ACCETANCE AND USE OF THE “DIGITAL MEASURES” SYSTEM IN AN ORGANIZED ANARCHY

Research-in-Progress

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Abstract

The literature reveals that researchers have examined the adoption of different types of systems, both voluntary and mandatory, by different groups of individuals affiliated with different types of organizations. Adoption studies may exhibit the following characteristics: a) the research participants are drawn from multiple levels of the organization’s hierarchy, and b) the research participants attach similar interpretations regarding the adoption of the information system. It is not inconceivable that individuals within the same group attach different interpretations of voluntariness to the same information system. This may be applicable in Colleges and Universities in which faculty, in particular, comprise an “organized anarchy”. Taking the case of “Activity Insight”, a commercially-available software product (hereafter referred to as Digital Measures) meant for employees in colleges and universities to report their activities. This study provides a scenario for research on whether interpretations regarding voluntariness may result in findings that stray from the norm.

Keywords:  Digital Measures, Acceptance, Usage, Organized Anarchy, Information System.
Introduction

Much research has been undertaken on the adoption and continued usage of information systems and software. An examination of the literature reveals that researchers have examined the adoption of different types of systems, both voluntary and mandatory, by different groups of individuals affiliated with different types of organizations. In general, such studies may exhibit the following characteristics: a) the research participants are drawn from multiple levels of the organization’s hierarchy (i.e., executives, managers, and frontline employees may participate in the study), and b) the research participants attach similar interpretations regarding the adoption of the information system (i.e., the system is perceived as voluntary OR mandatory by all research participants in a single study).

However, it is not inconceivable that individuals within the same group attach different interpretations of voluntariness to the same information system, i.e., some individuals may consider the information system to be completely voluntary whereas some other individuals may perceive the same system to be completely mandatory, even within the same organizational context and even when use of the information system is mandated. This may be applicable in Colleges and Universities in which faculty, in particular, comprise an “organized anarchy” (Cohen et al. 1972); although organizations have goals and strive for accomplishments, these goals may not be embraced universally by all members throughout the organization.

Taking the case of “Activity Insight”, a commercially-available software product (hereafter referred to as Digital Measures) meant for employees in colleges and universities to report their activities, we seek to understand the following research questions: How do individuals perceive the Digital Measures system? What are the ways in which individuals use the Digital Measures system? What are the factors that enable or inhibit the acceptance and use of the Digital Measures system? Thus, this study provides a unique scenario for research on whether different interpretations regarding voluntariness may result in findings that stray from the norm established by other studies in the technology adoption area of research.

Literature Review

The adoption and use of information systems by individuals have received considerable research attention over time. Researchers have examined intention to adopt (Karahanna et al., 1999), adoption (Keil et al., 1995), acceptance (Chau, 1996), intention to use (Venkatesh and Davis, 2000), and usage (Szajna, 1996; Moon and Kim, 2001). A variety of information systems such as decision support systems (Sanders and Courtney, 1985), executive information systems (Bergeron et al., 1995), software packages (Venkatesh and Davis, 1996), database management systems (Grover and Teng, 1992), email (Szajna, 1996), operating systems (Karahanna et al., 1999), group support systems (Chin and Gopal, 1995), personal computers (Igbaria et al., 1997), expert systems (Guimaraes et al., 1996), knowledge management systems (Bock et al. 2008), human resources management systems (Venkatesh and Goyal, 2010), and enterprise systems (Saeed et al. 2010) in organizational settings have been examined in prior literature.

