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Professional Development
Grant Final Report 2015-2016
(Part II)

Management & Marketing Department
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PROFESSIONAL DEVELOPMENT GRANT

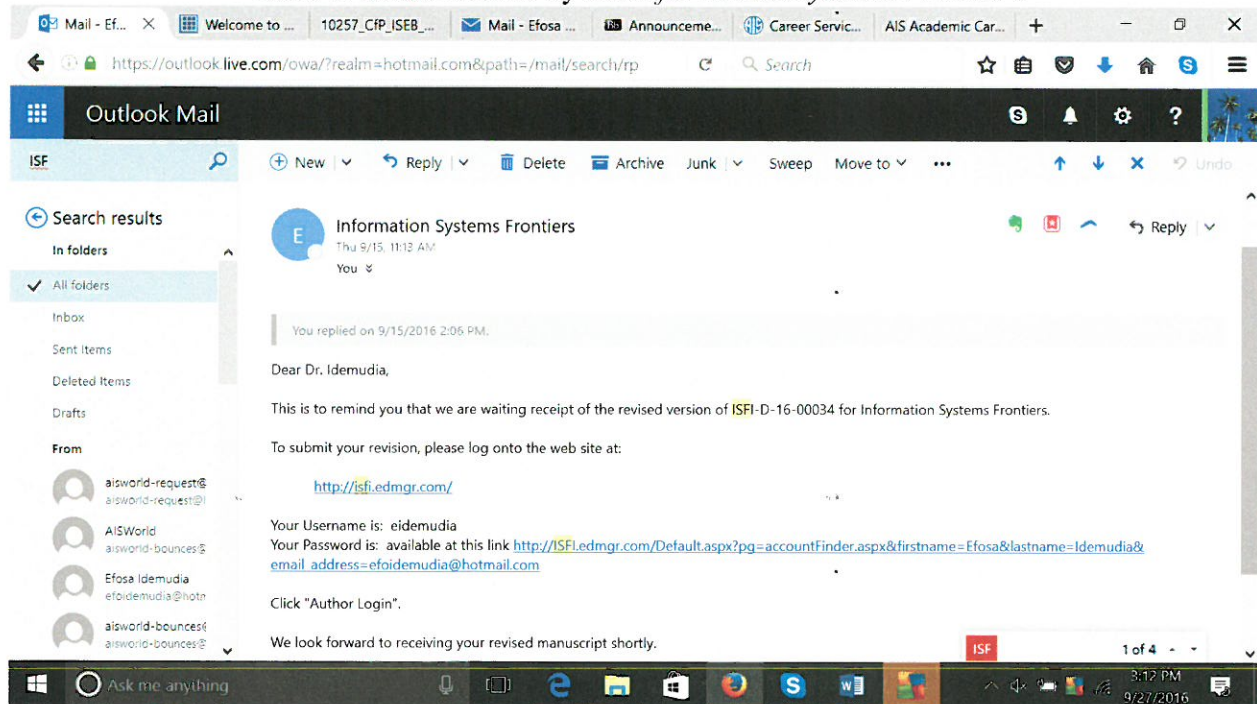
1. Professional Development Grants, Arkansas Tech University 2016, “An Empirical Investigation of Factors that Improve Employees’ Satisfaction in a Municipality Allowing the Use of BYOD”.

Arkansas Tech University approved my professional development grant for me to present my research paper in the “20th Annual Conference of the Southern Association for Information Systems (SAIS)”.

Attending the conference above gave me the opportunities to share ideas, knowledge, and skills with other professors worldwide; hence, these professors gave me excellent comments and feedback on how I can improve my research papers for journal publications. Thus, my research paper is under review in the *Information Systems Frontiers*).

Table 1 shows screenshot indicating that the manuscript is under reviews in the *Information Systems Frontiers*. Also, I attached the research paper in this report.

Table 1: Under review by the *Information Systems Frontiers*



An Empirical Investigation of Factors that Improve Employees' Satisfaction in a Municipality Allowing the Use of BYOD

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ABSTRACT

Municipalities all over the world are now encouraging employees to use Bring Your Own Device (BYOD) to perform their daily work tasks and activities to improve employee-self growth, employee self-advancement, job promotion, job security, job satisfaction, and employee performance. To the best of our knowledge, there are no published studies that have investigated factors that improve Employees' Satisfaction for Municipality that allows the use of BYOD. To fill the gap in the literature, we use the job characteristics model and the equitable needs fulfillment model to explain factors that improve employees' satisfaction when using BYOD. We also, present the research and practical implications.

Keywords

Municipalities, BYOD, job characteristics model, equitable needs fulfillment model, job satisfaction

INTRODUCTION

BYOD refers to 'bringing your own device' to use resources on the network wirelessly and refers to devices such as smart phones, tablets, and laptops. Resources on the network might include things like work email, municipal software and databases (incident reporting and management, code enforcement, recording work time, handling citizen complaints and other input, etc.), applications on an office desktop (word processing, spreadsheet, etc.), or resources on the Internet. BYOD makes the organization look flexible and mobile thus improving employee's satisfaction, morale, and convenience. Employees may be more comfortable working with organizations that have BYOD policies because employees are empowered to decide on the types and kind of mobile technology they want to use. Also, BYOD policies may give employees exclusive control of features they like to use to perform their daily job tasks and activities.

Employee satisfaction is critical to the successful implementation of BYOD in municipalities. Many studies in the information systems disciplines have identified the antecedents of employee satisfaction in organizations. Today, most organizations are encouraging employees to use BYOD. The main reasons why organizations are encouraging employees to use BYOD are employee self-growth, employee self-advancement, job promotion, work challenges, job security, employee satisfaction, employee performance, employee performance expectation, improvement of work efficiency, functional effectiveness, service quality, recognition and status, social relations, job satisfaction, and power and control. BYOD may offer employees and organizations significant benefits such as increased efficiency, cost control, improved communication, and an enhanced mobile workforce.

To date, the constant change in technology is one of the most significant organizational changes (Herold et al. 2007). To address these organizational changes most companies are encouraging employees to Bring Your Own Device (BYOD) to the work environment. To the best of our knowledge there is no study in the information systems discipline that have investigate the factors that improve employee' satisfaction for municipality that allows the use of BYOD. To fill the gap in the literature we will conduct our study. Focusing on the job characteristics model (JCM; Hackman and Oldham 1980) and the Equitable

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Needs Fulfillment Model (Au et al. 2008) we identify factors that improve employees' satisfaction in organizations that allow the use of BYOD.

JOB CHARACTERISTICS MODEL

The job characteristics model posits that job characteristics have significant impact on job satisfaction (Hackman and Oldham 1980; Morris and Venkatesh 2010). Various job characteristics together influence job satisfaction (Hackman and Oldham 1980). Morris and Venkatesh (2010) discuss that job characteristics consist of the following five constructs: task significance, task identity, skill variety, autonomy, and feedback. The definitions of the constructs are shown in Table 1.

Constructs	Definitions
Task Significance	“The extent to which a job has impact on the lives of people in an organization or society in general”(Morris and Venkatesh 2010; pp. 145)
Task Identity	“The extent to which a job involves completing a whole identifiable outcome” (Morris and Venkatesh 2010; pp. 145)
Skill Variety	“The extent to which a job requires the use of different talents” (Morris and Venkatesh 2010; pp. 145)
Autonomy	“The extent to which a job provides the employee with discretion to choose how the work is done and to set the schedule for completing the work activities” (Morris and Venkatesh 2010; pp. 145)
Feedback	“The extent to which carrying out the work activities provides the employee with clear information about his or her performance” (Morris and Venkatesh 2010; pp. 145)
Job Satisfaction	“The extent of positive emotional response to the job resulting from an employee’s appraisal of the job as fulfilling or congruent with the individual’s values” (Morris and Venkatesh 2010; pp. 145)

Table 1: Construct Definitions (Source: Morris and Venkatesh 2010)

Most organizations are encouraging employees to use BYOD in the work environment to improve job satisfaction and productivity. Some studies have shown that job satisfaction has a positive impact on organizational commitment, turnover intentions, and job performance (Griffeth et al. 2000; Singh et al. 1996; Tett and Meyer 1993; Thatcher et al. 2002). Ang and Slaughter (2000) argue that changes have a significant impact on job attitude. BYOD has the potential to significantly alter employees' job; and thus change employees' reactions to their daily work situations, tasks, and attitudes. Organizations are giving employees BYOD to enhance job flexibility, productivity, adaptability, and satisfaction with respect to the constant changes in technology. Some IS researchers and scholars have investigated the relationship between job characteristics and/or job satisfaction (Goldstein 1989; Morris and Venkatesh 2010; and Thatcher et al. 2002). Prior studies have provided little insight and consideration on how the relationship of job characteristic and job satisfaction using BYOD might play out in municipalities.

