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TOOLS MATTER: INVESTIGATING A LINK BETWEEN MEANS EFFICACY, ORGANIZATIONAL COMMITMENT, AND INTENTION TO QUIT OF INFORMATION SYSTEM AND INFORMATION TECHNOLOGY PROFESSIONALS

Kevin McReynolds, LDS Business College

Information systems (IS) and information technology (IT) professionals have lower than average organizational commitment and higher turnover rates than other professionals. This study explores the impact on IS/IT professionals of means efficacy and the effectiveness of tools on organizational commitment and intention to quit. The results of a survey (n=148) indicate that means efficacy is an antecedent or predictor variable to organizational commitment and that means efficacy might be considered an additional component of organizational commitment for tool dependent professions. These findings are supported by other studies showing that strong attachments to technology artifacts or other products impact behavior. The implication for practice suggests the need for awareness that, as systems age and become viewed as less effective, organizational commitment of IS/IT professionals might be impacted and IS/IT turnover accelerated; turnover drives up the cost of IT projects.

INTRODUCTION

Information systems (IS) and information technology (IT) professionals have lower organizational commitment and higher turnover rates (Joseph, Kok-Yee, Koh, & Ang, 2007; Moore & Love, 2005; Tu, Ragunathan, & Ragunathan, 2001); scholars and practitioners find these organizational behavioral phenomena among such professionals significant because the literature has validated organizational commitment as a predictor variable for turnover (Allen & Meyer, 1990; Sumner, Yager, & Franke, 2005). Replacement of such skilled professionals represents a significant cost to organizations (Mattila, 2006). In the literature, few antecedents for organizational commitment among IS/IT professionals, and no organizational commitment antecedents or relationships have been found between the technology artifact and organizational commitment (Bashir & Ramay, 2008; King, Xia, Quick, & Sethi, 2005; Paré & Tremblay, 2007; Thatcher, Stepina, & Boyle, 2002). This study, then, explores the concept that “Tools Matter” to IT/IS professionals and impacts their commitment to their organization. The genesis for “Tools Matter” is an individual’s strong attachment to certain brands or products.

Attachment to artifacts has been established by marketing scholars (Bradley, Maxian, Laubacher, & Baker, 2007; Sprott, Czellar, & Spangenberg, 2009; Thomson, MacInnis, & Park, 2005; Schouten & McAlexander, 1995). The discussion of these studies presents attachment to a product or artifact as a more accurate predictor of behavior than standard demographics. This exploratory study seeks to confirm a model where an IT professional’s attachment to technology (measured using means efficacy) acts a predictor variable for organizational commitment and its outcome variable, intention to quit. The impact of means efficacy on organizational commitment and intention to quit represents the “so what” of this study and will add to the body of knowledge by expanding organizational commitment to

include tools. The “Tools Matter” model is presented in Figure 1 and this model will be explored through a survey instrument and correlation and path analysis of the data. Confirmation of this model will establish technology artifacts as impacting IS/IT professional organizational commitment.

The rest of this paper will present a literature review, the model, and sections outlining the hypothesis, methods, instruments, results, discussion and implications for practice.

MODEL DEVELOPMENT AND LITERATURE REVIEW

The literature stream that suggests attachment as a possible predictor variable for organizational commitment was primary developed by marketing scholars. The seminal work was a three-year ethnographic study of Harley Davidson motorcycle owners (Schouten & McAlexander, 1995). Schouten and McAlexander argued that product use and attachment is a more meaningful predictor of purchase behavior than age, income, or education; for example, individuals attached to Harley Davidson motorcycles purchase certain other Harley Davidson products.

Other scholars confirmed the impact of brand attachment to purchase behavior and opinions for off road vehicles and German automobiles (McAlexander, Schouten, & Koenig, 2002; Algesheimer, Dholakia, & Herrmann, 2005). For example, these owners attend and participate in real world and online communities. Similar attachment studies were found for technology products and these studies provide a clear reason to tie the organizational commitment of IS/IT professionals to product attachments.

Some consumers have been found to have very strong attachments to Apple products (the defunct PDA, Newton, and Mac Personal Computer) (Belk & Tumbat, 2005; Muniz & Schau, 2006). Users of these Apple products display a clear preference for them (in-group) and a strong dislike for

competitor (out-group) products. The in-group preference was found to be very strong with other users of technology products.

