

## Measurement of The Adoption of Facebook.Com

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**Abstract.** Facebook.com is increasingly being used by young people. Such technology affects people in many facets. The purpose of this research is to develop a measurement model assessing the adoption of Facebook.com; then this model will be used in future research. Undergraduate students (n=382) in a Thai university were selected; exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were employed to analyze the data. The results show that five components named as the following: 'Intensity', 'News', 'Snoop', 'Information Receiving', and 'Relationship Management', are accepted as the components to measure the adoption of Facebook.com. Suggestions for future research are addressed in the end.

**Keywords:** Internet, Online Social Network, Facebook.com, Measurement, and Technology Adoption.

### 1. Introduction

Online social networks are being increasingly used by university students and this technology has been influencing their lives in many aspects [1]. For 10 years, several hundred million people around the world have experienced online social networks [2]. On Facebook.com, more than 500 million people are using this site [3]. Facebook.com is a favorite website among college students in the United States [4]. Nevertheless, 70% of Facebook members lived out site the United States [3]. Facebook.com has become the most visited website in Thailand and the number of visitors of Facebook.com has soared to 8.1 million visitors a month, compared to 4.6 million to Hi5.com during the same period [5]. Despite a vast increasing number of its members, there are few studies relating to Facebook.com [6]. In addition, even though there have been a number of studies in the West, very few have been done in Thailand.

### 2. Literature Review

A massive number of people share their information on Facebook.com. Nowadays, Facebook.com is developing its information sharing process becoming more efficient with an easy structure of interaction [7]. Interactions on Facebook.com are valuable sources of information [8]. Online social networks have been used by people or organizations to engage their customers and to share information about products or services [9]. Students use online social networks to share their opinions about political activities; Online social networks proffer freedom and rights of expression of students on the Internet [10]. Online social networking allows users to express and organize their information relating to personal preferences and characteristics such as age, religion, politics, hobbies and interests. Online social networking is generally accepted as an important activity for young people [11]; they are using Facebook.com to search for their lost or new friends [2]. Teenagers seek for more new online friends than adults [12]. Facebook's members can create their groups for particular purposes [13]; Those people use Facebook.com to stay in touch with their old friends, to develop and to maintain their relationships [8]. Adopting online social networks is an interesting phenomenon and such websites contribute a great impact on human communication and

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connection [14]. Facebook.com has become the greatest important website for online social communication [15]. People are motivated to use Facebook.com to communicate with other people, so communication benefits are an influential factor that drives people using Facebook.com [15]. Facebook.com does not only connect its members together, but also offers connections with members of other sites [2]. Hence, Facebook.com can be used as an communication tool [13], weakening barriers of communication [9].

For technology adoption, user’s behaviour is normally the last variable [16-19]. User’s behaviour may refer to the actual use which accounts for questions such as a number of hours (or minutes) per week (or day), and frequency of use (or how frequently use) [18, 20, 21]. In addition, some studies divide technology use into tasks or functions of technology [22, 23].

### 3. Methodology

#### 3.1. Samples and the sampling method

For exploratory factor analysis, the number of samples should be greater than 20:1 [24]. The minimum number of samples in this research should be more than 360 (this research had 18 items at first and 4 were removed). However, we obtained 382 samples in a Thai university based on area sampling (cluster sampling) in 5 locations.

#### 3.2. Definition and Measurement

We defined ‘technology adoption’ as the degree to which features (or activities) of Facebook.com were selected to use. A questionnaire was distributed to each sample. The items 1-3 consisted of a 5-intervale scale, and the items 4-14 contained a 5-Likert’s scale (very often, often, sometimes, rarely, to never use).

#### 3.3. Statistical Analysis

Exploratory factor analysis (EFA) with varimax rotation was employed to group items and to form the components of Facebook activities. Confirmatory factor analysis (CFA) with maximum likelihood was used to confirm constructed validity of this measurement.

### 4. Results

The figure 1 shows the results of confirmatory factor analysis. The numbers in the figure are coefficients.

