IT Impact on Individual Work: A Study in the Context of Healthcare Services

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IT Impact on Individual Work: A Study in the Context of Healthcare Services

Research-in-Progress

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Abstract

The use of IT has considerable potential to impact the healthcare industry. Recent applications such as electronic medication administration systems (EMAS) are expected to improve medication safety and delivery. However, the impact of such systems on users’ job performance is unclear and under-researched. This study develops a model to understand the individual impact of healthcare IS such as EMAS based on the job characteristics and relational job design theories. A pilot survey with 112 nurses was conducted to validate the model for EMAS implementation in a public hospital. The use of IS is seen to affect the perceived increase in skill variety. Prosocial values of nurses are found to strengthen the relationships between use of IS and perceived increase in task significance as well as beneficiary contact. Self-efficacy affects perceived increase in various job characteristics. Perceived increase in task identity and beneficiary contact in turn influence user efficiency and effectiveness. The expected contributions and remaining research plan are outlined.

Keywords: Healthcare information systems, electronic medication administration, job characteristics, relational job design, individual impact, self-efficacy
**Introduction**

The healthcare industry is expanding even as other industries are shrinking in the economic downturn. It is estimated that the U.S. will spend close to 20% of its GDP on healthcare by 2015 (Borger et al. 2006). Despite the growing size of the healthcare industry, it is thought to lag behind other industries in IT adoption by as much as 10 years (Skinner 2003). Due to the relatively slow adoption and the potential impacts arising from the use of IT in healthcare, the healthcare industry is a relevant choice for IS research (Wilson and Lankton 2004). IS and organizational theories can be applied to understand the socio-technical aspects of IT implementation, but work in this area has been insufficient.

The use of IT in secondary healthcare is evolving as healthcare IS are being developed for wider applications in hospital use (Khounbati and Themistocleous 2006). While IT systems such as Computerized Physician Order Entry (CPOE) systems have been around since the 1990s (Sittig and Stead 1994), one of the more recent IT applications is the electronic medication administration system (EMAS). Such systems include electronic prescribing, electronic medication records, and barcode scanning of wrist-tags worn by patients. The main objective of EMAS is to reduce prescribing and medication errors and increase efficiency in medication delivery (Franklin et al. 2007).

Even with their increasing deployment, it is unclear if IS such as EMAS are effective in impacting healthcare. Studies from the medical informatics literature focus mainly on the effect of EMAS on patient safety (Franklin et al. 2007). The impact of such systems on the users (healthcare professionals) is under-researched. It is hence timely to examine if healthcare IS such as EMAS are serving the intended purpose of improving efficiency and effectiveness of healthcare workers. This could be useful in convincing healthcare workers to use healthcare IS, as research has shown that user resistance is one of the main barriers to the adoption of healthcare IS (Poon et al. 2004).

Motivated by the theoretical gaps and practical implications, our research question is, “How does the use of healthcare IS such as EMAS impact individual work, in terms of job performance?” While IS research is rich in studies of technology adoption, there is little previous work on how the use of IT impacts individual job performance (Chan 2000; Chau et al. 2007). In this study, we use two theoretical lenses from the organizational behavior literature, i.e., the job characteristics and the relational job design theories, to develop a model to understand the impact of EMAS on nurse’s work. This paper presents the results of a pilot survey evaluating the use and individual impact of EMAS newly implemented in a public hospital. In the future, a full scale survey will be conducted to validate the research model. The results are expected to contribute theoretical insights as well as practical suggestions on how to improve use of healthcare IS such as EMAS for greater impact.

**Conceptual Background**

A salient issue pertaining to IT impact on individual work is whether computerization leads to job redesign and enrichment (Millman and Hartwick 1987). Thus, a relevant theoretical background for our research is job design, which is known to impact individual work motivation and performance (Hackman and Oldham 1976). The use of IT may affect job design by changing certain job characteristics (Ryker and Nath 1995). In this study, we propose the use of two theoretical perspectives in job design to understand the phenomenon: (1) the job characteristics model and (2) the relational job design model.