A 2006 study of online postings to forums devoted to video cards (ATI and NVidia) showed a strong link between attachment and purchase behavior (Thompson & Sinha, 2008); this study examined over 900,000 messages from 7,506 distinct users and found that technology adoption rates were correlated with message posts. Labeling the other technology as inferior was also common in forums. It is this “inferior” or efficacy labeling that allows means efficacy to be used in this “Tools Matter” model.

MEANS EFFICACY

Means efficacy represents the IS/IT professional’s subjective beliefs or feelings (Tools Matter) about the quality of tools, resources, and personnel needed to complete a task, and has been described as the professional’s belief in the calibration of equipment (Eden, 2001; Eden, Ganzach, Flumin-Granat, & Zigman, 2008). Means or external efficacy is a separate construct from self- or internal efficacy (Bandura, 1997; Walumbwa, Avolio, & Zhu, 2008). Means efficacy has been established as a phenomenon in two studies.

In two field experiments, workers who rated their tools as having a higher efficacy rating had quicker processing times with fewer errors (Eden et al., 2008). Means efficacy was also shown to have a relationship with workers’

perceptions of their work unit, supervisor, and leadership (Walumbwa et al., 2008). The application of means efficacy to organizational commitment is supported by these two studies.

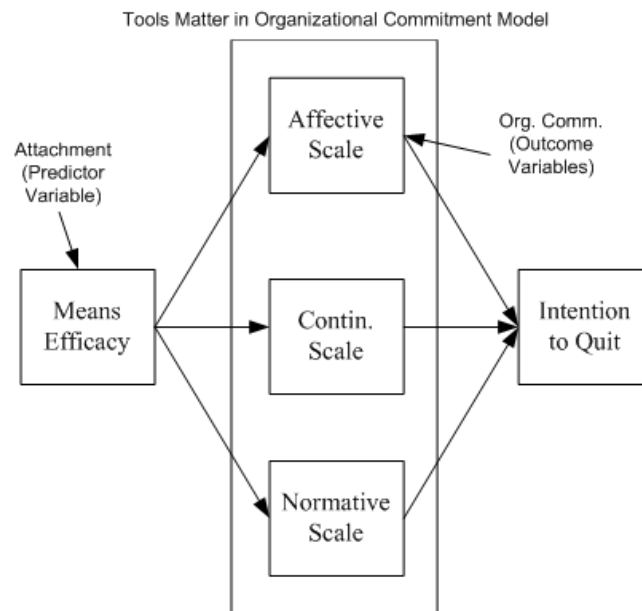
ORGANIZATIONAL COMMITMENT

Organizational commitment has been studied since the 1970s and the seminal work is that by Porter, Steers, Mowday, and Boulian (1974). Porter et al. defined organizational commitment as strength of identification and involvement with an organization. The psychological factors measured with definition are 1) desire to remain with the organization, 2) willingness to take on extra roles at work, and 3) alignment between personal and organizational goals.

For purposes of this study, organizational commitment uses the three-component model (TCM): affective, normative, and continuation (Meyer & Allen, 2004). The affective component implies rooting in emotional attachment to the organization; normative involves a sense of obligation to stay with the organization; and continuation is based on costs to leave the organization (Meyer and Allen, 2004). Scholars consider this TCM model the prevailing model in academic research on organizational commitment (Bergman, 2006), and Meyer and Allen saw their instrument as combining earlier works on organizational commitment.

FIGURE 1

Path Model



The affectively committed professional “identifies with, was involved in, and enjoys membership in the organization” (Meyer & Allen, 1990, p. 3). Affective commitment has also been identified as accepting and internalizing an organization’s goals. Meyer and Allen (1990) felt that normative commitment, while not as common, represented a viable construct, reflecting values or obligations that personnel feel toward the organization. Other scholars have tied normative commitment to duty (Bagozzi & Dholakia, 2006). Continuation commitment is a construct of the employee’s perception of the cost of leaving or remaining with an organization, and this is tied to the economic costs of leaving or staying (Meyer & Allen, 1990).

Intention to Quit: The predicative relationship between organizational commitment and turnover has been established outside of the IT/IS profession and organizational commitment is seen as a better predictor of turnover than job satisfaction (Hughes & Palmer, 2007). Organizational commitment and turnover has also been established in IT/IS specific studies.