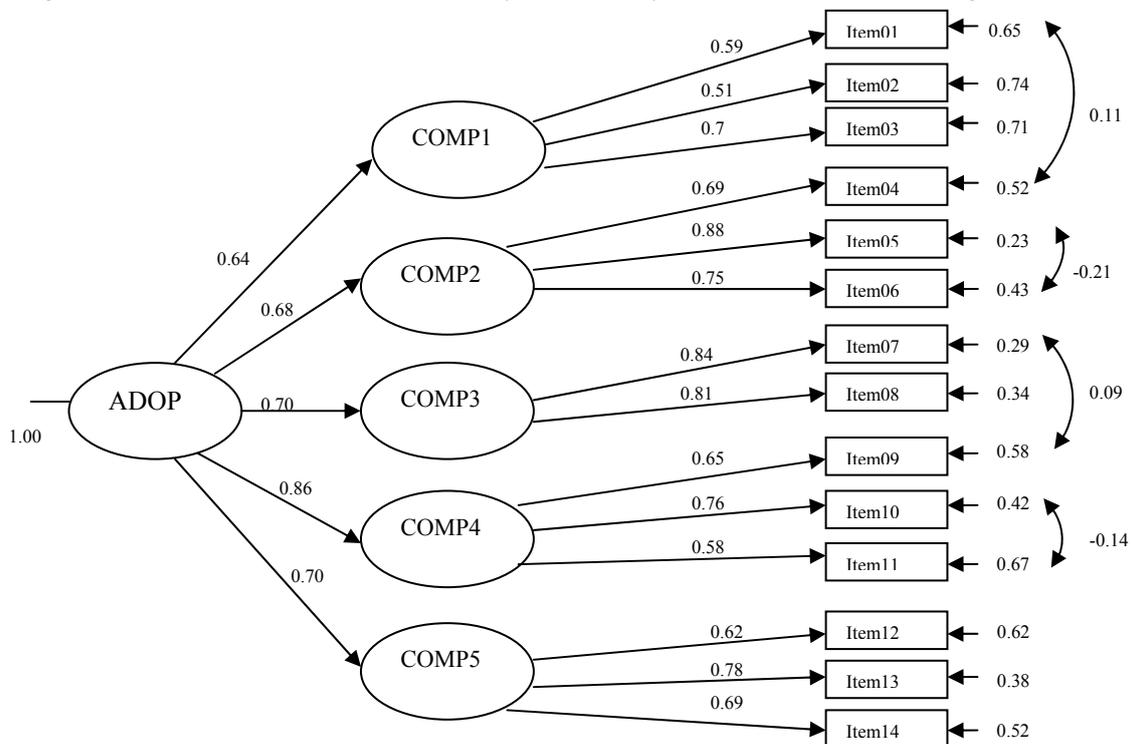


Fig. 1: Standardized coefficients of the technology adoption

All connections were significant ( $p < 0.05$ ). Statistics of the model: Chi-Square = 88.24,  $df = 68$ , P-value = 0.05006, RMSEA = 0.028, Standardized RMR = 0.034, CN = 401.45, GFI = 0.97, AGFI = 0.95, and PGFI = 0.63

According to figure 1, our measurement of the adoption of Facebook.com could be divided into five components: COMP1, COMP2, COMP3, COMP4, and COMP5; these components consisted of coefficients: 0.64, 0.68, 0.70, 0.86, and 0.70 respectively. Among these components, the fourth component (COMP4) was the strongest indicator of the adoption of Facebook.com, while the first component (COMP1) was the weakest. Then, we can summarize the primary item of each component in the following:

In COMP1, item1 was the strongest indicator of this component; the coefficient of this item accounted for 0.59.

In COMP2, item5 was the strongest indicator of this component; the coefficient of this item accounted for 0.88.

In COMP3, item7 was the strongest indicator of this component; the coefficient of this item accounted for 0.84.

In COMP4, item10 was the strongest indicator of this component; the coefficient of this item accounted for 0.76.

In COMP5, item13 was the strongest indicator of this component; the coefficient of this item accounted for 0.78.

We grouped items associated to each component in table 1.

Table 1: items representing each component

The first component (COMP1) is named as 'Intensity' which contains items:	$R^2$
1.1 the number of minutes a day spent on Facebook.com (item01)	0.35
1.2 the number of days a week spent on Facebook.com (item02)	0.26
1.2 number of friends on Facebook.com (item03)	0.29
The second component (COMP2) is named as 'Snoop' which contains items:	$R^2$
2.1 frequency of watching other people profiles (item04)	0.48
2.2 frequency of watching other people photos (item05)	0.77
2.3 frequency of reading other people posted messages (item06)	0.57
The third component (COMP3) is named as 'News' which contains items:	$R^2$
3.1 frequency of reading their Top News ( Most Resent) (item07)	0.77
3.2 frequency of reading News-Feed (item08)	0.66
The fourth component (COMP4) is named as 'Information Receiving' which contains items:	$R^2$
4.1 frequency of reading links sent from their friends (item09)	0.42
4.2 frequency of reading information sent from organizations or people selected as ' Like' (item10)	0.58
4.3 frequency of reading group messages (Item11)	0.33
The fifth component (COMP5) is named as 'Relationship Management' which contains items:	$R^2$
5.1 frequency of reducing friends (un-friend) (item12)	0.38
5.2 frequency of adding or reducing groups (item13)	0.66
5.3 frequency of creating their own group (item14)	0.48