Morris and Venkatesh (2010) argue that job characteristics and job satisfaction are important factors that influence the adoption of Enterprise Resource Planning (ERP) systems. Job characteristics have an important impact on job outcomes and job satisfaction (Ang and Slaughter 2001; Morris and Venkatesh 2010; Thatcher et al. 2002). Favorably perceptions of job characteristics have a positive impact on motivation and job satisfaction (Singh 1998; Singh et al. 1994; Tyagi and Wotruba 1993). Job redesign or design can positively influence job satisfaction and job outcomes (Parker and Wall 1998). There is a linear relationship between employees' perceptions of job characteristics and job outcomes, such as job satisfaction (Farias and Varma 2000). Significant changes in job tasks and contexts that are caused by the constant changes in technology has a significant influence of job characteristics (Ang and Slaughter 2001; Boudreau and Robey 2005). Cavanaugh et al. (2000) argues that job redesign resulting from significant organizational changes might pose enormous challenges to some employees resulting in decreasing job outcomes and satisfactions. Boudreau and Robey (2005) discuss that using a new technology that involves complexity can be very frustrating and challenging. These challenges and frustrations are pronounced when employees are adapting to new technical skills and technologically redesigning employees' job tasks (Devadoss and Pan 2007; Kraemmerand et al. 2003). New task demands may lead to job stress and lower job satisfaction (Burke 2001; Konradt et al. 2003). The preceding discussion is summarized by the following propositions:

Proposition 1: Task Significance using BYOD has a positive influence on Job Satisfaction

Proposition 2: Skill Variety using BYOD has a positive influence on Job Satisfaction

Proposition 3: Autonomy using BYOD has a positive influence on Job Satisfaction

AN EQUITABLE NEEDS FULFILLMENT MODEL

The Equitable Needs Fulfillment Model posits that IS performance, IS performance expectations, relatedness fulfillment, performance fulfillment, and development fulfillment have a positive influence on end user IS satisfaction (Au et al. 2008).

BYOD Performance

Kroenke (2011) argues that the five components of information systems are hardware, software, data, procedure, and people. Au et al. (2008) define IS performance “as the perceived outcome from IS use” (pp. 46). Hence, in our study, we define BYOD performance as the perceived outcome of BYOD use. IS attributes can be classified into three groups: systems quality, information quality, and support services quality (Myers et al. 1997). There is a positive relationship between perceived performance of IS and satisfaction (Iivari 2005; and Tan and Lo 1990). Au et al. (2008) argue that performance level of IS has a positive impact on the level of user satisfaction. Hence, the preceding discussion is summarized by the following proposition:

Proposition 4: Performance of BYOD has a positive impact on employees' satisfaction for municipalities that allows the use of BYOD

BYOD Performance Expectation

Szajna and Scamell (1993) defined user expectations of IS as “a set of beliefs held by the targeted users of IS associated with the eventual performance of IS and with their performance using the system” (pp. 494). Thus we define BYOD performance expectation as the degree of beliefs held by employees within a municipality with the eventual performance of BYOD and with their performance using the BYOD. Predicted expectations have a positive impact on satisfaction (Tse and Wilton 1988). Mahmood et al. (2000) argue that when using expert systems that there is a significant strong positive correlation between expectations, improve performance, and satisfaction. Au et al. (2008) argue that IS performance expectations have a significant and positive effect on satisfaction. This leads to the next proposition:

Proposition 5: BYOD performance expectation has a positive impact on employees' satisfaction within municipalities.

BYOD Performance Fulfillment

Au et al. (2008) define work performance fulfillment as “the user needs that are fulfilled from using an IS at the workplace in carrying out assigned job duties” (pp. 47). Thus, we define BYOD performance fulfillment as employee needs that are fulfilled from using BYOD in the municipality in carrying out assigned job duties. Au et al. (2008) argue that performance fulfillment is the basic and fundamental need that information systems are expected to fulfill. Examples of performance fulfillment in the work environment are improved of work efficiency, functional effectiveness, and service quality (Laudon and Laudon 2000).

Au et al. (2008) define relatedness fulfillment as “all the social oriented needs of the user that require interactions with other human beings” (pp. 47). Examples of relatedness fulfillment are recognition and status, social relations, and power and control (Alter 1999). Thus, we define BYOD relatedness fulfillment as all social oriented needs of employees that require interactions with other employees. Au et al. (2008) argue that self-development fulfillment “focuses on the user higher-order needs, in terms of individual self-growth and self-advancement, that are brought about by using the information systems in areas such as job promotion, work challenges, and job security” (pp. 47). For employees to effectively use BYOD, they have to input data and information using the BYOD; such input includes cognitive effort, mental effort, physical effort, and time. Some of the input that may involve high cognitive and mental loads may negatively impact the use of BYOD. Au et al. (2008) argue that when perceived benefits are more than the input required to use the system then users will be satisfied using the system. We summarize the preceding discussion with the following propositions:

Proposition 6: BYOD performance fulfillment has a positive impact on employees' satisfaction within municipalities.

METHODOLOGY

In addition to reviewing the literature that might be relevant to this study, the researchers met several times with subject matter expert (a local municipal IT director) to identify issues that should be included. That discussion covered several topics, including security, employee productivity, ease of use, degree of expertise and comfort employees have with technology, compatibility and support for various BYOD platforms with existing software, and policies that are set by the mayor, department heads, and the IT department.

The researchers constructed a candidate questionnaire and met with the IT department head, who acted as the subject matter expert. The Feedback construct was removed based on this discussion. The questionnaire was revised several times. The final pilot questionnaire will be submitted for expedited review and approval by the University IRB.

The researchers will conduct interviews with the mayor and the department heads in a local municipality. The interview with the Mayor will include questions about BYOD on the following subjects: objectives and strategy, policies, concerns and problems, and budget associated with BYOD support. The mayor will also be asked whether the state municipal league offers any advice or support on this topic. The researchers also expect to gain formal permission and support to interview department heads and to survey employees (preliminary support has already been granted).

The department heads will be asked to fill out the questionnaire themselves and then respond with feedback on the questionnaire. This feedback will be used to further refine the questionnaire, if necessary. These interviews will also cover policies, concerns and problems, and budget associated with BYOD support. The researchers expect to strengthen department head support for the employee survey.

The IT department head will be asked additional technical questions about policy implementation, concerns and problems, and budget associated with BYOD management and support. The researchers will ask in particular about support and compatibility with respect to BYOD devices and operating systems, security measures in place, and level of use. The questionnaire responses involve self-reported data; the IT department head can provide specific, objective data on what devices are used, how much they are used, and what problems have actually occurred with their use. The IT department head may be able to estimate level of compliance with policies and procedures regarding BYOD use.

Qualitative analysis of interview data will look for common patterns, disagreements, new ideas, awareness of existing objectives, strategies, and policies, and level of congruence with theoretical models. If this analysis indicates a need, the questionnaire will be further refined.

The survey will be distributed to employees [on paper or via email link to electronic survey (survey monkey?)]. Participants will have two weeks in which to respond. A follow up email message reminder will be sent 7 days and 12 days to participants who have not yet responded.

The quantitative analysis of the survey responses will include descriptive statistics and analysis of variance based on department, job type, level of use, and demographic variables. The analysis will examine whether and to what degree those variables can predict level of BYOD use. The open-ended responses will be categorized and summarized.