Organizational commitment has been shown to predict IS/IT professional turnover at a statistically significant level in three recent studies. Telecommuting IS/IT professionals (n=171) in the U.S. showed a tie between organizational commitment and turnover (Ahuja, Chudoba, Kacmar, McKnight, & George, 2007), as did Canadian members of an IS/IT professional society (n=394) (Paré & Tremblay, 2007). Finally, Taiwanese IS/IT professionals (n=136), enrolled in graduate programs, also showed a relationship between turnover and organizational commitment (Chen, 2008).

The literature supports the model presented in Figure 1. Attachment or perceived efficacy of tools (or means efficacy) impacts the creation of in-groups or out-groups. The model proposes that means efficacy will have a predictive (not causal) relationship with organizational commitment and intention to quit.

HYPOTHESES

This study suggests that means efficacy will have a positive relationship with organizational commitment and its component parts, and a negative relationship with intention to quit. In addition, the model presented in Figure 1 is expected to be supported through path analysis and goodness-of-fit tests.

The hypotheses for this study are:

Hypothesis 1: Means efficacy will have a positive relationship with affective commitment.

Hypothesis 2: Means efficacy will have a positive relationship with normative commitment.

Hypothesis 3: Means efficacy will have a positive relationship with continuation commitment.

Hypothesis 4: Means efficacy will have a positive relationship with organizational commitment.

Hypothesis 5: Means efficacy will have a have negative relationship with the intention to quit.

METHODS AND INSTRUMENTS

A total of 301 IS/IT professionals involved with online discussion groups completed the survey between December 2009 and January 2010, and from this pool, 148 surveys were useable. A total of 153 (51%) did not complete the survey or were not working as IT professionals and were discarded. The survey was administered using a web-based tool. Spearman’s correlations test was run on the data to test the hypothesis (SPSS 18) because the data did not have a normal distribution. In addition, a path analysis was performed using Amos 18.

The instruments used for this study included the 18-item organizational commitment scale (Meyer & Allen, 2004), a 15-item means efficacy scale (Eden et al., 2008), and a 5-item intention-to-quit scale (Crossley, 2007). Multiple studies have used these scales, and they have been found to have acceptable reliability scores.

Reliability of the organizational commitment scale has been established in numerous studies. For example, a 2006 study reported Cronbach’s coefficient alpha scores of .83 for affective commitment, .85 for continuation commitment, and .84 for normative commitment (Davis, Pawlowski, & Houston, 2006). In the present study, the affective scale had a Cronbach’s coefficient alpha of .889, .627 for continuation commitment, and .863 for normative commitment. Although the continuation scale scored below .7, as recommended by statistics scholars (Field, 2005), the continuation scale was still used, given its reliability as reported in other studies.

Two studies show the reliability of the means-efficacy instrument (Eden et al., 2008; Walumbwa et al., 2008). Eden et al. reported a Cronbach’s coefficient alpha of .95, and Walumbwa et al. showed a Cronbach’s coefficient alpha of .79. In the present study, the means- efficacy scale items had a Cronbach’s coefficient alpha of .937.

Crossley, Bennett, Jex, and Burnfield (2007) used the intention-to-quit instrument in a study reporting a Cronbach’s coefficient alpha of .88, but the intention-to-quit scale represents only a portion of this reported instrument. Statistical scholars recommend that researchers not use Cronbach’s on scales with fewer than 10 items, but use inter-item correlation with values ranging from .2 to .4 (Pallant, 2007). The inter-item correlations for the five-item intention-to-quit scales ranged from .562 to .898, so it is considered to meet reliability requirements.

The organizational commitment and intention-to-quit items used a seven-point Likert scale with the following

values: 1, strongly disagree; 2, disagree; 3, slightly disagree; 4, undecided; 5, slightly agree; 6, agree; and 7, strongly agree. Several of the organizational commitment questions were reverse scored, but none of the intention-to-quit questions were reverse scored (Crossley et al., 2007; J. P. Meyer & Allen, 2004). The means-efficacy items used a five-point Likert scale with 1 representing “to a very little extent” and 5 representing “to a very great extent” (Eden et al., 2008). Permission was granted by e-mail to use intention-to-quit and means-efficacy scale items. Organizational-commitment scale permission was granted using an online system at <http://www.flintbox.com>.

RESULTS

The Kolmogorov-Smirnov scores for the scales failed the test for normality with $p < .05$ (Table 1). In addition, Kurtosis and skewness tests indicated non-normal distributions of the variables, and it was determined that Spearman's Rank test (r_s) would be used instead of Pearson's correlation test. The hypotheses are theorized to have a direction, so one-tailed tests were used (Trochim, 2006).