These studies have employed different classes of antecedents. These include innovation attributes such as perceived usefulness, perceived ease of use, relative advantage, complexity, compatibility, trialability, observability, and system quality (Davis, 1989; DeLone and McLean, 1992; Rogers, 1995; Sabherwal et al. 2006); individual characteristics such as playfulness, innovativeness, self-efficacy, and attitudes (Agarwal and Prasad, 1997; Compeau and Higgins, 1995; Taylor and Todd, 1995; Webster and Martocchio, 1992; Yi et al. 2006; Venkatesh and Bala 2008); task characteristics such as newness, difficulty, variety, routineness, and interdependence (Igbaria, 1990; Guimaraes et al., 1992; Raymond and Bergeron, 1992; Sanders and Courtney, 1985; Lin and Hu 2008; Lankton et al. 2010); and contextual factors such as top management support, facilitating conditions, voluntariness, organizational norms, and task-fit (Agarwal and Prasad, 1997; Igbaria et al., 1995; Karahanna et al., 1999; Goodhue and Thompson, 1995; Venkatesh et al., 2003; Orlikowski 1996; Lin and Huang 2008; Sykes et al. 2009). Studies have also proposed that the effects of antecedents on the adoption and use of information systems would be moderated by other factors such as gender, age, and experience (e.g., Venkatesh et al., 2003).
Research Model

Figure 1 shows the research model examined in the study. Three groups of antecedents, namely, technology attributes, individual dispositions, and organizational factors, are included in the research model as affecting system usage. In addition, the research model includes multiple moderators that are likely to alter the effects of antecedents.

System usage: The dependent variable is system usage, conceptualized in three ways: frequency of use (i.e., the number of times per day an individual uses the information system), time of use (i.e., the number of minutes per session an individual uses the information system), and intensity of use (i.e., the number of features of the information system used by individual) (Igbaria et al., 1989; Igbaria et al. 1995; Karahanna et al., 2006; Venkatesh et al. 2008). Also, adoption may be defined as a binary variable as necessary.

Technology attributes: Technology attributes represent characteristics of the information system, typically as individuals’ subjective interpretations rather than the objective capabilities. We examine three attributes in this research: usefulness, ease of use, and usability (Davis, 1989; Venkatesh and Bala, 2008). All three constructs are expected to exert a positive influence on frequency of use and intensity of use whereas ease of use and usability are expected to exert a negative influence on time of use.

Individual dispositions: Individual dispositions describe individuals’ personal characteristics that may influence their interactions with an information system. Two attributes are examined in this research: self-efficacy and enjoyment (Compeau and Higgins, 1995; Venkatesh and Bala, 2008). Both self-efficacy and enjoyment are expected to exert a positive influence on frequency of use and intensity of use whereas self-efficacy is likely to exert a negative influence on time of use.

Organizational factors: Organizational factors refer to characteristics of the environment in which the individuals are situated. We examine two organizational factors, namely, facilitating conditions and subjective norms (Sabherwal et al., 2006; Venkatesh and Davis, 2000). Both facilitating conditions and
subjective norms are expected to have positive influences on frequency of use and intensity of use whereas facilitating conditions is expected to have a negative impact on time of use.

**Moderators:** The moderating variables (Gender, Age, Education, Tenure, and Voluntariness) are included in our research model, as we expect that our results may differ from the norm of measures found in the technology adoption literature. These variables, then, may allow us to determine the extent to which they may be appropriate in settings such as organizational anarchies that provide the context for our study. While we expect that respondents will have a graduate degree, the majority of respondents may indicate that they have earned a Ph.D. The level of individual education may have an impact on the self-efficacy (Individual dispositions) as it relates to usage. Likewise, Tenure may alter the effect of independent variables on usage. Many faculty, especially those who are tenured in their position, may balk at the notion of being told to use a software package. In such cases, faculty may resort to having an assistant enter the data for them. In a similar vein, faculty may disagree over whether or not a “mandate” to utilize the software has been issued. Further, faculty with an administrative role may utilize the system more than faculty without an administrative role. Thus, the research model presented indicates that we expect moderating effects on each of the independent variable constructs.

Thus, the research model incorporates antecedents from prior theories including the Technology Acceptance Model (TAM, Davis 1989), Theory of Planned Behavior (TPB, Ajzen 1991), Technology Acceptance Model 3 (TAM3, Venkatesh and Bala 2008), and the Unified Theory of Acceptance and Use of Technology (UTAUT, Venkatesh et al. 2003). The research model also includes several moderators from UTAUT and other moderators developed newly for this study.