FUTURE RESEARCH

The next step in this research is to interview the state municipal league director and appropriate staff with respect to advice, support, and impressions of BYOD use in individual municipalities around the state. These interviews will be followed by surveying league members with a questionnaire as shown in the Appendix at their annual conference. The employee questionnaire will be further revised, if necessary, and sent to employees of municipalities around the state that wish to participate in this study.

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APPENDIX

SURVEY

The purpose of this research is to investigate factors that improve employee satisfaction in a municipality that allows the use of devices other than a desktop computer in work tasks.

Instructions: Your thoughtful answers will provide important insight to our research. It is important for us that you answer all the questions to the best of your ability (i.e. please do not skip any questions).

Also, please note that:

1. All the information you give will be kept *strictly confidential*.
2. The questionnaire will take *no more than 15 minutes* of your time to complete.

BYOD refers to 'bringing your own device' to use resources on the network wirelessly and refers to devices such as smart phones, tablets, and laptops. Resources on the network might include things like work email, software applications (Word, Excel, New World, or other software applications on your office desktop computer or the network), or resources on the Internet.

Part A

Consider the BYOD device you use the most in your work tasks. Please circle the response that most closely represents your level of agreement with each statement.

Your perception about ease of use	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Does Not Apply
Learning to use my device at work was easy.	1	2	3	4	5	0
Using my device at work is easy.	1	2	3	4	5	0

Your perception about productivity	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Does Not Apply
I am more productive in my work when I use my device.	1	2	3	4	5	0
My device allows me to give a more timely response in my work.	1	2	3	4	5	0

Your perception about job satisfaction	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Does Not Apply
Overall, I am more satisfied with my job because I use my device.	1	2	3	4	5	0
My job becomes more important when I use my device.	1	2	3	4	5	0

Your perception about job transformation	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Does Not Apply
Using my device at work has changed my job significantly.	1	2	3	4	5	0
My work is very different since I started using my device.	1	2	3	4	5	0

Your perception about job significance	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Does Not Apply
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My job itself is more significant in the broader scheme of things because I use my device.	1	2	3	4	5	0
My job has more of an impact on other people because I use my device	1	2	3	4	5	0

Your perception about skill variety

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Does Not Apply
Using my device has required me to do many different things at work, using a wider variety of my skills and talents.	1	2	3	4	5	0

Your perception about autonomy

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Does Not Apply
Using my device gives me a chance to use my personal initiative and judgment in carrying out my work.	1	2	3	4	5	0

PART B

Finally, we would like to ask a few questions about you. (Please remember your answers are confidential.)

1. Have you ever used a device (smart phone, tablet, laptop, other) to connect to resources on the network for your job?
 Yes No

If you answered #2 'No', please skip to the Demographic questions below.

If you answered #2 'Yes', then please answer the questions #2 - #10 immediately below.

2. What types of devices do you use in your job? (Check all that apply.)
 smart phone: _____ (type: iPhone, Android, Blackberry, Microsoft, etc.)
 tablet: _____ (type: iPad, Galaxy, Surface, etc.)
 laptop _____ (type: Windows, MacOS, other)
 e-reader _____ (Type: Kindle Fire, Nook, etc.)
 other : please specify _____
3. On average, how many hours per week do you spend per week using your device?
 0 – 5 hours 31 – 35 hours 26 – 30 hours
 11 – 15 hours 6 – 10 hours 36 – 40 hours
 21 – 25 hours 16 – 20 hours More than 40 hours
4. Where do you use your device? (Check all that apply.)
 at home at work at school everywhere
5. Do you regularly use your device to communicate with other employees?
 never rarely sometimes often constantly
6. Was a device given to you to use in your job? Yes No
7. Have you ever purchased your own device to use in your job? Yes No
If 'Yes', how much have you spent in the last year in purchasing your own device(s)?
 \$1 to \$100 \$101 to \$500 more than \$500
8. Over the past 12 months, approximately how many times have you shopped for your device(s)?
 once or twice 5 – 10 times 3 – 5 times more than 10 times
9. Over the past 12 months, approximately how much do you spend personally on a data plan for your device for work?
 none \$1 to \$100 \$101 to \$500 more than \$500

Demographic Questions

1. In which department do you work? _____
2. What is your job title? _____
3. How long have you worked for this municipality?
 0-3 years 3-5 years 5-10 years 10-15 years 15-20 years more than 20 years
4. What is the highest level of education you have completed?
 High School/GED 1-3 years of college Bachelor's degree Graduate degree
 Other _____ (trade school, certifications, etc.)
5. What is your age (optional)?
 18-24 25-34 45-54 55-64 35-44 65-75
6. Please indicate your gender. Male Female

Thank you very much for your participation! If you wish to add any comments or further observations about BYOD at work, please use the space below.

The contributing factors of continuance usage of social media: An empirical analysis

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Abstract

This paper provides a theory to account for contributing factors of continuance usage of social media by building a structural equation model of factor covariance for the prediction of the continuance usage of social media. Due to the ubiquity and impact of social media on the behavioral or mental approaches in our lives, it is important to gain a deeper understanding of the causal factors such as relative advantage in terms of enhancement of performance, compatibility with tasks, perceived quality of information content, and risk of transaction disclosure. We identify the predictors of continuance usage using confirmatory factor analysis and model them using a structural equation model based on a theoretical background comprising of the technology acceptance model, diffusion of innovation theory, cognitive fit theory, and satisfaction theory. Our results present statistically significant hypotheses that suggest that web users and online visitors continue to use social media if they perceived it to be useful and easy to use, and are satisfied with their use experience. The usefulness is predicted by

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factors, which explains in part the reasons why organizations are using social media as both relative and competitive advantage to increase their customer base and improve marketing activities. The implications for theory and practice are discussed.

Keywords

Social media, continuance usage, ease of use, usefulness, satisfaction, compatibility, relative advantage, information quality, risk

Social media including applications such as Twitter, Facebook, Google+, and LinkedIn are ubiquitous. They affect how we socially interact on a daily basis. It is important that we gain more understanding of their acceptance, their level of use and the trajectory of their continuance usage for decision making and policy formulation. In our study, we address the problem of inability to estimate the contributions of factors of continuance usage of social media by building a structural equation model of factor covariance for the prediction of the continuance usage of social media.

Introduction

Social media is everywhere and it continues to play a critical role in socio-economic technology and political arena. Some popular social media sites include: Facebook, Twitter, Google Plus, YouTube, Pinterest, and LinkedIn. We use it communicate everywhere in private and in public. We interact and share contents using social media. Social media are being used to carry on business functions such as recruitment, research and investigations. It is being used to conduct training, to motivate attitude change, and to provide social support (Fogg, 2003). These sites are all continuously innovating ideas to attract online users and keep their current users interested. As a result, all social networks are not only transforming how we access our information, but are also influencing our behavior. Driven by the widespread diffusion and adoption of social media platforms such as Facebook and Twitter, as well as mobile devices, value co-creation from social media is emerging as an important field of research. Peres (2010) suggests that diffusion is "the process of the market penetration of new products and services that is driven by social influences, which include all interdependencies among consumers that affect various market players with or without their explicit knowledge".

Like any information system and technology, social media usage might dwindle or continued over time. The continuation or discontinuation of use or trajectory of continuance of use (Bhattacharjee, 2001) of social media has a critical implication for businesses and technology manufacturers and developers. Thus in our study, we aim at investigating the usefulness, ease of use and satisfaction predictors surrounding the technological acceptance of social media in order to predict its continual usage.

Social media is defined as "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user-generated content." (Kaplan and Haenlein, 2010). Social media consists of an online platform and tools that people use to share opinions and experiences, including documents, photos, videos, music, insights, and perceptions with each other (Turban et al., 2008). Social media depend on mobile and web-based technologies to create highly interactive platforms through which individuals and communities are able to share, co-create, discuss, and modify user-generated content. Kietzmann and Hermkens (2011) present a framework that defines social media by using seven functional building blocks: identity, conversations, sharing, presence, relationships, reputation, and groups.

Literature Review

This review covers the relevant research surrounding the technology acceptance theme of social media applications with the aim of laying the theoretical foundation of this study.

