Factors Affecting End-User Satisfaction on Facebook

Christopher Sibona and **Jae Hoon Choi**

University of Colorado Denver, The Business School, Denver, CO 80202

christopher.sibona@ucdenver.edu & jaehoon.choi@ucdenver.edu

Abstract

This study predicts end-user satisfaction on Facebook through two constructs: perceived ease-of-use and perceived usefulness. Usefulness was operationalized to reflect the perception that the site is helpful for friendship maintenance and social surveillance. The results show that Facebook users perceive the site to be both easy-to-use and useful. Perceived ease-of-use and perceived usefulness were statistically significant predictors for satisfaction; the perceived usefulness of the site has a greater impact on satisfaction than perceived ease-of-use. Several control variables were included to adjust the results. Satisfaction is statistically significantly higher for users who have more friends and interact with more people compared to those who had fewer friends and fewer interactions. Satisfaction is not statistically different for males and females when accounting for users' perception of usefulness and ease-of-use. This study applies the IS success model developed for more utilitarian systems to a hedonic social network site.

Introduction

Social network sites (SNS) are where Americans spend the largest share of their time online; Americans spend approximately 25% of their time online on SNS and blogs (Nielsen 2011). Facebook has over 800 million active users worldwide and has the largest SNS user population in the U.S. (Nielsen 2011).[1] While Facebook is a site where people spend considerable amounts of their online time it is not known how satisfied the users are or what makes them satisfied. We examine end-user satisfaction through two established constructs: perceived ease-of-use and perceived usefulness (Davis 1989). Perceived usefulness is operationalized in this study as how useful the site is for maintaining friendships and conducting social surveillance. Social network sites like Facebook allow users to accumulate social capital; however, the site appears to benefit weak-tie relationships more than strong-tie relationships (Ellison, Steinfield, and Lampe 2007; Vitak, Ellison, and Steinfield 2010). Relationship strength may vary from weak- to strong-ties, although there is some consensus that the majority of ties

[1]http://www.facebook.com/press/info.php?statistics

on Facebook are weak (Vitak, Ellison, and Steinfield 2010; Lewis and West 2009).

Although Facebook is a popular site in terms of the proportion of time spent online that fact alone does not indicate that the users are highly satisfied with the site, or believe it is either useful or easy-to-use. Facebook users may have a variety of motivations to use the site beyond these elements. SNS might feel compelled to use the site through social pressure or because they find it necessary to monitor their network. Joinson (2008) examined motivations for using Facebook and found that the users said that they wanted to "keep in touch" with others as their main motivations where other uses such as social surveillance, reconnecting with others, etc. were less common. The purpose of this research is to determine how the perceived ease-of-use and perceived usefulness of Facebook contribute to end-user satisfaction. There is strong evidence that Facebook, at the U.S. national level, is quite popular; however, this analysis is at the user-level and brings insight into the user-level attributes for satisfaction and specifically examines the hedonic web site of Facebook.

Literature Review

Technology adoption has been studied by information systems (IS) researchers for a variety of classes of applications such as work-related applications (health care, scheduling, etc.), general applications (email, telecommunication, etc.), and e-commerce applications (King and He 2006). The technology acceptance model (TAM) proposed by Davis(1989) is a widely used and influential research model to explain a user's behavioral intentions to use an information system (King and He 2006; Lee, Kozar, and Larsen 2003). TAM is based on the Fishbein and Azjen's (1975) Theory of Reasoned Action (TRA); TRA is an intention model that helps predict and explain behaviors across multiple domains including information system domains (Davis, Bagozzi, and Warshaw 1989).

Davis(1989) adapted TRA to explain IS acceptance through two constructs: perceived usefulness (PU) and perceived ease-of-use (PEOU) to explain system users' intention-to-use and adoption behavior. Davis(1989) (p.320) defined *perceived usefulness* as "the degree to which a person believes that using a particular system would enhance his or her job performance," and defined *perceived ease-of-*

use as "the degree to which a person believes that using a particular system would be free of effort." The initial research by Davis(1989) (p.320) was about adoption within organizational contexts; however; TAM has been used to predict acceptance in many IS domains outside the organizational context.

DeLone and McLean (1992; 2003) (D&M) examined IS success through six variables: system quality, information quality, use, user satisfaction, individual impact and organizational impact to determine what makes a given information system successful. The D&M model identified the relationships between the variables and cautioned that additional research was needed (Petter and McLean 2009). At the individual level, end-user satisfaction is a major component of IS success; the variable is one of the most widely used single measures of IS success (DeLone and McLean 1992). DeLone and McLean(2003) caution users of their model to select the dependent variable of success that is appropriate to the objectives and the context of the empirical investigation. The D&M 2003 model includes a feed back loop between *use* and *user satisfaction* because *use* necessarily precedes *user satisfaction* and greater *satisfaction* will increase *use*. As users increase use and satisfaction the user will accumulate net benefits (the 2003 success model redefined individual and organizational impacts as *net benefits*) and can help determine the success of an information system.