TABLE 1

Tests for Normality

	Kolmogorov-Smirnov Statistic	<i>df</i>	<i>Sig</i>	<i>Skewness</i>	<i>Kurtosis</i>
Intention to Quit	.164	148	.000	.703	-.408
Affective OC Scale	.128	148	.000	-.546	-.456
Continuance OC Scale	.141	148	.000	-.619	.213
Normative Scale OC Scale	.108	148	.000	-.236	-.770
Means Efficacy	.115	148	.000	-1.62	4.062

Participants had a mean age of 34.11 years, with 14.98 years of IS/IT experience, and 5.5 years' tenure in their current positions. The majority of the participants, 76%, reported their country of residence as the United States.

A perfect score on the normative commitment scale would be 42, and this study's sample presented an $M = 25.06$, $SD = 8.964$. A perfect score on the continuation-commitment scale would be 42, and this study's sample presented an $M = 22.71$, $SD = 6.519$. A perfect score on the affective scale would be a 42, and this study's sample presented an $M = 29.10$, $SD = 9.412$. A perfect score on the combined organization-commitment scale would be 126, and this study's sample presented an $M = 81.35$, $SD = 20.102$. A perfect score on means efficacy would have been 75, and this study's sample presented an $M = 56.61$, $SD = 11.810$. A perfect score on the intention-to-quit scale would have been 35, and this study's sample presented $M = 13.48$, $SD = 7.24$.

With the exception of continuation commitment or H3, means efficacy was found to have a positive relationship with organizational commitment using Spearman's correlation test. H5 was confirmed, and means efficacy had a negative linear relation with intention to quit using Spearman's correlation test (Table 2). The correlations for H1 and H4 are considered medium and the correlations for H2 and H5 are considered small (Pallant, 2007).

Path Analysis of the Model

Path analysis is used to study the direct and indirect import of variables, and is also used to confirm theoretical

models (Lomaz & Schumacker, 2005). The path coefficients generated represent correlations between the variables (see Figure 2). Small correlations were found in path coefficients. The path coefficient between affective scale and intention to quit was $-.39$, which is only $.01$ below large correlation statistics. However, no other coefficients were below a small correlation. The goodness-of-fit statistics on the model indicated that the model is not supported by the data.

Three tests—chi-square (χ^2), Goodness-of-Fit Index (GFI), and Root Mean Square of Error of Approximation (RMSEA)—were run to evaluate the fit of the model. These tests were performed using AMOS 18, and the model failed all three tests. The χ^2 is a reverse-scored test or a badness-of-fit test, and a significant test is considered an indication of a model that does not fit the data (Sinnott, 2008). The chi-square score— $\chi^2 (11, N = 148) = 86.175$, $p = .000$ —was significant and failed to confirm the model's fit. GFI scores were similar to the correlation tests between two variables; however, when using the GFI, the tested variables are the model predictions and sample data (Field, 2004; Sinnott, 2004). Scores above $.95$ indicate that the model is a good fit (Lomax & Schumacker 2004). The GFI of $.851$ for this test indicates a poor fit for the model and data. RMSEA is an absolute fit statistic that is often reported with χ^2 (Sinnott, 2008), and, thus, scores below or equal to $.05$ indicate an acceptable fit (Lomax & Schumacker, 2004). An RMSEA of $.375$ for this study's model indicates a poor fit between the model and the data.

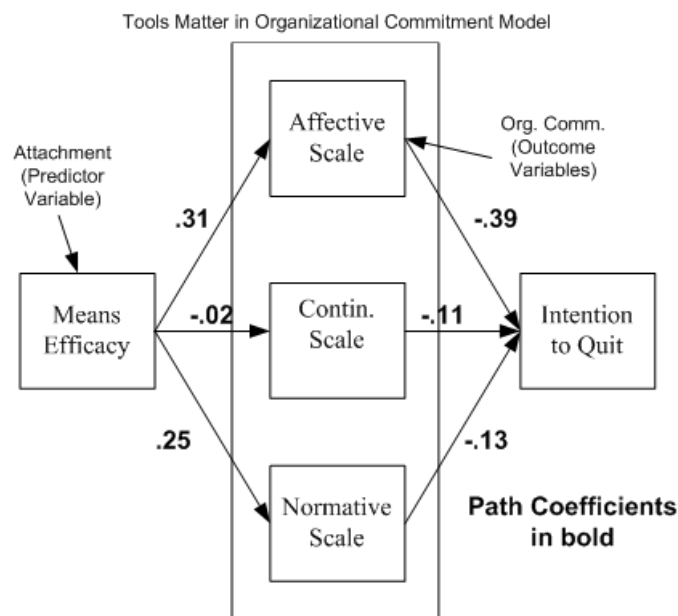
TABLE 2
Correlation Statistics (N=148)