Theory

Social media are applications designed to allow people to share opinions and experiences together (Turban et al., 2008). Their designs follow information systems theories that describe the acquisition and representation of contents such as documents, photos, videos, music, insights, news and other materials of interest to the users. Shannon (1951) presents the information theory describe the organizing, processing and presentation in ways that achieve information gain and application functionality or usefulness. The cognitive fit theory (Vessey, 1991) and cognitive load theory (Sweller, 1988) state that the usefulness of an application is enhanced when the design of information representation methods and techniques is based on the characteristics of the target tasks with the goals of maximizing the fit between task and representation.

Users employ social media with the intent to achieve a sharing objective. Ajzen (1985) posits the theory of planned behavior which explains the effect of behavioral intention and change action. It states that the individual behavior is driven by behavioral intentions which are a function of an individual's attitude toward the behavior and subjective norms surrounding the performance of the behavior. This theory is a modification of the theory of reasoned action which is adapted by Davis (1986) to explain factors that drive technology acceptance in the technology acceptance model.

The technology acceptance model (TAM) proposed by Davis (1989), for various types of information systems and communication technologies, states that the perceived usefulness and perceived ease of use affects the individual's intention to use the application which subsequently help the decision to use the application (Davis et al., 1989; Venkatesh, et al., 2003). The criticisms of TAM as a "theory" include its questionable heuristic value, limited explanatory and predictive power, triviality, and lack of any practical value,(Chuttur, 2009; Benbasat and Barki, 2007). In an attempt to integrate the main competing user acceptance models, Venkatesh et al. (2003) formulated the Unified Theory of Acceptance and Use of Technology (UTAUT). This model is found to outperform each of the individual models (Adjusted R square of 69 percent) (Venkatesh et al. 2003). These perceived usefulness and perceived ease of use constructs are applied and validated in the context of social media development (Idemudia, 2014, Idemudia and Raisinghani 2014; and Venkatesh et al. 2003). In this study, we investigate how well the perceived usefulness and ease of use predictors might predict the continual use of social media as a criterion.

TAM is one of the most influential extensions of Ajzen and Fishbein's theory of reasoned action (TRA) in the literature and it replaces many of TRA's attitude measures with the two technology acceptance measures— *ease of use*, and *usefulness*. TRA and TAM, both of which have strong behavioral elements, assume that when someone forms an intention to act, that they will be free to act without limitation. In the real world, there will be many constraints, such as limited freedom to act (Bagozzi, Davis & Warshaw 1992).

Earlier research on the diffusion of innovations also suggest a prominent role for perceived ease of use. Potential adopters evaluate an innovation on its relative advantage (the perceived efficiencies gained by the innovation relative to current tools or procedures), its compatibility with the pre-existing system, its complexity or difficulty to learn, its trialability or testability, its potential for reinvention (using the tool for initially unintended purposes), and its observed effects (Rogers, 1962; 1983). One of the key elements in diffusion research relevant to this study is the social system such as social media. The social system is the combination of external influences (mass media, organizational or governmental mandates) and internal influences (strong and weak social relationships, distance from opinion leaders) (Strang & Soule, 1998). There are many roles in a social system, and their combination represents the total influences on a potential adopter (Rogers, 1962). However diffusion is difficult to quantify because humans and human networks are complex and it is extremely difficult, if not impossible, to measure what exactly causes adoption of an innovation (Damanpour, 1996). Diffusion theories can never account for all variables, and therefore might miss critical predictors of adoption, and the variety of variables has also led to inconsistent results in research, reducing heuristic value (Downs and Mohr, 1976; Plsek and Greenhalgh, 2001).

In complex environments such as social media where the adopter is receiving information from many sources and is returning feedback to the sender, a one-way information flow model from sender to receiver, is another weakness of the diffusion of innovation theory since it is insufficient and multiple communication flows need to be examined (Robertson, Swan, and Newell, 1996). Tornatzky and Klein (Tornatzky & Klein 1982) analyzed the adoption, finding that compatibility, relative advantage, and complexity had the most significant relationships with adoption across a broad range of innovation types. Eason studied perceived usefulness in terms of a fit between systems, tasks and job profiles, using the terms "task fit" to describe the metric (quoted in Stewart 1986) Legris, Ingham & Colletette 2003 suggest that TAM must be extended to include variables that account for change processes and that this could be achieved through adoption of the innovation model into TAM.

We found the continuance usage and satisfaction of social media constructs relevant to the issue of social media application acceptance from the work of Islam (2012). We introduce both constructs: continuance usage and satisfaction into the structural parts of the determination of the continuance use of social media. We expand the research question to include the interrelation of these constructs with that of the perceived usefulness and ease of predictors.

We found the relative advantage and compatibility factors from He et al. (2006) relevant to the theme of usefulness of social media as a mediating criterion. We also extract and include the perceived quality of social media constructs from Cheng (2013) and Xu et al. (2013) and perceived risk of social media from Kesharwani and Bisht (2011), Hanafizadeh and Khedmatgozar (2012), and Zheng et al. (2012) as predictors of the usefulness of social media. Based on these additional constructs, our main research question is refined to investigate how well the predictors such as relative advantage, task compatibility, perceived quality of information content, and risk of transaction disclosure through the mediating effect of usefulness factor together with ease of use and satisfaction experience predict the continuance usage of social media. We break it down into three sub research questions in the next section.

Research Questions

We decomposed our main research questions into the following sub questions:

- i. How well do predictors such as relative advantage, task compatibility, perceived quality of information content, and risk of transaction disclosure predict the usefulness experience of social media for problem solving?
- ii. Subsequently, how well do ease of use, satisfaction experience and usefulness experience predictors predict the continuance usage of social media?
- iii. How well do relative advantage, task compatibility, perceived quality of information content, and risk of transaction disclosure factors through the mediating effect of usefulness factor predict the continuance usage of social media?

Hypotheses

Dang et al. (2012) evaluate an exemplar instance of a solution called nano mapper in their study of information overload problem using search efficiency and effectiveness metrics namely system ease of use, usefulness, and satisfaction. The metric ease of use refers to a perception that a system is relatively free of effort (Davis, 1989). We adapt this metric as a construct and hypothesize that:

The ease of use perception of social media will have a positive impact on its continuance usage (Hypothesis 1).

Usefulness is the perceived degree to which a system enhances performance (Venkatesh, Morris, Davis, & Davis, 2003). With our participant population, we hypothesize that:

The usefulness experience of social media for problem will have a positive impact on its continuance usage of social media (Hypothesis 2).

Prior research has identified satisfaction as a key determinant of behavioral intention or attitude (Bhattacharjee, 2001; Brown & Venkatesh, 2005; Karahanna, Straub, & Chervany, 1999). We consider satisfaction also as an important influence on the intent to use and continual usage of web related systems such as social media. Thus we hypothesize that:

The satisfaction experience will have a positive impact on the continuance usage of social media (Hypothesis 3).

Usefulness is a key construct and may be decomposed further into its predictors. He et al. (2006) include the construct relative advantage as a key influencing predictor of the system usefulness. We adapt it as a predictor of usefulness for our student population and hypothesize that:

The relative advantage in terms of providing study aids that contribute to good academic performance, will have a positive impact on the usefulness experience of social media for problem solving (Hypothesis 4).

For improved productivity, it is expected that a system that is used as a tool to accomplish a task, as recommended by the cognitive fit theory (Vessey, 1991) and cognitive overload theory (Sweller, 1988), should be designed to maximize the fit between task and representation of information and to minimize the cognitive load of processing the information (Zhu & Watts, 2010). Fitness to task or compatibility to task should allow the users to perform better (Speier & Morris, 2003) and contribute positively the overall productivity. With respect to our participant population in this study, we therefore hypothesize that:

Social media compatibility with the academic tasks and perceived nominal quality of information content will have a positive and statistically significant impact on the usefulness experience of social media for problem solving (Hypothesis 5).

Fitness to task is an ingredient of a quality system. Quality of systems or information is related to usefulness and satisfaction (DeLone & McLean, 2003; Cheng, 2013; Xu et al., 2013; Kesharwani and Bisht, 2011). A well-designed system that consistently produces accurate results is likely to be more useful. Thus we formulate the quality hypothesis as follows:

The perceived nominal quality of information content of social media will have a positive impact on its usefulness experience (Hypothesis 6).

