Information Technology Acceptance in the Social Services Sector Context: An Exploration

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Abstract (summary)

Although computers and information technology (IT) have penetrated the field of social work, little research has systematically studied how users respond to this infusion. Information systems researchers have accumulated significant insights into IT acceptance in business organizations after decades of efforts. In this study, users in the social services were assessed for their acceptance of IT. A research model based on the decomposed theory of planned behavior was developed, arguing that attitudes toward using IT, subjective norms, and perceived behavioral control are important antecedents of intentions to use IT, which affect actual usage. In addition, users consider the benefits that they bring to their organizations and clients through using IT when forming their attitudes toward using IT. Data collected from users of a Homeless Management Information System in a northeastern U.S. state verified the research model. The results suggest new interventions to promote IT acceptance by users in the social services sector. [PUBLICATION ABSTRACT]
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KEY WORDS: decomposed theory of planned behavior; information technology; perceived client usefulness; perceived organizational usefulness; social services sector

More than three decades of research on information technology (IT) acceptance has made this field one of the most established research areas in management information systems (Venkatesh, Morris, Davis, & Davis, 2003). However, little has been done to understand IT acceptance in the social services sector, where nongovernmental, nonprofit organizations provide social and human services to "improve the conditions of disadvantaged people in society" (WordNet 2.0, 2005). Such organizations drive their operations and services on an overwhelming commitment to serve vulnerable populations, to protect their clients' integrity and privacy, and to improve the scarce resources within which current services are provided (Gutierrez & Friedman, 2005). In this way, organizations in the social services sector differ from other nonprofits, such as museums, private universities, and environmental organizations.

Today the social services sector substantially contributes to the U.S. economy. In 1998, nearly 400,000 nonprofits that provided social and legal services generated $74.45 billion in revenue and employed 1.9 million people (Austin, 2002). The gross output of social assistance reached $112.1 billion in 2003, with an annual increase of more than 9 percent since 1998, which was more than double the 4.4 percent annual increase rate of the overall gross domestic product during the same period (U.S. Department of Commerce, 2006). Employment in the social services is expected to outgrow the average increase in all occupations through 2012 (U.S. Department of Labor, 2005).

Compared with the business sector, social work presents a unique context that features highly limited resources coupled with the mandatory acceptance of organizational IT. Although all nonprofits need to adopt a more managerial approach and assume more operational accountability (Speckbacher, 2003), nonprofit social services organizations operate under even greater pressure given that they generate most of their revenue through external funds, half of which come from government agencies (Austin, 2002). It is not uncommon for social services sector organizations to be required to adopt certain IT to meet external requirements of program performance evaluation. Consequently, staff members at such organizations often view IT deployment and usage as a burden that interferes with their core missions. IT expenses, including user training and support, are seen as diverting precious resources from those in need to satisfy bureaucratic requirements (Benedetto & Pirie, 1989; Dukler, 1989). Moreover, the cultural and legal dynamics of data privacy make the electronic manipulation of client data highly sensitive. These organizational level concerns inevitably cause individuals to treat IT differently than users in the business sector. For example, researchers have found that funding agencies' current emphasis on administrative efficiency, coupled with concerns about the use of data, has resulted in negative user attitudes toward IT (Berlinger & Te'eni, 1999).

This study addresses IT acceptance in the social services sector by taking advantage of the knowledge accumulated from IT acceptance research in other organizational contexts. We based our research on the decomposed theory of planned behavior, a theoretical framework that enabled us to identify a set of factors that contribute to IT acceptance by users in the social services sector so that effective interventions can be designed to promote acceptance.
THEORETICAL DEVELOPMENTS

Decades of research in IT acceptance have identified the theory of planned behavior (Ajzen, 1991) as one of the leading theories in explaining how users respond to newly introduced IT (for example, Davis, Bagozzi, & Warshaw, 1989; Taylor & Todd, 1995; Venkatesh et al., 2003). It holds that actual technology usage is determined by users' intentions to use the technology. Three factors contribute to such intentions: (1) attitudes toward IT usage, (2) subjective norms, and (3) perceived behavioral control. Attitudes toward IT usage reflect users' calculations of the possible gains or losses caused by using the technology. Subjective norms are the effects from influential people on the users regarding their technology use. Perceived behavioral control describes the extent to which users feel they are actually able to use the technology. Each of these three factors is affected by a set of beliefs concerning technology use (namely, behavioral beliefs, normative beliefs, and control beliefs). In addition, perceived behavioral control also directly affects actual IT usage (see Figure 1).

