

## Chapter 2

# The Understanding of Building Trust Model on Smartphone Application: Focusing on Users' Motivation

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**Abstract** Smartphone application is expected to be influential because the number of the smartphone users is growing. Smartphone has the advantage of the wireless internet, interactivity, mobility and flexibility, furthermore facilitates the potential adoption of new mobile applications. Therefore, it is necessary to understand building trust on the mobile application use behavior. The purpose of this study is to find out what really drives the trust and satisfaction to use the smartphone applications, intrinsic or extrinsic motivation factors. The 231 sets of data collected from smartphone users, were tested against the model using PLS 2.0. The result of this study is that extrinsic motivation factors are more influential on the building trust than intrinsic motivation factors.

**Keywords** Trust · Expectation · Satisfaction · PLS (Partial Least Squares) · Smart-Phone · Application · Mobile · Motivation

## 2.1 Introduction

Smart-phone has become the driving force of cell phone change. According to Gartner, market research institution, the latest statistical data show that the total number of cell phone had reached to 1.211 billion last year in the world.

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This means that the global cell phone market is nearly saturated. However, smart-phone is just getting started. In 2010, the number of smart-phone was 1.72 billion with an annual growth rate of 23.8%. Until 2015, this number will increase to 2.5 billion. There are hundreds of thousands of applications available in smart-phone. Recent applications of smart-phone are used for everything from entertainment to tracking social networking to reading a book. These statistics shows applications of smart-phone are important domain in ICT (information communication telecommunication) environment. In spite of important domain, relatively few studies have investigated the trust. Prior studies for application services of smart-phone mainly focus on how users adopt or continuance an application service. Because of hundreds of thousands of applications, people can easily download and install applications. However, they use only a few applications instead all downloaded applications. Therefore, we should understand building trust to expand use of various applications. The purpose of this study is to investigate the effect of important variable, focusing on motivational factors, on trust and satisfaction of smart phone applications. To achieve our research purpose, we provide expectation and trust concept as the theoretical background.

## 2.2 Literature Review

### 2.2.1 *Expectation*

Several prior studies have explained user's IT behavior by the expectation. Expectation is defined as a set of pre-exposure beliefs about the products or services [1].

Motivation theorists have explained that motivation is the classification for the variety of expectation factors. Each expectation factor, usefulness, understandability, ease of use, and enjoyment, pertains to different motivation dimensions. Motivation affects the behavior when users adopt a IT. We use the expectation concept to explain how people build trust in the smart phone applications. Studies of post adoption treat expectation and motivation as closely linked [2].

Ryan and Deci [3] distinguish the effects of extrinsic and intrinsic motivation on individuals' IT behaviors based on the self determination theory. Extrinsic motivation relates to the performance of an activity, it is perceived to help achieve valued outcomes that are distinct from the activity itself [3]. Intrinsic motivation focuses on the activity for its inherent satisfaction rather than for some consequence [3].

Perceived usefulness can be defined as informative, valuable, or instrumental information [4, 5], and understandability can be defined as the degree of cleared information, ease of reading and understanding information [5]. Perceived usefulness and understandability are components of extrinsic motivation that involves consuming products or services in an efficient to achieve the goals with a minimum

of annoyance. Because hedonic systems are globally popular in e-commerce these days, intrinsic motivation should be looked into further for successful IS adoption, not in traditional systems [6].

While perceived enjoyment and ease of use those are intrinsic motivation, refers to deriving hedonism and comfortability from the consumption process [7]. Perceived enjoyment can be defined as the extent to which the activity of using the IT device is perceived to be enjoyable in its own right, and this property is separate from any beneficial performance consequences that may be anticipated [8]. Ease of use, which refers to the extent to which the system is visually appealing, consistent, entertaining and easy to use [5].