Having considered that quality systems are more likely to be complete and consistent, producing accurate information, the risk of compromise of such information abound. The perceived risk of social media is operationalized as a predictor in the studies conducted by Kesharwani and Bisht (2011), Hanafizadeh and Khedmatgozar (2012), and Zheng et al. (2012). We adapt this construct also as a predictor of usefulness of social media for problem solving. Then we hypothesize that:

The risk of transaction disclosure in social media will have a positive impact on the usefulness experience of social media for problem solving (Hypothesis 7).

Following the argument of hypotheses 1 through to 7, we hypothesize that:

The usefulness of social media for problem solving will mediate the effects of factors such as the relative advantage in terms of providing study aids that contribute to good academic performance, compatibility with the academic tasks, perceived nominal quality of information content, and risk of transaction disclosure on the continuance usage of social media (Hypothesis 8).

The list below shows the complete set of the developed hypotheses.

H1. The ease of use perception of social media will have a positive impact on its continuance usage.

H2. The usefulness experience of social media for problem will have a positive impact on its continuance usage of social media.

H3. The satisfaction experience will have a positive impact on the continuance usage of social media.

H4. The relative advantage in terms of providing study aids that contribute to good academic performance, will have a positive impact on the usefulness experience of social media for problem solving.

H5. Social media compatibility with the academic tasks and perceived nominal quality of information content will have a positive and statistically significant impact on the usefulness experience of social media for problem solving.

H6. The perceived nominal quality of information content of social media will have a positive impact on its usefulness experience.

H7. The risk of transaction disclosure in social media will have a positive impact on the usefulness experience of social media for problem solving.

H8. The usefulness of social media for problem solving will mediate the effects of factors such as the relative advantage in terms of providing study aids that contribute to good academic performance, compatibility with the academic tasks, perceived nominal quality of information content, and risk of transaction disclosure on the continuance usage of social media.

The next section discusses the formulation of the measurement model together with the structural model showing the covariate structure of all the constructs.

Measurement Model

The measurement model in figure 1 shows the measurement part of the predictors of the continuance usage measured by the intent to continue to use and other measures.

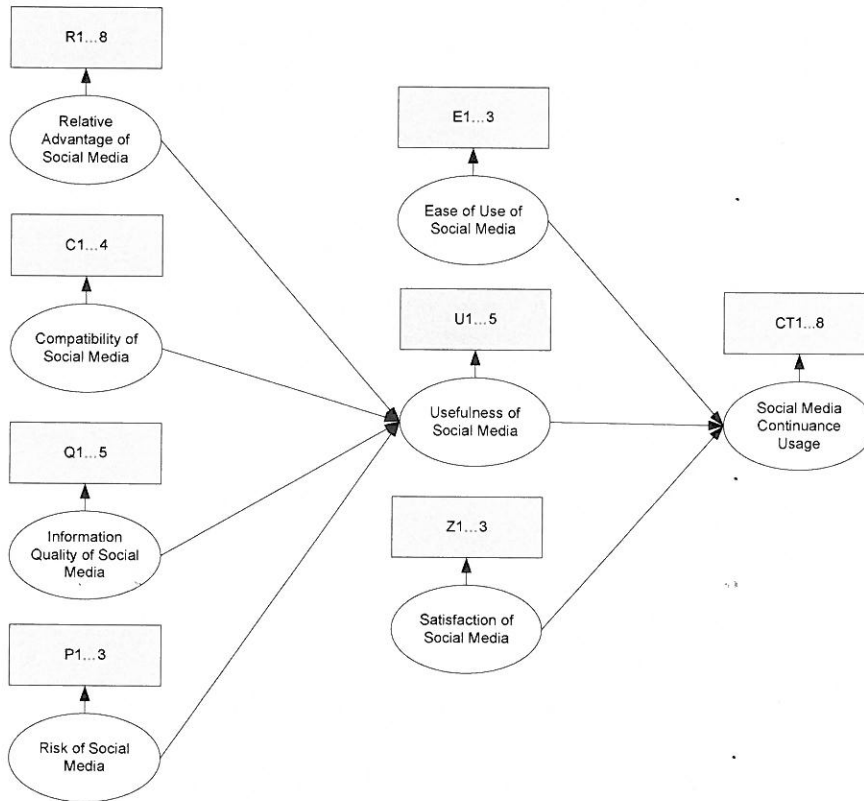


Figure 1. The measurement model.

Measurement legend: CT1...8 are eight measures of the continuance usage of social media, R1...8 are eight measures of the relative advantage in terms of aid for academic performance, C1...4 are four measures of the compatibility with the academic tasks, Q1...5 are five measures of the perceived nominal quality of information content, U1...5 are five measures of the usefulness experience for problem solving, E1...3 are three measures of the ease of use, Z1...3 are three measures of the satisfaction experience and , P1...3 are three measures of the risk of transaction disclosure.

Structural Model

The figure 2 illustrates the structural part of the latent variables the predictors of the continuance usage.

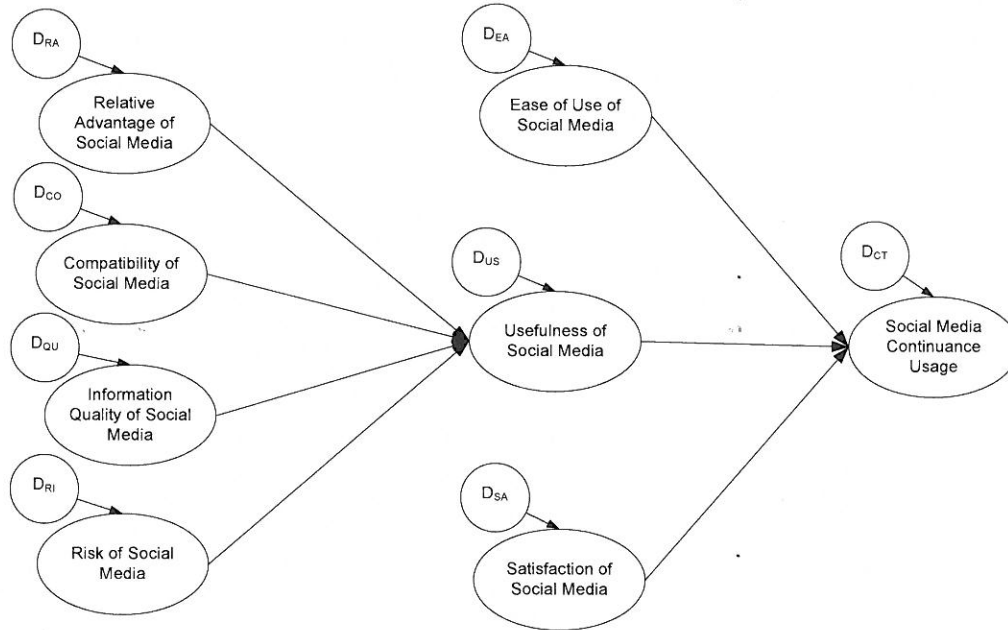


Figure 2. The structural parts showing the latent factors of the structural equation model.

Error disturbance legend: DCT for error in Social media Continance Usage; DRA for error in Relative advantage of social media; DCO for error in Compatibility of social media; DQU for Information quality of social media; DUS for error in Usefulness of social media; DEA for error in Ease of use of social media; DSA for error in Satisfaction of social media; DRI for error in Risk of social media.

Research Method

Participants and Data Collection Procedures

The research method we used in our study is a survey methodology for two main reasons: (1) it is the most widely accepted methodology for a wide range of technology acceptance research is questionnaire-based survey (Wu 2012); and (2) the survey methodology has been consistently ranked highest by researchers and scholars on methods use to investigate socio-psychological factors that influence the acceptance of a wide range of information systems platforms (Wu 2012). The datasets for our study were collected from 140 students that are enrolled in a large public university located in North America. The characteristics of participants that participated in our study are shown in *Table 1*. To enhance both external and internal validity, we make sure that the participants in our study use social media in their daily activities, assignments, and group projects. Thus, our participants are social media users and familiar with most of the features and functions using different kinds or type of social media that exist.