The value of  $R^2$  in table 1 delineates the total variation of each component demonstrated through its question item. In table 2, the technology adoption (ADOP) was expressed through the five components, all of which had the value of  $R^2$  greater than 0.40; in other words, these components explained more than 40 % of the total variation of the adoption of Facebook.com.

Table 2: the technology adoption demonstrated through each component

The components of the technology adoption (Facebook.com)	R <sup>2</sup>
1. 'Intensity'	0.41
2. 'Snoop'	0.46
3. 'News'	0.48
4. 'Information Receiving'	0.74
5. 'Relationship Management'	0.49

## 5. Discussions

### 5.1. Theoretical Implications

The adoption of Facebook.com could explain through the five components based on grouped items in areas of Thai undergraduate students. This research shows that the adoption of Facebook.com can primary be measured through the features of 'Information Receiving' (R<sup>2</sup> =0.74 and coefficient= 0.86). The second important part of adoption was the set of 'Relationship Management' activities (R<sup>2</sup> =0.49 and coefficient= 0.70). The adoption of Facebook.com could also express through the set of 'News' activities (R<sup>2</sup> =0.48 and coefficient= 0.70) and the set of 'Snoop' activities (R<sup>2</sup> =0.46 and coefficient= 0.68). The adoption of Facebook.com could be measured least through the concept of 'Intensity' (R<sup>2</sup> =0.41 and coefficient= 0.64). This may be because the measurement concept of 'Intensity' was to measure the amount of time (minutes a day) spent on Facebook.com, the number of days a week spent on Facebook.com, and the number of friends on students' network, each of which was a real number; these items might be different from the items of the other four components. Items of 'Snoop', 'News', 'Information Receiving' and 'Relationship Management' were based on measurement of frequency of using activities (items) on Facebook.com which the data obtained from ordinal scales of frequency ranked as: very often, often, sometimes, rarely, and never use. Therefore, the pattern of this measurement ostensibly corresponded well with the concept of 'Snoop', 'News', 'Information Receiving' and 'Relationship Management'.

### 5.2. Managerial Implications

In terms of technology development, this research contains imperative details of information technology development that 'Information Receiving' was the key primary features of Facebook.com that the Thai students utilized. The second primary group of important features of Facebook.com was 'Relationship Management'. We felt a bit surprised that this function of Facebook.com should be the most important function instead of 'Information Receiving'. Perhaps once students obtain enough friends, they may reduce the use of the 'Relationship Management' features and turn to use the 'Information Receiving' features and other. However, further research should be studied. Other online social networks such as Hi5.com, Linkedin.com, and twitter.com consist of different features which motivate their members to use. It is worth to study key activities of other online social network sites and compare them together.

### 5.3. Limitations of This Research

First, the samples were Thai undergraduate students and this reason may limit the use of this research in other groups of people.

Second, there are other features that Facebook.com allows its users to use were not included in this study; then, there may be other components that did not found in this research.

Third, the research needs a cross validation to confirm the results with another group of samples.

### 5.4. Suggestions to Future Research

First, in development of measurement, question items should be included more than our items to investigate other components that may exist.

Second, future research should find out causal relationships of factors that are beneath the adoption of Facebook.com.

Third, comparison between or among online social networks may provide knowledge about how human use different technologies and understand developers of online social networks provide features to their members.

Fourth, we encourage the future research should investigate the online social network phenomena in deeper detail such as longitudinal studies. It is better to understand how features of online technology changes over a time period.

Fifth, the future research should aim to combine quantitative and qualitative studies together which may obtain better and profound understanding about a real world phenomenon. In our past research we were unsuccessful to measure the technology acceptance; we have found many limitations of a pure quantitative study that occurred from limitations of past research literature. The mixed methods approach may be a good research strategy to mitigate this problem.

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