conceptually; however, they need more considerations in the developing suitable measurement items.

For further research, comparing the users and non-users can be meaningful. Users can feel resistance before the adoption and during the usage. This study did not compared the two groups, however, the different results would be derived comparing the two groups. Not only

comparing users and non-users, comparing platform can give insight. Each platform has different characteristics and provide users with different features. Although users from the different platforms were not differentiated in this study, the characteristics of the platforms can affect the results.

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