The canonical way of applying the theory entails eliciting salient beliefs and their weights (Ajzen, 1991), which could take much effort. An alternative to this method is the decomposed theory of planned behavior (Taylor & Todd, 1995), which breaks down beliefs into multidimensional belief structures based on theories or previous empirical findings. Using this method provides multiple advantages (Davis et al., 1989; Taylor & Todd). Theoretically, decomposed belief structures clarifies the relationships between beliefs and antecedents of users' intentions to use IT. Methodologically, measures of the decomposed belief structures can be reused and hence confirmed or disproved across studies. In terms of practical value, the salient beliefs elicited may vary across studies, but the decomposed theory of planned behavior offers a set of specific beliefs that can affect users' intentions and actual acceptance. Hence the decomposed theory provides more insights than the original theory into how management can influence the acceptance process.

BEHAVIORAL BELIEFS

The theory of planned behavior views behavioral beliefs as considerations regarding the outcomes generated from engaging in certain behaviors or the cost incurred from these behaviors. Such beliefs provide the basis on which people form attitudes toward performing the behaviors. Previous studies consistently have suggested that perceived usefulness is the most important belief that contributes to individuals' attitudes toward IT usage (for example, Davis et al., 1989; Mathieson, 1991; Venkatesh et al., 2003). Davis defined perceived usefulness as "the degree to which a person believes that using a particular system would enhance his or her job performance" (p. 320). This definition clearly takes a personal perspective. Although personal benefits are certainly important, users in the social services are likely to think beyond their own benefits.

IT deployment in the social services sector is often mandatory because many organizations are pressured to adopt IT to meet external funding agencies' requirements. Resistance to IT could bring serious consequences, such as the loss of funds. On the positive side, IT has the potential to benefit organizations in numerous ways. For example, IT may help organizations improve their efficiency through faster data collection and distribution. The organizations can use the collected data to make better decisions and improve the quality of the services provided (Burt & Taylor, 2000). Using IT might promote organizations' political profiles and improve their chances of obtaining future funds (Dukler, 1989). Such considerations regarding organizational benefits should motivate users to accept IT.
Moreover, two common sources of resistance to IT deployment in nonprofits are the perception that IT expenditures compete with the already scarce resources for their missions and concerns about how the data will be used (Berlinger et al., 1999; Semke & Nurius, 1991). At the core of both sources of hesitation is uncertainty about the effect that IT would have on actual services. If users can be assured that IT would improve the amount and quality of their services, they should be more likely to embrace its deployment. Indeed, research suggests that IT can lead to such improvements, especially if the technology incorporates the functionality needed to support the organization's daily operations (Semke & Nurius).

These considerations led us to decompose behavioral beliefs into three types of usefulness: (1) perceived personal usefulness, which reflects beliefs about the benefits one gains from using IT; (2) perceived organizational usefulness, which refers to the extent to which users believe they can bring value to their organization; and (3) perceived client usefulness, which refers to the extent to which users feel IT can benefit their clients. Perceived organizational and client usefulness can be particularly important in affecting attitudes toward IT usage in social work. Research comparing volunteers with paid employees in nonprofits indicates that volunteers demonstrate more organizational citizenship and commitment (Laczo & Hanisch, 1999; LiaoTroth, 2001). Extrapolating these findings, we argue that users in the social services sector value the perceived organizational and client benefits more than users in other contexts and that they are motivated to use IT by altruistic considerations in addition to rational calculations of personal benefits.

NORMATIVE BELIEFS

In the theory of planned behavior, normative beliefs represent the social pressures to perform certain behaviors (Ajzen, 1991). Where IT acceptance is concerned, such beliefs refer to the influences of salient referents - people whose opinions one would value - on whether individuals should use IT. Previous research has used various referent groups, such as peers, superiors, subordinates, top management, MIS staff members, local experts, and friends (for example, Karahanna, Straub, Oc Chervany, 1999; Mathieson, 1991; Taylor & Todd, 1995). In the social services sector, some of these groups are not applicable but others can play an important role in convincing practitioners to use IT. Many social services organizations do not have an MIS department. Thus peers with technical know-how become important in providing the necessary support (Saidel & Cour, 2003). Peer influences can be significant, considering that employees in these organizations seem to maintain more congenial relationships than employees in other types of organizations (Laczo & Hanisch, 1999). Moreover, nonprofit organizations tend to have a flatter structure, and their culture tends to be more participatory and collegial (Mirvis, 1992), which makes the opinions of top management and supervisors easier to reach the users and more influential. Thus we use three salient referent groups: top management, supervisors, and peers, to study social service practitioners' embracement of IT.