Study Design

Based on previous research, this investigation was designed to predict end-user satisfaction on the social network site Facebook with two constructs: perceived ease-of-use and perceived usefulness. Perceived usefulness has been operationalized in this case to mean friendship maintenance and social surveillance, which are two of the dominant motivations of Facebook users (Joinson 2008). This research uses the established theory from Davis's Technology Acceptance Model (Davis 1989) for two of the constructs, *perceived ease-of-use* and *perceived usefulness*, to predict *end-user satisfaction.* In this research the survey population already adopted Facebook; therefore, this research uses end-user satisfaction as the dependent variable. *Intention-to-use* and *system usage* have been shown in previous studies to be linked to end-user satisfaction (Petter and McLean 2009; DeLone and McLean 2003).

Based on the literature review and research question, this study proposes the following hypotheses to predict the relationship between perceived ease-of-use, perceived usefulness and end-user satisfaction:

H1: Perceived ease-of-use of Facebook increases the perceived usefulness of Facebook

H2: Perceived ease-of-use of Facebook increases the end-user satisfaction of Facebook

H3: Perceived usefulness of Facebook increases the end-user satisfaction of Facebook

The research was conducted using a survey to determine the survey respondent's opinions and behaviors about their satisfaction with Facebook. The survey used established questions from previous studies operationalized to predict Facebook end-user satisfaction. Demographic items were used as control variables in the analysis.

Survey recruitment was conducted by sending Twitter users who posted about Facebook a tweet that asked the user to take a survey about the site. The recruitment tweet was sent in a single tweet of 140 characters and provided enough information to the Twitter user to take the survey.

Surveys were collected between April 17th and September 15, 2010 for 151 total days. 7,327 recruitment tweets were sent during the time period. A total of 2,865 surveys were started and 1,552 were completed; 54% of those who started the survey completed the survey. The surveys were started by 39.6% of those who were sent tweets and completed by 21.3%.

Structural equation modeling (SEM) was used to analyze the data collected in the survey. SEM helps explain the relationship between multiple variables including latent (unobservable) factors in a single, systematic and comprehensive manner (Hair et al. 2006; Gerbing and Anderson 1988; Gefen, Straub, and Boudreau 2000). The analysis used a measurement model to assess goodness of fit for the overall model and factor analysis, construct validity and reliability (convergent and discriminant) for the latent constructs (Hair et al. 2006; Gefen, Straub, and Boudreau 2000). After the measurement model was validated, a structural model was generated to determine the path coefficients between the constructs and the associated error coefficients with the control variables included. This research uses two independent variables (*perceived ease-of-use* and *perceived usefulness*) to predict one dependent variable (*satisfaction*). Control variables for the research include: age, gender, whether the person lives in the United States, number of friends, number of friends with whom the person interacts, and years of social networking site use.

Results

The structural model was generated using the partial least squares (PLS) method, since it focuses on prediction of the constructs rather than explanation of the relationships between items (Hair et al. 2006). The latent factors were analyzed for convergent and discriminant validity by analyzing the factor loadings, average variance extracted (AVE), construct reliability (CR) and cross loading through correlation of constructs. Factor loadings for the items for the latent constructs PEOU, PU and SAT were all greater than .70 and indicate that the items converge on the latent construct at adequate levels (Hair et al. 2006). Correlation estimates were calculated between the constructs and the square root of the average variance extracted (AVE) for each construct. All of the square roots of the AVE are higher than the correlation estimates which support discriminant validity. Overall, these results support the discriminant validity of the model.

Figure 1 shows the path coefficients for the structural model. The model is assessed by the path coefficients and the coefficient of determination (R^2) values. All of the hypotheses were supported. PEOU's effect on PU is supported. PEOU's effect on SAT is also supported. Finally, PU's effect on SAT is supported. R^2 values measure the proportion
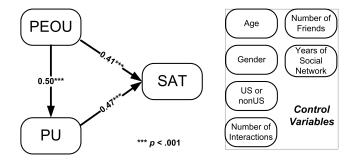
Figure 1: Model Path Coefficients & Control Variables

of the variance of the latent endogenous variable that is explained by the latent exogenous variables (Hair et al. 2006). The endogenous variables are SAT and PU, and the exogenous variables are PEOU and PU. The R^2 values show that SAT has the largest share of the variance explained through the factors ($R^2 = .65$), and PU the second ($R^2 = .34$), which are between substantial ($R^2 = .67$) and moderate ($R^2 = .33$) (Chin 1998). Table 1 summarizes the hypotheses supported and the effect of CVs.

Discussion & Conclusion

Social networking sites make up the largest share of time spent online in the U.S. according to Nielsen(2011). Popularity, by itself, does not indicate that the users have high or low end-user satisfaction or show how the two constructs, perceived usefulness and perceived ease-of-use contribute to satisfaction. Popularity at Nielsen(2011)'s level of analysis is at the macro-level, this research investigates the relationship of end-user satisfaction at the individual level.