Some of the main reasons we recruited college students as subjects in our study are: (1) college students are using social media in their daily activities and to successfully complete tasks, assignments, and group projects; (2) in the future, college students are going to have significant influence in the online domains (Idemudia 2014); College students experience using computers, software, hardware, and technology reduces the inconsistency relating to computer literacy, knowledge, understandability, and usage compared to the rest of the population (Idemudia 2014); and (4) a lot of online firms are now targeting college students because the future of the internet market segments depend on college students (Davis 1999; Klopping and McKinney 2004; Lin and Lu 2000; Moon and Kim 2001); finally, (5) a lot of researchers and scholars have shown in their studies that using college students to investigate a wide range of information platforms is common and appropriate (Change and Cheung 2001; Davis 1999; Idemudia 2014; Idemudia and Raisinghani . 2014; Komiak and Benbasat 2006; Lin and Lu 2000; Moon and Kim 2001).

Have you ever used social media (Yes, No)	Yes = 142 No = 0
Have you used social media to complete any tasks/assignments/works? (Yes, No)	Yes = 107 No = 35
Have you ever used social media in your daily communication such as texting, camera, music etc? (Yes, No)	Yes = 140 No = 2
On average, how many hours do you spend per week using social media?	Mean = 11.6 Std. = 11
Do you regularly use social media to communicating with coworkers, families, and friends? (Yes, No)	Yes = 128 No = 14
Age	Mean = 21 Median = 20 Std. = 3.7
Gender	Female = 65 (46%) Male = 77 (54%)
Graduate or Undergraduate	Undergraduate = 142 (100%)

Note: The sample size is 142.

Table 1. Participants' Characteristics

In our study, we controlled for cognitive and common method biases by implementing the two main classical approaches recommended by Podsakoff et al. (2003). The two main classical approaches are (1) procedure and (2) statistical remedies for self-reported data (Podsakoff et al. 2003). The procedure approach we implemented to controlled for common and cognitive biases include the following steps: (1) we developed the questionnaire for our study separately from the research; (2) we eliminated all indicators and measures that are common and that helps subjects to know the relationship among all the variables; (3) the datasets for our study was collected multiple times at different locations, classrooms, times, date; (4) the research coordinator ensured that all subjects and participants' answers to the questionnaires were unidentified and anonymous; and finally, (5) before administering the questionnaire to subjects in our study, we conducted pilot test to eliminate any ambiguity and enhance clarity in the instructions and wording of measurement items in the survey/questionnaire. The second approach proposed (i.e. statistical remedies for self-reported data) by Podsakoff et al. (2003) is discussed in the data analysis relating to convergent and discriminant validity.

The procedure for administering the questionnaires/survey in our study is as follows:

- (1) Hardcopies of the surveys were distributed to all subjects/participants in our study.
- (2) The research moderator/instructors read printed instructions aloud to all subjects in our study.
- (3) All subjects in our study were asked to read the survey questions in both sections A and B very carefully; and to complete and answer all questions in the survey to the best of their knowledge and ability.
- (4) The instructors or research moderator who moderated the collection/completion of the questionnaire ensured that all subjects in our study answered all questions to the best of their knowledge and ability.
- (5) The time spent by most subjects in our study to complete hardcopies of the questionnaire was approximately 20 minutes.

The Operationalization of Constructs and Measurement Scales

In our study and to be consistent with most studies in the information systems disciplines, we used pre-validated measurement items from prior studies/literature as shown in *Table 2*; and we reworded the contents of prior studies' questionnaires to match our constructs and measurement items as appropriate. Continuance usage and satisfaction of social media were each measured using seven point

Likert scaled items that were developed and validated by (Islam, 2012). Perceived usefulness and perceived ease of use of social media were each measured using the seven point Likert scaled items that were developed and validated by Davis (1989), Davis et al. (1989), Idemudia 2014, Idemudia and Raisinghani 2014; and Venkatesh et al. (2003). Relative advantage and compatibility were adapted from He et al. (2006). Perceived Quality of social media was adapted from Cheng (2013) and Xu et al. (2013). Perceived risk of social media was adapted from Kesharwani and Bisht (2011), Hanafizadeh and Khedmatgozar (2012), and Zheng et al. (2012).

Construct	Measure	Source
CT: Social media continuance usage	(CT1) I will keep on using social media in the future.	Islam 2012
	(CT2) I intend to continue using social media rather than discontinue its use.	
	(CT3) My intentions are to continue using social media than use any alternative means.	
	(CT4) Using a social media is worthwhile.	
	(CT7) I intend to use social media over the next year.	
	(CT8) I intend to return to social media again.	
RA: Relative advantage of social media	(R1) Using a social media enables me to accomplish tasks more quickly.	He et al. (2006)
	(R2) Using a social media improves the quality of work/assignments I do.	
	(R3) Using a social media makes it easier to do my academic jobs/assignments.	
	(R4) Using a social media improve my academic jobs/assignments performance.	
	(R5) Overall, I find using a social media to be advantageous in my academic jobs/assignments.	
	(R6) Using a social media enhances my effectiveness on the academic jobs/assignments.	
	(R7) Using a social media gives me a greater control over my academic jobs/assignments.	
	(R8) Using a social media increases my productivity.	
CO: Compatibility of social media	(C1) Using a social media is compatible with all aspects of my academic jobs/assignments.	He et al. (2006)
	(C2) Using a social media is completely compatible with my current situation.	
	(C3) I think that using a social media fits well with the way I like to work when completing my academic jobs/assignments.	
	(C4) Using a social media fits into my work style.	
QU: Information quality of social media	(Q1) Overall, I would give the information provided in social media high marks.	Xu et al. (2013)
	(Q2) Overall, I would give the information provided in social media a high rating in terms of quality.	
	(Q3) In general, social media provide me with high quality information.	
US: Usefulness of social media	(U1) Using social media improved my decision-making abilities when doing the task.	Islam 2012, Davis (1989), Davis et al. (1989), Venkatesh et al. (2003)
	(U2) Social media allowed me to understand the task problem more quickly	
	(U3) Overall, using the social media is advantageous.	
	(U4) Using social media enhanced my problem-solving behavior for the task.	

	(U5) I found social media useful.	
EA: Ease of use of social media	(E1) Overall, I believe a Social media is easy to use.	Islam 2012, Davis (1989), Davis et al. (1989), Venkatesh et al. (2003)
	(E2) I believe that it is easy to get a Social Media to do what I want it to do.	
	(E3) Learning to operate Social Media is easy for me.	
SA: Satisfaction of social media	(Z1) My overall experience of using social media is very satisfied.	Islam 2012
	(Z2) My overall experience of using social media is very pleased.	
	(Z3) My overall experience of using social media is absolutely delighted.	
RI: Risk of social media	(P1) Information about my transactions may be tampered by others.	Zhang et al. 2012
	(P2) I fear that the PIN codes get lost and end up in wrong hands.	
	(P3) Information about my transactions may be known to others.	

Table 2. Constructs and Measures

Data Analysis

We implemented and followed the two-step approach that was recommended by Anderson and Garbing (1988) to assess construct validity, model fits, and to test for hypotheses in our study. The two-step approach recommended by Anderson and Garbing (1988) are: (1) measurement model and (2) structural model. Both the measurement and structural model in our study have constructs and measurement items that satisfy construct validity (i.e., convergent and discriminant validity). In the first step approach, measurement model, we used confirmatory factor analysis. To demonstrate convergent validity in the first step, measurement model, we used CFA to assessed item reliability, item loadings, composite reliability, construct validity, and error variance. In the second step, structural model, we modified the constructs in the measurement model to theoretical fit our research model and to show the causal relationship between the constructs (i.e. latent variables). Bagozzi and Phillip (1982) argue that CFA is most appropriate if the confirmatory research employs pre-validated measurement scales. Hence, we used CFA in the first step, measurement model. Also, we used CFA in the second step, structural model to test for hypotheses, to measure the R-Square, and to investigate the significant and strengths of each individual path in our research model. It should be noted that Anderson and Garbing (1988) argue that the two-step approach is a comprehensive and robust test for measuring construct validity, R-Square, paths significant/strengths, and hypotheses testing. Hence, in our study, we favor this two-step data analysis approach compared to the one-step approach.