### **2.2.2 Trust**

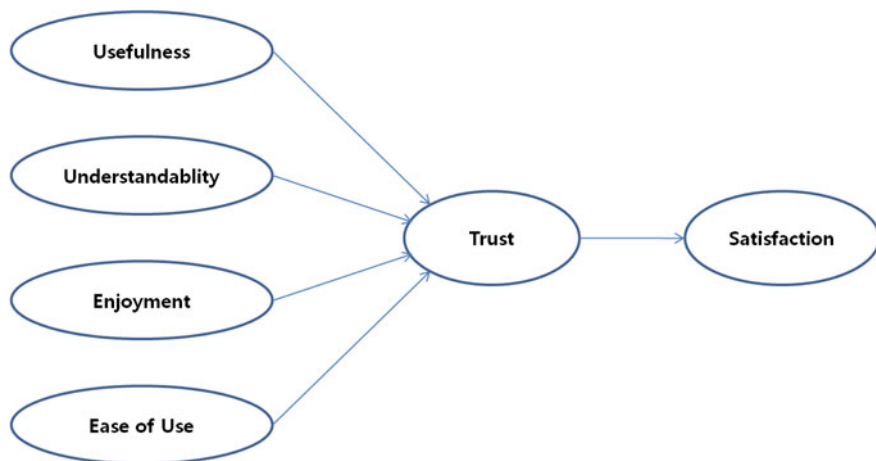
Trust can be defined as “confidence that the behavior of another will conform to one’s expectations and in the goodwill of another” [9]. Trust is the feature of most economic and social interactions in which uncertainty is present. Practically trust is a required element in all interactions, especially those conducted in the uncertain environment of e-commerce [10–12]. Trust has been brought to public attention because it plays a role in creating satisfied and expected outcome as a result of transaction [12, 13].

These days, social and economic institutions increasingly assume the role of fostering and nurturing trust in the online exchange processes [14]. Mobile technology is confronted with similar problems which the early online exchange experienced, such as concerns on security or privacy [15].

Mobile devices are difficult to use friendly, because of negative technical aspects like small screens, keypads, and low-resolution displays [15, 16]. Chae and Kim [17] suggested that limited system resources can disturb the development of trust in m-commerce. Customer trust in mobile commerce can be classified as mobile vendor and mobile technology, especially in the early stages, the online trust of the mobile technology is more important than of the mobile vendor [16]. Therefore this study focuses on the trust of the mobile technology.

### **2.2.3 Satisfaction**

Customer satisfaction can be defined as the summary psychological state resulting when the emotion surrounding disconfirmed expectations is coupled with the consumer’s prior feelings about the consumption experience [18]. User satisfaction, which is a critical construct because it is related to other important variables, is often considered as an important determinant of IS success, continuance intention, and customer loyalty [19]. A consumer who trusts an institution has expectations for satisfaction with regard to that institution’s website that are likely



**Fig. 2.1** Conceptual framework

to be confirmed. If an offline bank is considered trustworthy, that positive satisfaction will project toward the bank's online (or mobile) counterpart. This is why trust in mobile banking should positively affect customers' satisfaction [20] .

## 2.3 Research Model

Based on above studies on Smartphone applications and trust, the following model is tested. Figure 2.1 presents the study's conceptual framework, showing the hypothesized relationships between the constructs.

## 2.4 Research Method

We conducted survey to achieve our research purposes. Questions for six constructs (perceived usefulness, perceived understandability, perceived enjoyment, perceived ease of use, trust and satisfaction) were gathered through the extant literature. We checked content validity of the selected questions through in-depth interview with three industrial experts in smart-phone. A pre-test was conducted with 70 smart-phone users and allowed us to delete questions that did not contribute to the research question. The final questionnaire presented in Table 2.1.

All questions were rated on a 7-point Likert scale that ranged from 1 for "strongly disagree" to 7 for "strongly agree". Among the 300 total questionnaire responses, 231 remained after surveys with missing or invalid data were excluded.

**Table 2.1**

	Items	Questionnaire
Usefulness	1	I find the Smartphone application useful in my daily life
	2	Using the Smartphone application helps me accomplish things more quickly
	3	Using the Smartphone application improves my chances of achieving things I find important
	4	I think App store provide the useful Smartphone applications
Understandability	1	App store clearly provides the classified smart phone application menu
	2	App store provides detailed information about the smart phone application
	3	App store provides detailed manual about the smart phone application
	4	App store provides detailed information about the smart phone application function
Enjoyment	1	I think it is fun to use Smartphone application
	2	I think the process of using Smartphone application would be pleasant
	3	I think using Smartphone application would bring me pleasure
	4	I enjoy using Smartphone application
Ease of use	1	My interaction with the Smartphone application is clear and understandable
	2	Interaction with the Smartphone application does not require a lot of my mental effort
	3	I find it easy to get the Smartphone application to do what I want it to do
	4	I find the Smartphone application to be easy to use
Trust	1	My Smartphone application provider can be relied upon to keep promises
	2	My Smartphone application provider is trustworthy
	3	I have full confidence in my Smartphone application provider
	4	I have full confidence in my Smartphone application security
Satisfaction	1	My overall experience of Smartphone application use was: very satisfied
	2	My overall experience of Smartphone application use was: very contented
	3	My overall experience of Smartphone application use was: absolutely delighted