The net benefits at the individual that may be accrued through Facebook use may be social capital. Social capital generally refers to the skills and knowledge that are accessible to an individual through their relationships with others (Coleman 1988).Coleman notes that an important form of social capital is the ability to acquire information through relationships; information itself may be valued highly and is generally costly to acquire. Access to a large and weakly-tied tied network may provide more benefits a smaller strongly-tied network (Granovetter 1973).Ellison, Steinfield, and Lampe(2007) found a strong positive relationship with Facebook use and bridging social capital. Facebook use was also found to increase levels of bonding and maintenance of social capital in the same study but at lower levels than bridging social capital.Vitak, Ellison, and Steinfield(2010) found that Facebook use had limited effects on bonding capital. Facebook users may believe that increased social capital is a net benefit of site use

The purpose of this research is to determine how the perceived ease-of-use and perceived usefulness of Facebook contribute to end-user satisfaction. This research uses TAM with age, gender, whether the person lives in the U.S., number of friends, number of friends with whom the person interacts, and years of social networking site use as control variables. Facebook users are satisfied with the site when they find it useful and easy to use. The first hypothesis, *H1*,

Hypothesis	Estimate	*t*-statstic
H1: PEOU → PU	0.50	19.16 ***
H2: PEOU → SAT	0.41	19.21 ***
H3: PU → SAT	0.47	22.38 ***
Age → PEOU	-0.15	5.69 ***
Age → PU	0.04	1.74
Age → SAT	0.03	1.75
Gender → PEOU	0.02	0.89
Gender → PU	0.06	2.91 **
Gender → SAT	0.00	0.19
U.S. vs. NonU.S. → PEOU	-0.01	0.36
U.S. vs. NonU.S. → PU	-0.05	2.18 *
U.S. vs. NonU.S. → SAT	-0.02	1.23
No. Friends → PEOU	0.14	4.16 ***
No. Friends → PU	0.09	3.00 **
No. Friends → SAT	0.06	3.19 **
No. Interactions → PEOU	0.18	6.37 ***
No. Interactions → PU	0.13	5.11 ***
No. Interactions → SAT	0.04	1.67
Yrs SNS Use → PEOU	-0.06	2.08 *
Yrs SNS Use → PU	0.01	0.59
Yrs SNS Use → SAT	-0.05	2.84 **

$* p < .05; ** p < .01; *** p < .001$

Table 1: Support for hypotheses and the effects of the control variables

posits that perceived ease-of-use of Facebook increases the perceived usefulness of Facebook, which is supported. The second hypothesis, *H2*, posits that perceived ease-of-use of Facebook increases the end-user satisfaction of Facebook, which is supported with the third hypothesis, *H3*, which posits that the perceived usefulness of Facebook increases end-user satisfaction with Facebook. These results coincide with previous TAM research used to predict acceptance in many IS domains, as stated in the literature review. The results are helpful in that hedonic websites like Facebook appear to share similar relationships that utilitarian websites have regarding end-user satisfaction.

Facebook users' satisfaction was impacted more by its usefulness than its ease of use, but both factors are important in predicting satisfaction. Usefulness has been operationalized in this research in terms of friendship maintenance and social surveillance based on previous studies (Joinson 2008). The usefulness found in this study has a good fit with Facebook's stated purpose where they state that the site "is a social utility that helps people communicate more efficiently

with their friends, family and coworkers."[2] Users who found Facebook easy-to-use had higher satisfaction with the site than those who found it difficult to use.

The results also show interesting effects of control variables on perceived ease-of-use, perceived usefulness, and satisfaction. Older users perceive the site to be more difficult to use than younger users. Younger users may be more familiar with the Internet, state-of-the-art IT technology, etc. than older users; however, age does not affect perceived usefulness or satisfaction on Facebook. Female users perceive Facebook to be more useful than male users. This result is similar to Gefen and Straub's (1997) study of women having higher perceived usefulness of email than men. However, unlike their result that men have higher perceived ease-of-use for email usage, gender does not effect perceived ease-of-use on Facebook. Gender does not effect satisfaction on Facebook either. U.S.-based Facebook users find the site to be more useful than those who live outside the U.S.; however, there are no differences in perceived ease-of-use or satisfaction based on location. The number of friends control variable is notable in that it effects all three constructs and is the only control variable to do so. When users have more friends, they have higher perceived ease-of-use, perceived usefulness, and satisfaction than users who have fewer friends. When users have more interactions, they have higher perceived ease-of-use and perceived usefulness than users who have fewer interactions. In general, increasing the number of interactions with users may lead the user to increased site use, which makes users feel more at ease with the site. However, number of friends with whom the person interacts does not effect satisfaction. Finally, when users have more years of SNS experience, they have higher perceived ease-of-use and satisfaction than users who have less experience. However, years of SNS use does not effect perceived usefulness.

Facebook users' satisfaction can be predicted by two constructs, perceived ease-of-use and perceived usefulness. This study successfully applies the traditional IS success model developed for more utilitarian purposes to a hedonic social network site.

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[2]http://www.facebook.com/press.php