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<th>Table 1. Study Constructs</th>
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<td><strong>Construct</strong></td>
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<td>Frequency of use</td>
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### Methodology

#### Context

Cohen, March and Olsen liken universities to an organizational form which they define as organized anarchy (Cohen et al., 1972). Of particular interest to our research is what the researchers describe as fluid participation, in that “participants vary in the amount of time and effort they devote to different domains; involvement varies from one time to another” (Cohen et al., 1972, p. 1). In the context of adhering to (or, perhaps “obeying”) a mandate to utilize a particular software package for information input, faculty may be one group which may decline to participate. Hence, the organization may need to establish alternate means of securing the required information inputs, such as the availability of an office assistant to input faculty information into the required software system.

In this research, we examine the adoption of a software product called Activity Insight, created and licensed through the Digital Measures company ([www.digitalmeasures.com](http://www.digitalmeasures.com)). The Digital Measures system is a software product used to maintain information about an individual’s educational and professional accomplishments, essentially, items on an individual’s curriculum vitae. According to the vendor, more than 2000 schools and colleges across 25 countries use the Digital Measures software. The website notes that “[prior to using the software] ‘... our clients went back to their faculty six to twelve times a year asking for information for annual activity reports, promotion and tenure, accreditation, reports to external constituents, and more’” ([www.digitalmeasures.com](http://www.digitalmeasures.com), 02/20/2012). Usage of this software, the website claims, enables faculty to input information once; the entered data can then be pulled into various reports on an as-needed basis.

The researchers’ home College adopted the software in preparation for its AACSB reaccreditation reporting purposes. The College advises and even mandates its faculty to use the Digital Measures system (in some cases, a weekly report of individuals who had not entered their data, or who had errors in their data as entered, was sent to department chairpersons); however, not all faculty members chose to use or actually use the Digital Measures system. Anecdotal evidence suggested that the Digital Measures system did not seem to offer productivity gains to the faculty or offer a pleasing experience when using it. Thus, our personal experiences and anecdotal notes from our colleagues reveal that the acceptance and use of the Digital Measures system has been somewhat rocky.

#### Data Collection

In order to answer our research questions, a cross-sectional research design is employed. The study gathers data through a self-administered survey instrument from individual faculty members on their use of the Digital Measures system. These individuals may be located in an educational institution in the USA that has instituted the Digital Measures system.

Our research includes a preliminary, pilot, study, as well as a follow-up data collection, currently in progress. The pilot study involved data collection from our colleagues within our home College. A paper copy of the survey was distributed to each of the 65 faculty members within the College. Three weeks after the initial distribution took place, a reminder email was sent to all faculty members, requesting and
encouraging their participation. Twenty faculty members returned completed, usable surveys, for a response rate of 31%.

The first round of data collection is currently taking place. Using information on the Digital Measures company web site, the researchers identified three universities which utilize the software. The researchers obtained information concerning the College of Business faculty taking advantage of the common practice at many universities of compiling a College directory—specifically, we obtained the names and email addresses of the faculty members within the College of Business at each university. In a very few instances, we were unable to locate an email address for a faculty member. In this case, that faculty member was eliminated from our target respondent pool. We collected 194 names and email addresses from one university, 267 names and email addresses from a second university, and 145 names and email addresses from a third university. The combination of the three universities provides us with a potential respondent pool of 606 faculty members. Potential participants were sent an email message directing them to a web link. The web link displays the consent form, which is followed by the survey instrument if they choose to participate in the research. In testing the survey software, the researchers found that participants were provided: a) the consent form, which explains the research and solicits their participation, and b) the survey instrument, which requires reporting data anonymously.

A second round of data collection is planned and will be underway soon. Three other universitites are randomly chosen based on information available on the Digital Measures company web site. The contact information, specifically, the name and the postal mailing address, for the faculty members in the College of Business at each university are to be gathered. Paper copies of the survey instrument a postage-paid business-reply envelope will be mailed to potential participants in this sample. The second data collection phase is planned to mitigate potential response bias in the first data collection phase; specifically, it may be that faculty more tuned to email are more likely to adopt online systems such as Digital Measures.