Scale Validation and Measurement Model

In our study, we used confirmatory factor analysis (CFA) to assess the scale validity and the fit of the measurement model. Also, in our study, the two sequential phases for the validation of the scale are: (1) convergent validity and (2) discriminant validity. The three conditions we used to assess convergent validity is shown in *Table 3*. The three conditions are, first, the CFA loadings indicate that all scale and measurement items are significant and exceed the minimum value criterion of 0.70. Second, as shown in *Tables 3 and 4*, each construct composite reliability exceeds 0.80. Third, each construct's average variance extracted estimate (AVE) exceeds 0.50. Thus, our study indicates that most of the conditions for convergent validity as suggested and recommended by Fornell and Larcker (1981) and Bagozzi and Yi (1988) are met.

Construct and Indicators	Loading	Indicator Reliability	Error Variance	Reliability	Variance Extracted Estimate (AVE)
Social media continuance usage (FA1)				0.9038 ^c	0.6135
CT1	0.8980	0.8064	0.1936	0.8064	
CT2	0.8994	0.8089	0.1911	0.8089	
CT3	0.6983	0.4876	0.5124	0.4876	
CT4	0.6843	0.4682	0.5317	0.4682	
CT7	0.7786	0.6062	0.3938	0.6062	
CT8	0.7097	0.5037	0.4963	0.5037	
Relative advantage of social media (FA2)				0.9751 ^c	0.8306
R1	0.8132	0.6613	0.3387	0.6613	
R2	0.9229	0.8517	0.1483	0.8517	
R3	0.9272	0.8597	0.1403	0.8597	
R4	0.9403	0.8842	0.1158	0.8842	
R5	0.9361	0.8763	0.1237	0.8763	
R6	0.9379	0.8797	0.1203	0.8797	
R7	0.9289	0.8629	0.1371	0.8629	
R8	0.8770	0.7691	0.2309	0.7691	
Compatibility of social media (FA3)				0.9191 ^c	0.7404
C1	0.7882	0.6213	0.3787	0.6213	
C2	0.8265	0.6831	0.3169	0.6831	
C3	0.9224	0.8508	0.1492	0.8508	
C4	0.8980	0.8064	0.1936	0.8064	
Information quality of social media (FA5)				0.9010 ^c	0.7527
Q1	0.8645	0.7474	0.2526	0.7474	
Q2	0.9246	0.8549	0.1451	0.8549	
Q3	0.8099	0.6559	0.3441	0.6559	
Usefulness of social media (FA6)				0.9134 ^c	0.7263
U1	0.8300	0.6889	0.3111	0.6889	
U2	0.9132	0.8339	0.1661	0.8339	
U4	0.9066	0.8219	0.1781	0.8219	
U5	0.7487	0.5606	0.4395	0.5606	
Ease of use of social media (FA7)				0.9038 ^c	0.7581
E1	0.8817	0.7774	0.2226	0.7774	
E2	0.8526	0.7269	0.2731	0.7269	
E3	0.8775	0.7700	0.2300	0.7700	

Satisfaction of social media (F12)				0.9501 ^c	0.8642
Z1	0.9321	0.8688	0.1312	0.8688	
Z2	0.9828	0.9659	0.0341	0.9659	
Z3	0.8705	0.7578	0.2422	0.7578	
Risk of social media (FA13)				0.8855 ^c	0.7206
P1	0.8498	0.7222	0.2778	0.7222	
P2	0.8197	0.6719	0.3281	0.6719	
P3	0.8762	0.7677	0.2323	0.7677	

Note: ^c Denote composite reliability. All loading in Table 3 are significant at $p < 0.0001$.

Table 3. Constructs, Indicators, Reliability, Error Variance, & Variance Extracted

Construct	Composite Reliability	AVE
Social media continuance usage	0.9038	0.6135
Relative advantage of social media	0.9751	0.8306
Compatibility of social media	0.9191	0.7404
Information quality of social media	0.9010	0.7527
Usefulness of social media	0.9134	0.7263
Ease of use of social media	0.9038	0.7581
Satisfaction of social media	0.9501	0.8642
Risk of social media	0.8855	0.7206

Table 4. Construct Reliability and AVE

Also, in our study, we used the criterion that was recommendation from Fornell and Larcker (1981) to assess discriminant validity. Fornell and Larcker (1981) argue that for discriminant validity to be met, the square root of AVE for each construct should surpass the correlation of that construct and any other constructs. Table 5, shows that the highest correlation between a particular construct and any other construct is 0.7668; thus, this value is lower compared to the lowest square root of average variance extracted estimate (AVE) of all the constructs, which rests at 0.7843.

	CT	RA	Co	QU	US	EA	SA	RI
CT	0.7833	0.2774	0.4568	0.4148	0.3670	0.4798	0.6277	0.0047
RA		0.9114	0.7439	0.5462	0.7206	0.0281	0.3913	0.0583
CO			0.8605	0.5671	0.7467	0.1893	0.5389	0.1001
QU				0.8676	0.6913	0.2255	0.5023	0.1483
US					0.8523	0.1060	0.4794	0.1725
EA						0.8707	0.4482	0.0303
SA							0.9296	-0.0727
RI								0.8489

Note: The diagonal values represent the square root of the average variance extracted (AVE) of the specific construct. Construct legend: CT: Social media Continuance Usage; RA: Relative advantage of social media; CO: Compatibility of social media; QU: Information quality of social media; US: Usefulness of social media; EA: Ease of use of social media; SA: Satisfaction of social media; RI: Risk of social media.

Table 5. AVE and Correlations Among Latent Constructs

Hypotheses Testing and Structural Model

In our study, for the second step, we used CFA analysis to examine the R-square score of each endogenous variable, the explanatory power of each path in the model (Figure 2), each path significant and strengths. It should be noted that for our data analysis, we used structural equation modeling (SEM) because it can be used to analyze all paths in the model as one analysis (Chin 1998). Table 6 shows model-

fit measures that we used to assess the structural equation modeling's overall goodness of fit based on commonly accepted levels recommended by prior research (Chau and Hu 2001).

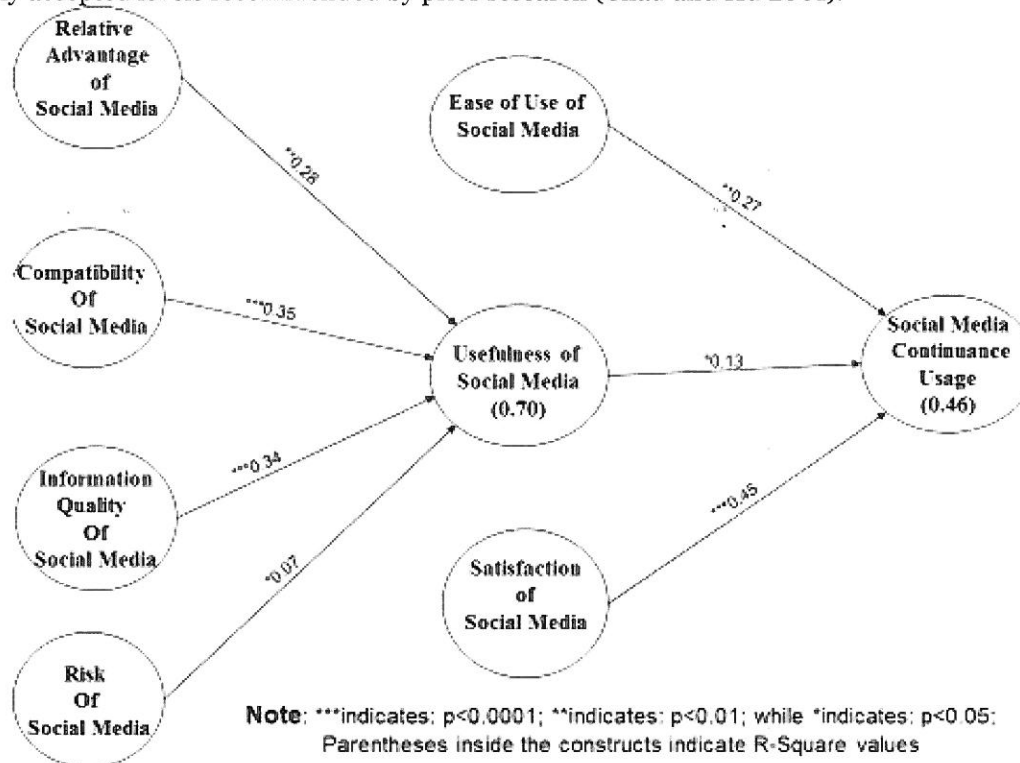


Figure 3. SEM Analysis with Path Coefficient and R-square

Goodness of Fit	SEMs value	Recommended values
Chi-square / degree of freedom	1.76	≤ 3.00
Non-Normed Fit Index (NNFI)	0.919	≥ 0.90
Comparative Fit Index (CFI)	0.918	≥ 0.90
Root Mean Square of Approximation (RMSEA)	0.083	≤ 0.10