**Job Characteristics Model**

The job characteristics model (Hackman and Oldham 1975; Hackman and Oldham 1976) is one of the dominant perspectives in explaining how job features are related to individual reactions to work. It proposes the conditions under which employees will be motivated to perform effectively. The model identifies five job characteristics which could affect work outcomes, i.e., skill variety, task identity, task significance, autonomy and feedback. Skill variety refers to the extent to which an employee uses different skills to perform his/her job. For example, an owner-manager of a small company who does all tasks himself requires a variety of skills to complete different tasks. Task identity refers to the extent to which an employee can complete a whole piece of work. For example, a worker who designs and builds furniture has a job that is higher in task identity compared to one who solely does painting of the furniture. Task significance refers to the extent which a job impacts others’ lives. For example, nurses or counselors may view their jobs as high in task significance. Autonomy refers to the freedom an employee has in carrying out his/her work. For example, a job that allows the employee to plan and schedule his work activities for the day is high in autonomy. Feedback refers to the extent to which a job provides information about the employee’s performance. For example, a worker who gets to test the equipment he builds receives feedback on the quality of his work. These five job characteristics are thought to influence three underlying psychological states, namely, experienced meaningfulness of the work, experienced responsibility for the outcomes of the work, and knowledge of the results of the work activities. These three psychological states in turn lead to positive personal and work outcomes, such as high internal work motivation, high quality work performance, high job satisfaction, low absenteeism and turnover.
The job characteristics model has been applied in IS research mainly to study the job design, motivation, and work outcomes of IS professionals (e.g., Ang and Slaughter 2001; Myers 1991; Smits et al. 1993). However, it has rarely been applied to study IT impact. An early study investigated the impact of automated office systems on the work of middle managers by measuring changes in their job characteristics (Millman and Hartwick 1987). Managers from various organizations and industries using different systems were surveyed. Another study measured changes in job characteristics after the implementation of computer systems but the survey was based on all systems used, rather than the impact of a single IT system (Ryker and Nath 1995). Nevertheless, both studies affirm the validity of using the job characteristics model to study IT impact on individual work.

Although the job characteristics model has a long history in organizational behavior research, it is still subject to criticisms. A shortcoming of the job characteristics model is in not considering other important work characteristics such as the social environment and work context (Humphrey et al. 2007). Hence, alternative theoretical perspectives have emerged, such as the relational job design theory which is described next.

**Relational Job Design Model**

Prosocial characteristics that enable employees to benefit other people have important implications for individual job performance (Grant 2008b), especially for jobs that involve serving others e.g., nursing, counseling, or social work. The relational job design model describes how the characteristics of such jobs may spur employee’s motivation to make a prosocial difference, thereby affecting the employee’s job behavior (Grant 2007).

Studies have shown that motivation to do good is not just an individual trait. Rather, it can be shaped by the context and situation (Nelson and Norton 2005). However, there is little research about how work context can strengthen such motivation to do good (Grant 2008a). The relational job design model explains how motivation to make a prosocial difference can be enhanced by increasing employees’ contact with and perceived impact on their beneficiaries. The theory posits that relational properties of the job can be designed to increase an employee’s opportunity to impact beneficiaries’ lives. This in turn increases employee’s motivation to make a difference, resulting in extra effort to help their beneficiaries.

A key independent variable of the relational job design model is beneficiary contact. **Beneficiary contact** refers to the degree to which the job provides opportunities to meet and interact with beneficiaries. For example, in the case of nursing, beneficiaries refer to the patients being served. In the model, beneficiary contact is hypothesized to affect **perceived impact on beneficiaries**, which refers to the degree which employees experience their actions as positively affecting beneficiaries.

**Integrating the Two Models**

We can see from the above overviews that both the job characteristics model and the relational job design model share similar underlying themes, namely work motivation and job outcomes. Each theory attempts to explain how certain job characteristics can motivate employees to perform more effectively at work. However, the two theories have a different focus. The job characteristics model emphasizes structural properties whereas the relational job design theory focuses on relational properties of the job that affect job performance. Thus, these two models may offer complementary explanations to the link between IT use, job redesign, and individual impact. Further, since the relational job theory has not been applied to study IS phenomena, this study will contribute to the application of a new theoretical perspective in IS research. In addition, the nature of work has changed considerably over the years due to the introduction of new IT, but there have been few recent studies to address the impact of such changes on the nature of job and job performance (Humphrey et al. 2007). Hence, it is timely to work towards addressing this gap by studying the impact of IT on healthcare work using the above lenses.