		r_s correlation	$p >$
H1 Means efficacy will have a positive relationship with affective commitment.	Accepted	.371**	.000
H2 Means efficacy will have a positive relationship with normative commitment.	Accepted	.280**	.000
H3 Means efficacy will have a positive relationship with continuation commitment.	Rejected	-.028	.366
H4 Means efficacy will have a positive relationship with organizational commitment.	Accepted	.331**	.000
H5 Means efficacy will have a negative relationship with intention to quit.	Accepted	-.250**	.001

** statistically significant

FIGURE 2

Model 1 Path Coefficients

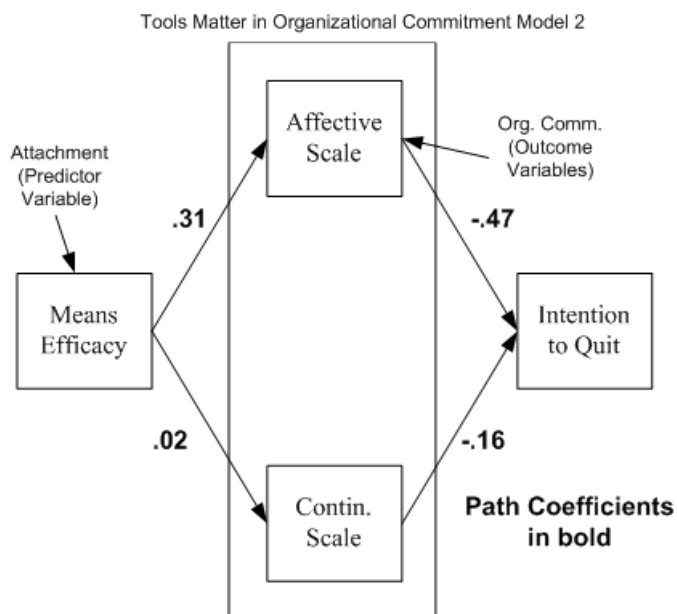


A standard practice with factor analysis is to adapt the model in an attempt to improve the fit (Lomax & Schumacker, 2004). The normative commitment was dropped from the model; the continuance scale was retained because of the model's focus on turnover. The fit and path coefficients improved with the new model (see Figure 3).

The coefficient between affective scale and intention to quit was $-.47$, which is a large correlation. All the goodness-of-fit tests showed that the new model is a better fit. The chi-square was insignificant $\chi^2 (8, N = 148) = 245, p = .885$, the GFI score was $.999$, and the RMSEA score was $.000$.

FIGURE 3

Model 2



TOOLS MATTER: DISCUSSION AND IMPLICATIONS FOR PRACTICE

Marketing literature has established that strong attachments to products can predict behavior. The results of this study indicate that tools or means matter to IT/IS professionals; their perception of resources or means impacts their organizational commitment and their intention to quit. No causation is argued for but caution for IT/IS managers is proposed.

This caution centers on possible flight of IS/IT professionals during the maintenance phase of a system's life cycle; naturally, systems move toward obsolescence and may be viewed as having less efficacy. This study indicates that IT/IS professional are more likely to turnover as systems are viewed as having less efficacy. A similar caution might be warranted during moves to alternate technologies.

Changes to database systems, server operating systems, development platforms or other systems could be perceived as inferior; the resulting drop in means efficacy could again result in higher turnover rates. Turnover is very costly for organizations.

Managers and analysts should, then, be aware that tools matter to IT/IS professionals and should consider means efficacy when planning system replacements or maintenance, trying new technology, and allow IS/IT professionals a clear path to work with newer systems. The implications for further research relates to adding a component to organizational commitment for tool dependent professionals.

Walumba et al. (2008) noted that means efficacy might be more prevalent in heavily tool-dependent professions. This study seems to confirm Walumba et al.'s observation for the IS/IT professions. Tools matter to IT professionals and should be considered when examining an IT/IS professional's organizational commitment. This could be the fourth component added to the three-component model of organizational commitment. This component would not be valid for all studies of organizational commitment but should be restricting to more "tool dependent" professions. Tools matter to IT/IS professionals.

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