CONTROL BELIEFS

Control beliefs capture the availability of the resources required to perform a behavior (Ajzen, 1991). Taylor and Todd (1995) decomposed them into self-efficacy-user beliefs in their competencies to use IT-and two types of facilitating conditions: resource facilitating and technology facilitating. Due to a dearth of resources (that is, time, funds, and equipment) and usually insufficient technical support and training, these factors can play an important role in
the social services sector. For our study, we refer to self-efficacy as users' self-confidence in their ability to use IT, and replace the facilitating conditions with perceived resources—the extent to which users believe that they have all that is required to use the technology and that consequently it is up to them to use it. As Chin (1998) demonstrated, directly measuring perceived resources is comparable with enumerating users' perceptions of the resources and help available to them. Figure 2 presents our research model.

METHOD

Following the tradition in IT acceptance research, we tested our model with a survey. Data were collected from users of a Homeless Management Information System (HMIS) implemented in a northeastern U.S. state through an online survey. Homeless Management Information Systems are applications that help homeless assistance providers collect information about client needs, service usage, and service outcomes. Some systems also provide access to resources, referral information, and support for managing operations (U.S. Department of Housing and Urban Development, 2004). By the end of 2005, there were more than 180 implementations throughout the nation, stemming from a 2001 congressional mandate to report on the extent of homelessness in the nation and the efficiency of services provided by local jurisdictions. Service providers must use these systems to receive government funds. The system under study was a statewide implementation with 140 service agencies deployed and an average of four users per agency.

Measures

All measures, except those for perceived organizational usefulness and perceived client usefulness, were either adopted or adapted from items that have been used repeatedly in previous research and have demonstrated good psychometric properties. Perceived organizational usefulness and perceived client usefulness were new constructs developed for this study. Measures for both were developed along guidelines established in previous research (for example, Hartwick & Barki, 1994; Mathieson, 1991; Taylor & Todd, 1995; Venkatesh et al, 2003). All measures were tested with a pilot survey of users of another HMIS in another northeastern state. Appendix A enumerates the measures.

Survey Administration

An online survey was administered during the summer of 2005. Contact was made with the system administrators at each agency and user participation was solicited through mediation, which probably limited our ability to recruit survey respondents. To draw participation, an offer was made to select randomly one respondent and donate $100 to a charity of his or her choice in his or her name. The final survey questionnaire was four pages. The first page introduced the survey as "a survey on the user experience with the Homeless Management Information System" and included the lottery information. We asked for demographic information on the second page. All constructs were measured on the third page, and the items were arranged in random order. Finally, a thank-you page concluded the survey.

RESULTS

Response Analyses
In total, 61 usable responses were received, although one omitted some demographic information. Among the respondents, 73 percent were female (n = 44) and 27 percent were male (n = 16). One-third of the respondents were older than 50 years of age (n = 20), with another third between 31 and 50 (n = 20). Eighteen other respondents were between 26 and 30. Only two of the respondents were 25 years old or younger. About 60 percent of the respondents had at least a college education (n = 36), including 16 with postgraduate experience. Eleven respondents had less than a high school education. Demographically, our respondents were different from typical respondents (that is, college students or users in business organizations) in previous studies.

Respondents represented 24 different agencies. Among the agencies, 15 had only one respondent. The agency that had the most respondents (17) also had the largest number of users in the state. Our respondents reported 35 different work titles, ranging from social worker to administrator. The most reported title was case manager (n = 10). On average, the vast majority of respondents (n = 58) had been working in their current agency for more than seven years (M = 7.08), with a range of 10 months to more than 21 years. Most had held their current titles for more than four and a half years (M = 4.65). In general, the respondents were familiar with the HMIS, reporting an average experience with the system of almost three years (M = 2.97 years), with a range from five to 56 months.

Measurement Properties

Partial least squares regression was used for data analysis. This technique has minimal demands for sample data distribution, residual distributions, and most importantly, sample size (Chin, 1998, 2000). In our research model, a dependent variable had at most three independent variables directly affecting it (see Figure 2). A sample size of 30 responses would be deemed sufficient with this technique based on the regression heuristic of 10 cases per predictor (Chin, 1998). The software used was PLS-Graph Version 03.00 Build 1126 (Chin, 2001).