**Research Model and Hypotheses**

**Job Characteristics – Skill Variety and Task Identity**

Studies have shown that the five characteristics outlined in the job characteristics model are positively related to internal work motivation and job performance (Humphrey et al. 2007). Use of IS is expected to influence one or more of the five job characteristics (Ryker and Nath 1995). In particular, use of IS may increase the **skill variety** of employees as the employee is required to use IT (e.g. computers and handheld devices) to aid in his/her work. To the employee, this may mean an increase in skill variety as he/she has to learn and use IT skills in addition to the existing skills required for his/her job. As the healthcare IS replaces paper records and routine checks in medication delivery, it does not lead to the deskilling of nurses.
Based on the above argument, use of IS is expected to increase skill variety of users and its perception. Hence, we hypothesize:

\textit{H1: Use of IS is positively related to perceived increase in skill variety}

Use of IS is expected to increase task identity if computerization allows work to be reorganized such that the employee can complete whole pieces of work. This is especially so in the case of EMAS as it is designed to improve information flow and coordination among the healthcare workers for medication management, thus creating what is commonly termed as “closed loop” medication administration (Franklin et al. 2007). With information at their fingertips and technology that enables nurses to view and administer the entire medication process, nurses may perceive an increase in task identity. Based on the above reasoning, we expect that the use of IS will result in increase in task identity of users and its perception. Hence, we hypothesize:

\textit{H2: Use of IS is positively related to perceived increase in task identity}

However, we do not expect the use of healthcare IS such as EMAS to affect the structural job characteristics of feedback and autonomy. Although such IS may be able to give feedback, it is usually restricted to the function it is designed for, not the entire process or job undertaken by the employee. Neither do we expect the use of healthcare IS such as EMAS to necessarily increase autonomy or job freedom. For example, EMAS requires nurses to administer medicine at regular scheduled time intervals as determined by the physicians (Franklin et al. 2007). For the remaining structural job characteristic (task significance) and relational characteristic (beneficiary contact) we expect that use of IS may influence them depending on individual traits i.e., prosocial values.

\textbf{Prosocial Values and Task Significance}

In a recent conceptualization of work design, it was proposed that worker characteristics have implications on job characteristics (Morgeson and Humphrey 2008). Past research on job design has tended to ignore the characteristics that employees must possess to perform the roles implied by the job characteristics. For service jobs, the relational job design model (Grant 2007) suggests that employees’ prosocial characteristics will be important. Thus for healthcare workers such as nurses, we expect their prosocial values can influence perceived job characteristics.

Prosocial values refer to “the extent to which individuals regard protecting and promoting the welfare of others as important guiding principles in life” (Grant 2008a, p. 111). Prosocial values have also been described as “the need to be helpful and a desire to build positive relationships with others” (Rioux and Penner 2001, p. 1307). Among the structural job characteristics, we argue that prosocial values will influence worker’s perception of increase in task significance since it relates to the job’s impact on other’s lives.

At the same time, use of IS may increase task significance as the employee is no longer occupied with routine tasks such as keeping paper records or looking for missing medication records prior to the EMAS. The user is then expected by management to spend more time interacting with customers or beneficiaries. For example, a nurse may perceive her job to be more significant if she has more time to care for patients with the time savings from using the healthcare IS. An employee who has higher prosocial values is more likely to perceive an increase in task significance from the use of the IS. Thus, we hypothesize a moderating relationship:

\textit{H3: Use of IS is positively related to perceived increase in task significance when prosocial values are strong}

\textbf{Prosocial Values and Beneficiary Contact}

A key relational job property highlighted in the relational job design model is beneficiary contact. It is defined as “the degree to which the job provides opportunities to meet, communicate, and interact with beneficiaries” (Grant 2008b, p.21). Job contact with beneficiaries consists of three dimensions, i.e., frequency, breadth, and depth (Grant 2008b). Frequency refers to how often the job provides opportunities for contact with beneficiaries. Breadth refers to the degree which the job gives opportunities to interact with a variety of different beneficiaries. Depth refers to the extent to which the job provides opportunities for meaningful interactions with beneficiaries.