Since the survey is anonymous, we propose that individuals completing the survey instrument have consented to participate in the research, and we do not require individuals to explicitly sign the consent form. The data gathered will be entered into an electronic worksheet, which will then be examined using standard data analysis techniques.

Looking Ahead

The proposed research has the potential to yield several benefits. First, findings allow for a broader understanding of the ways in which individuals accept and use software products that may be mandated by the administration but perceived very differently by actual users. Second, findings may enable software vendors to develop products that are robust, user-friendly, and appropriate for the target population of individuals who will use such products. Finally, findings may allow adopting organizations to design and implement strategies to facilitate individuals to accept and use such products with ease.

References


*MIS Quarterly* (19:2) 1995, pp 189-211.


Appendix – Survey Instrument

Choose an option below that best describes your use of the ‘Digital Measures’ system.

_____ I use the Digital Measures system myself
_____ I have my assistant use the Digital Measures system for me
_____ I do not use the Digital Measures system myself or through my assistant

How long have you been using the Digital Measures system? ____________ (months/ years)

Choose an option below that best describes the need to use the Digital Measures system in your department/ college/ university.

_____ Use is completely mandatory
_____ Use is mandatory but not enforced
_____ Use is optional but recommended
_____ Use is completely optional

How frequently do you use the Digital Measures system? ____________ (day/ week/ month/ quarter/ year)

About how long do you use the Digital Measures system each time you use it? ______ minutes per session

Check all types of information you typically enter into the Digital Measures system.

_____ Research publications _____ Presentations _____ Research grants
_____ Editorial activities _____ Review activities _____ General service activities
_____ Faculty narratives _____ Certifications _____ Consulting activities
_____ Honors and awards _____ Memberships _____ Professional development

Other ____________________ Other ____________________ Other ____________________

Check all types of reports you typically obtain from the Digital Measures system for yourself or for submission to the department/ college/ university.

_____ AACSB Vita _____ Vita _____ Faculty activity report
_____ Presentations _____ General service _____ Intellectual contributions

Other ____________________ Other ____________________ Other ____________________

Rate each item below as 1 (strongly disagree), 2 (disagree), 3 (neutral), 4 (agree), to 5 (strongly agree):

The Digital Measures system is easy to use
I am satisfied with the Digital Measures system
The Digital Measures system increases my productivity
I am concerned that my information could be misused
I am experienced in using different technologies
I can use online documentation if I need help with the Digital Measures system
The Digital Measures system offers a better way to complete my tasks
I have observed others using the Digital Measures system
Using the Digital Measures system is fun
My peers think I should use the Digital Measures system
The Digital Measures system is intuitive to use
The Digital Measures system is clear and understandable
I am satisfied with the capabilities of the Digital Measures system
The Digital Measures system helps me to be effective and efficient
I am concerned that my information could be used in ways I did not imagine
I can use new technologies even when no one is around to help me
I have access to a technical expert if I need help with the Digital Measures system
The Digital Measures system allows me to complete my tasks much faster
I have had several others show me the Digital Measures system
Using the Digital Measures system is enjoyable
My colleagues think I should use the Digital Measures system
The Digital Measures system is understandable
The Digital Measures system is simple to use
I am satisfied with the features of the Digital Measures system
The Digital Measures system enables me to accomplish tasks quickly
I am concerned about what others might do with my information
I feel confident about using new technologies
I can seek my colleagues if I need help with the Digital Measures system
The Digital Measures system offers a superior way to complete my tasks
I have seen demos of how to use the Digital Measures system
Using the Digital Measures system is pleasant
My superiors think I should use the Digital Measures system
The Digital Measures system is user friendly
Do you intend to continue using the Digital Measures system in the near future?  ____ No  ____ Yes
Gender:  ____ Male  ____ Female
Age group:  ____ <30  ____ 31–40  ____ 41–50  ____ 51–60  ____ >60
Status:  ____ Full-time faculty  ____ Part-time faculty  ____ Administrator
Highest degree earned:  ____ PhD  ____ Masters  ____ Other ________________
Years served as faculty:  ____ <5  ____ 6–10  ____ 10–20  ____ >20