## 2.5 Analysis and Results

Individual composite reliability, convergent validity of the measures associated with individual constructs, and discriminant validity can assess the adequacy of the measurement model [21]. We first assessed the composite reliability of constructs for all questions which ranged from 0.84 to 0.97. We also found that questions had convergent validity, with significant loadings and t-statistics well above the threshold value [22]. Convergent validity is adequate when items load highly (loading >0.50) on their associated factors [23]. The average variance extracted (AVE) from the construct should be greater than the variance shared between the construct and other constructs in the model for satisfactory discriminant validity

**Table 2.2** Measurement model results

	Items	Standardized factor loading	Cronbach's $\alpha$	AVE	Composite reliability
Usefulness	1	0.709	0.833	0.77	0.85
	2	0.822			
	3	0.792			
	4	0.739			
Understandability	1	0.582	0.939	0.81	0.88
	2	0.895			
	3	0.907			
	4	0.826			
Enjoyment	1	0.885	0.874	0.85	0.97
	2	0.868			
	3	0.864			
	4	0.761			
Ease of use	1	0.890	0.914	0.84	0.95
	2	0.872			
	3	0.861			
	4	0.724			
Trust	1	0.629	0.886	0.75	0.96
	2	0.648			
	3	0.853			
	4	0.849			
Satisfaction	1	0.798	0.849	0.79	0.84
	2	0.801			
	3	0.782			

**Table 2.3** Path results

Independent variable	Dependent variable	$\beta$ (t)
Usefulness	Trust	0.215 (2.206)
Understandability		0.378 (3.945)
Enjoyment		0.083 (0.946)
Ease of use		0.157 (1.557)
Trust	Satisfaction	0.594 (9.449)

[24]. Table 2.3 shows that all of the measures loaded much higher than the suggested threshold. Table 2.2 shows results that verify the discriminant validity of the questionnaire items used in our study.

This study tests hypotheses by using Smart PLS 2.0. The partial least squares (PLS) method was used to test the research model and outcome variables. We analyzed the data via PLS. The test of the structural model included estimating the path coefficients and R2 values, which shows the predictive power of the model. Table 2.3 show the results of the structural model. The results show that extrinsic motivational factors had significant positive effects on trust. Intrinsic motivational factors had not significantly effects on trust though in the predicted direction, did

not reach statistical significance. Perceived understandability affects trust most heavily ( $\beta = 0.378$ ), followed, by perceived usefulness ( $\beta = 0.215$ ).

## 2.6 Conclusion

This study empirically investigates the effects of motivational factors on the trust. To achieve our research purposes, we suggested trust model in applications on smart-phone environment and conducted survey to empirically verify our hypotheses. The results showed that extrinsic motivational factors have influence on trust.

This study has several limitations. First, this study used important variables as intrinsic and extrinsic motivational factors. A future study could add other motivational factors to effectively explain the relationship between motivation and trust. Second, we did not conduct longitudinal study to understand the effect of motivation by enabling an evaluation of use patterns over time. Third, we used students as respondents, who mainly use for entertainment. Therefore, future study should consider other respondents group such as workers. Business workers mainly use for utilitarian purpose than hedonic purpose so that the effect of motivational factors on trust may be different.

Even though these limitations, we have several implications. First, only a few of trust researches did not have examined users' trust in regards to application services of smart-phone. Second, we verified the relationship between motivational factors and trust. The results showed that the effect of extrinsic motivational factors on users' trust has stronger than the effect of intrinsic motivational factors on users' trust.

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<http://www.springer.com/978-94-007-2910-0>

Proceedings of the International Conference on IT  
Convergence and Security 2011

Kim, K.J.; Ahn, S.J. (Eds.)

2012, XIV, 642 p., Hardcover

ISBN: 978-94-007-2910-0