To determine the measures' psychometric properties, we examined the variables' composite reliabilities, the average variances extracted by the variables from their indicators, the correlations among variables, and the indicator-factor (cross-)loadings (Chin, 1998). Table 1 presents the composite reliabilities, the average variances extracted, and the correlations, all generated by PLS-Graph. The factor loadings and cross-loadings were obtained through simple manipulations of original data set and PLS-Graph output with SPSS (Gefen & Straub, 2005) and are presented in Appendix B.

As demonstrated in Appendix B, the minimal indicator-construct loading in this study was 0.77, with most loadings greater than 0.9. The lowest composite reliability was 0.76 for perceived behavioral control. All other composite reliabilities were greater than 0.85. Hence the measures demonstrated high reliabilities. Furthermore, all loadings of the indicators onto their own variables were significant at the ? < 0.001 level (see Appendix B). The square roots of the average variances extracted for all variables were larger than 0.75 (see Table 1). For all constructs except perceived behavioral control, the indicator loadings were at least one order of magnitude higher than their cross-loadings with other constructs, and the square roots of all average variances extracted were much higher than their correlations with other variables. The square root of the average variance extracted for perceived behavioral control (0.779) was only slightly higher than its correlation with self-efficacy (0.776, Table 1). However, the loadings of the indicators of the two variables onto themselves were still
considerably higher than their cross-loadings with the other variable (Appendix B). Hence we maintained the discriminant validity between the two variables. Thus we conclude that overall, the measurement models in this study are satisfying.

Model Testing

Bootstrapping with 500 resamples was run to obtain the standard errors for the path coefficient estimates. The statistical significances of the path coefficients were then computed using t tests. Overall, the model accounted for considerable variance in user intentions to use IT (R^2 = 0.41) and actual IT usage (R^2 = 0.68).

The analysis showed that the intentions to use IT strongly predicted actual usage, with a coefficient of the path from intention to actual usage as high as 0.69 (p < 0.001) (Figure 3). In addition, perceived behavioral control, as suggested by the theory of planned behavior, had a smaller, but significant effect on IT usage (β = 0.21, p < 0.05). Perceived behavioral control, in turn, was jointly affected by self-efficacy and perceived resources (β = 0.58, p < 0.001 and β = 0.32, p < 0.05, respectively). Hence the more comfortable and confident users felt about using an IT, the more they intended to use the IT, and the more likely they were to use it.

The analysis also indicates that the intentions to use IT were more inclined to use it. We had proposed that the users' attitudes were formed by three different perceptions regarding the benefits generated from using IT: personal usefulness, organizational usefulness, and client usefulness. The effect of perceived personal usefulness on attitudes was highly significant. Although perceived organizational usefulness had no detectable effect on attitudes, perceived client usefulness had a moderate effect (β = 0.28, p = 0.14), lending some support to our argument that in the social services sector, altruistic assessments caused by using a particular IT positively affect users' attitudes toward using the technology.

According to the data, the social pressure to use IT in the social services sector mostly comes not from top management and supervisors, but from peers, as only the path coefficient from peer influence to subjective norm was significant. This finding reiterates the importance of peer support in using IT (Saidel & Cour, 2003). Surprisingly, the data suggest that respondents did not react to the social pressure exerted on them to use the technology, as the path coefficient from subjective norm to the intention to use IT was insignificant. Thus the effects of subjective norms on intention to use IT and its role as a mediator between normative beliefs and user intentions to use IT were inconclusive in this study.

DISCUSSION

The reported study applied the decomposed theory of planned behavior to understand IT acceptance in the social services sector. The research model was tested with survey data collected from users of an HMIS. Although the data in general supported the research model, several limitations should be noted when interpreting the study's findings. Our inability to contact the users directly likely affected the sample size negatively. Even though the sample size exceeded the baseline requirement, a larger sample would bring more confidence to the findings' generalizability. Nor could we determine how representative our respondents were of all users. We observed that the volunteers and staff members working in the agencies where the survey was administered tended to be mature, female social workers. The agency
directors also viewed the respondents as representative. Nevertheless, readers should use caution when generalizing our findings.