Table 6. SEMs Overall Goodness of Fit

Discussion

To the best of our knowledge, there have been no published studies that investigate the influence of predictors such as relative advantage, compatibility, information quality, and risk on the usefulness, and social media continuance usage. Motivated by this lack of research, we developed our research model to empirically explain factors that affect social media continuance usage. SEM analysis, as shown in Figure 3, indicates that ease of use, usefulness, and satisfaction of social media explain 46 percent of social media continuance usage. This is consistent with prior studies in the information systems, psychology, and marketing disciplines that show that perceived usefulness, ease of use, and satisfactions can be used to explain the intention and continuous use of a wide variety of information platforms (Davis 1989; 1993; Davis et al. 1989; Gefen et al. 2003, Hu et al. 2013; Idemudia et al. 2013, 2014; Venkatesh et al. 2012). Relative advantage, compatibility, information quality, and risk of social media explain 70 percent of the usefulness of social media

The effect of the ease of use of social media on its continuance usage (H1) is 0.27 and is significant at the two-tailed 0.01 level. The effect of the usefulness of social media on its continuance usage (H2) is 0.17 and is significant at 0.05 level. The effect of the satisfaction; experience of social media on its continuance usage (H3) is 0.45 and is significant at 0.0001 level. These hypotheses (i.e. H1, H2, and H3)

suggest that web users and online visitors continue to use social media if they perceived the social media to produce satisfaction or enhance job productivity or perceived the social media to be useful and easy to use during communication and networking. Thus, the construct 'perceived usefulness' relies on using social media to enhance job productivity and performances relating to communication and networks to find solutions to problems. These findings relating to the technology acceptance model is consistent with most studies in the information systems, psychology, and marketing disciplines that have investigated factors that influence the behavioral intention to use or continuous use of a wide range of information systems (Davis 1989; 1993; Davis et al. 1989; Idemudia et al. 2013, 2014; Venkatesh et al. 2012).

The effect of the relative advantage factor on the perceived usefulness of social media (H4) is 0.28 and is significant at the two-tailed 0.01 level. One possible reason for the present of significant effect may be that web users and online visitors are perceiving social media as a relative advantage because they are now using social media and networks to improve their performance to find solutions to problems for their daily or difficult tasks. Also, companies and firms are now using social media as both relative and competitive advantage to increase their customer base, loyalty, satisfaction, and marketing activities.

The effect of the compatibility factor on the perceived usefulness of social media (H5) is 0.35 and is significant at the 0.0001 level. Compatibility reduces cognitive/mental loads and thus improves the decision-making process relating to finding solutions to daily difficult problems or tasks.

Information quality effect on the perceived usefulness of social media (H6) is 0.34 and is significant at the 0.0001 level. A lot of studies in the information systems, psychology, marketing, and communication disciplines have shown that social media improve the quality of information relating to networking, communication, and finding solutions relating to jobs' problems and daily activities or tasks.

The effect of the perceived risk factor on the perceived usefulness of social media (H7) is 0.07 and is significant at the 0.05 level. Knowing all the risks that are associated with social media are perceived to be useful to both web users and online visitors. This is similar to prior studies in the information systems, psychology, economics, and computer science disciplines that show that web users and online visitors use and adopt a wide range of ecommerce technology and information systems platforms if they perceive the presence of adequate security and privacy (Hoffman et al. 1999; Warrington et al. 2000; Yadav and Dong 2014).

The composite effect of the predictors: relative advantage in terms of providing study aids that contribute to better performance, compatibility with tasks, perceived nominal quality of information content, and risk of transaction disclosure (H8) has a positive and significant effect on the continuance usage of social media, via all direct and indirect causal links between these variables, demonstrating a mediator effect. This finding is consistent with the system continuance (Bhattacharjee, 2001) and the wide acceptance of ecommerce technology and information systems platforms (Hoffman et al. 1999; Vijayarathy 2003; Warrington et al. 2000; Yadav and Dong 2014).

Implications for Practice and Research

Our study opens the door for future researchers and scholars to investigate the specific factors that influence the continuous use of different kinds or types of social media that exist. Also, it has important implications for practice and research, especially within the context of social media and online networking. First, online firms and companies are investing billions of dollars to advertise products and services using social media with the intention of increasing online purchasing and improve customers' satisfaction. Such investment are wasted, if however, advertising using social media are not able to generate sales, revenue, profit, and income. Thus, these online firms and companies can benefit greatly if they know the critical factors and predictors or antecedents that influence the continuous use of social media. Some of the antecedents that influence the continuous use of social media are relative advantage, compatibility, information quality, and risk. As a result, online firms and companies should strive to ensure that their social media and networking sites are perceived by web users and online visitors to be easy to use, useful, and providing satisfaction experience.

Second, our study complements the mathematical modeling approach by providing critical factors on important variables to consider when collecting online data using cookies. Some of the important variables to consider from cookie data are ease of use, usefulness, satisfaction, relative advantage, compatibility, information quality, and risk. These critical variables might or might not depend on the mathematical approach. Hence, our study encourages and motivates future scholars to conduct additional research that could help clarify these relationships.

Third, our research model indicates that we only investigate 47 percent of all the factors that influence the continuous use of social media. Hence, our study encourages future researchers to investigate other critical factors that are not in our model. Additional future research could help explain these phenomena and gaps in the literature.

Conclusion

It is important to understand that the predictors may change over time and one has to take cognizance of this trend. This may be due to the change in technology (i.e., hardware/software/networks) and/or user behavior. An example of how the predictors can be put to use by the audience for continuance usage is to reflect on how millennials, have fallen out of love with Facebook for exactly the same reason they fell in love with it, i.e., its unapologetic ubiquity. It is not that the usage of Facebook by young people has declined — 87 percent of online adults 18 to 29 use Facebook, according to a Pew Research poll — but rather that its utility has evolved. Millennials post less now and about less trivial things. Snapchat lets millennials broadcast their lives only to people that they care about, and allows users to see who viewed their snaps and send snaps for up to 10 seconds, after which they disappear. Snapchat avoids the traps of Facebook and **Facebook-owned** Instagram by keeping private lives private — a social network that isn't too social (Seth, 2016).

The key takeaways are that social media are proving to be rich and ever-changing arenas for communication. From small, close internet communities to vast online dialogues like Facebook or Second Life, the potential for interconnectivity and dialogue increases almost daily. Today's apps or platform may be superseded by the next new platform to spring up. While some platforms and apps are being brought into bigger competitors by acquisition, new apps spring up as rapidly as others disappear. As the apps proliferate, so too do the uses for such apps. Location-based services, mobile marketing, blogs, social sites, tweets, and virtual worlds have all carved out places for themselves and a home in the human psyche. We are all taking part in a huge experiment in social interaction but we do not know where it will go, or what form an interaction will take, a motivation for our study. There is no doubt that social media has made its way into professional and personal organizations and intends to stay, perhaps not in the same form that we see it today, but the connections forged by social media will develop and evolve into greater places and better ways to do things as stakeholders pay attention to those predictors.

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