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

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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						
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						
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						
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						
Your perception about job significance	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Does Not Apply

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.