Theoretical Contributions and Future Research

The reported study made two theoretical contributions. First, it identified a theoretical foundation on which IT acceptance in the social services sector can be investigated systematically: the decomposed theory of planned behavior. Using this theory, more studies could be designed and results compared to lead us to a better understanding of this important issue. Second, it shed new light on the important factors that affect IT acceptance in the social services sector. When developing the research model, we identified important behavioral, normative, and control beliefs. In particular, we expanded the construct of perceived usefulness to include not only the personal perspective, but also organizational and client perspectives. Even though these two new usefulness variables were derived in the context of social services sector applications, they can be incorporated into other contexts as well, as research on prosocial behavior has long suggested that employees may perform certain behaviors not because such behaviors are useful to them personally, but because doing so helps their organizations or their clients (Brief & Motowidlo, 1986).

Although the data lend moderate support to the role that perceived client usefulness plays in forming users' attitudes toward using IT, no effect of perceived organizational usefulness was detected. One possible explanation is that our respondents did not care about their organizations, which we thought unlikely considering that our respondents had worked in their organizations for an average of seven years. We suspect that although the respondents were convinced of the personal productivity gained by using the system, they doubted the benefits that using the system brought to their clients, and even more strongly doubted the benefits it brought to their organizations. We will continue investigating both new usefulness perceptions in future studies to be more conclusive about the roles both play in affecting IT acceptance in the social services sector.

That subjective norms had no found effect on users' intentions to use IT surprised us. The statistical technique we used-partial least squares regression-is known to deflate path coefficients. That is, even if there were a significant relationship between the two variables, the technique may not be sensitive enough to detect it. The small sample size used in this study also might have limited our ability to detect the effects of subjective norms in this study. We should be able to confirm the role of subjective norms in future studies with a larger sample size.

Practical Implications

Findings from this study should interest administrators and policymakers who are involved in IT deployment in the social services sector. The study's framework provides considerable insights into how we can design new, effective intervening measures to promote IT acceptance. According to the research model, user acceptance is affected by users' intentions to use IT and the capacity they have to carry out their intentions. Because users' intentions are in turn affected by attitudes, subjective norms, and perceived behavioral control, efforts to increase user acceptance should be directed at forming positive attitudes toward technology usage, cultivating a social environment favoring IT adoption, and increasing users' perceived control over the applications they use.
To be more specific, we suggest five areas that administrators and policymakers can address to achieve a more effective infusion of IT in their organizations. First, administrators and policymakers can focus on empowering users and transferring ownership to them of the technologies and processes for which they are responsible. Empowerment means delegating responsibility for defining how one's own functions should be conducted. For example, a committee of case workers can be appointed to define the procedures for collecting client data during intake. The technological applications to be used should be adjusted to conform to the defined procedures, not the other way around. This likely will help convince users not only of their control over the technology, but also of the technology's usefulness to themselves, their organizations, and their clients.

Second, there are innumerable issues pertaining to the logistics of where, how, when, and who interacts IT during IT deployments. Our study suggests that users will be more receptive to resolutions to these issues when peers, rather than administrators, propose them. Hence when making IT-related decisions, administrations should promote and nurture processes that foster peer-based initiatives and self-managing teams, that is, teams with responsibility for self-determination. Self-management teams enable homogeneous groups of users to engage in improvement, control, and innovation activities and can be an effective management tool for promoting user acceptance of IT in the social services sector.

Third, findings from this study hint at the benefit of expanding IT training programs to include the concept of value to the client and value to the organization. Conventional IT training programs tend to focus on the technical aspects of computers, data, and the specific applications in use. They are known to improve IT acceptance through increasing self-efficacy (Bedard, Jackson, Ettredge, & Johnstone, 2003). We recommend adding to these programs an element that assures users of the value that IT can bring to their organizations and clients. As this study suggests, training programs would be significantly more effective with these value propositions at the forefront.

Fourth, rewards and recognition systems are powerful change enablers. Providing individual or group recognition based on performance measures enables administrators to capitalize on the few instances in which exemplary, innovative performance demonstrates achievement and closure. We suggest restructuring performance measures of IT usage to include measures of improvements to organizational performance and client benefit in addition to personal productivity gain. Such performance measures are based on a more comprehensive view of the benefits of IT and should more effectively encourage users to use it.

Finally but not least important, we strongly encourage organizations in the social services sector to institutionalize a structure, however modest, to support the IT infrastructure. Moreover, users need to be reminded that help is available and should be taught to use the help. Our study demonstrates that perceived resources significantly affect perceived behavioral control and users’ intentions to use IT. The availability and sense of support should enhance the users’ belief that they have what they need to operate the technology, which consequently will lead to a higher level of IT acceptance.

REFERENCES


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