The use of IS may provide employees with more opportunities for contact with beneficiaries. IS can automate routine work or manual tasks and free up time that management expects service employees to spend on more frequent and deep interactions with beneficiaries. For example, it was found that medication administration and documentation accounted for most of nursing practice time (Hendrich et al. 2008) for which EMAS could improve efficiencies and allow more time for patient care. However, the use of IS may not increase the breadth of beneficiary contact, as it has little effect over the variety of beneficiaries served by the employee.
As argued previously, certain employee characteristics may influence how they perceive the benefits of using IS. The use of IS may allow prosocial employees to interact more frequently and meaningfully with their beneficiaries. For healthcare IS such as EMAS, prosocial nurses may perceive greater increase in beneficiary contact from the system use. Similar to H3, we hypothesize a moderating relationship as prosocial values may allow the employee to perceive greater changes in beneficiary contact from use of the IS.

**H4: Use of IS is positively related to perceived increase in beneficiary contact when prosocial values are strong**

**Self-Efficacy**

Among individual traits, core self-evaluations are positively related to perceived job characteristics (Judge et al. 2000). Core self-evaluations refer to “fundamental assessments that individuals make about themselves and their self-worth” (Judge et al. 2000, p. 237) and include dispositional traits such as generalized self-efficacy and self-esteem. In the context of our study on IT impact, self-efficacy is a core self-evaluation that should affect perceived job characteristics. Self-efficacy refers to one’s beliefs about one’s ability to use a technology to accomplish a particular job or task (Venkatesh et al. 2003). We argue that an individual who is high in self-efficacy is likely to perceive greater changes in job characteristics as a result of using the IS.

An employee who is confident in using the IS is more likely to perceive increase in skill variety as a result of using the system. For example, nurses with high system self-efficacy may perceive that they have gained greater skill variety from using EMAS. Employees’ confidence in using the new system makes them feel that they have added more skills by learning the use of IS. Thus, we hypothesize:

**H5: Self-efficacy is positively related to perceived increase in skill variety**

Employees with positive core evaluations are more likely to look for information in their work environment that would lead to job completion (Judge et al. 1998). Thus employees who are confident of using a new IS are better able to use it to access necessary information and complete their task. For EMAS use, a nurse with high self-efficacy may be able to use the system to work on more parts of the task, thereby perceiving greater increase in task identity.

**H6: Self-efficacy is positively related to perceived increase in task identity**

Similarly, an employee with high self-efficacy is more likely to conclude that his job is more significant (has greater impact on others) as a result of using IT. For nurses with higher confidence in using EMAS, the increase in task significance (impact on patients in terms of medication safety) due to introduction of the new IS will appear greater.

**H7: Self-efficacy is positively related to perceived increase in task significance**

Last, an employee who is confident of using the new IS may view that the system allows him/her to have more frequent and meaningful interactions with the beneficiaries. For nurses, confidence in using the EMAS empowers them to have greater contact with their beneficiaries (patients) in terms of frequency and depth. Hence,

**H8: Self-efficacy is positively related to perceived increase in beneficiary contact**

**Individual Impact**

Previous studies have shown that job characteristics are related to individual’s work performance (Humphrey et al. 2007). Individual impact refers to the influence of IS on the job performance of the individual (Igbaria and Tan 1997). Individual’s job performance with IS can be assessed in terms of efficiency and effectiveness (Beal et al. 2003; Campbell 1990). Efficiency refers to how the IS has influenced productivity of individual work such as time taken and resources used (DeLone and McLean 1992). Effectiveness refers to how the IS has affected individual’s work outcomes such as quality and accuracy (Gable et al. 2008). Employees who perceive the use of technology to be beneficial in enhancing their job characteristics of skill variety, task identity, and task significance are likely to feel a greater individual impact (efficiency and effectiveness) from the IT. Added skills, better task completion, and increased impact on beneficiaries should lead to more efficient and effective job performance.

**H9: Perceived increase in skill variety is positively related to individual impact**

**H10: Perceived increase in task identity is positively related to individual impact**

**H11: Perceived increase in task significance is positively related to individual impact**

Other than structural job characteristics, the relational job property of beneficiary contact should also influence job performance (Grant 2007). When a new IS saves time and allows more frequent and deeper contact with beneficiaries, this is
likely to increase the efficiency and effectiveness of workers. For example, when nurses feel that the EMAS allows greater beneficiary contact they will perceive higher individual impacts from the IS.

H12: Perceived increase in beneficiary contact is positively related to individual impact.

Figure 1 shows the proposed research model.

![Research Model for the Individual Impact of IT](image)

**Research Methodology**

Survey methodology was employed to test the research model. To investigate our research question of understanding how use of healthcare IS affects individual’s work, the study was conducted in one healthcare organization with a particular type of IS. The use of a single organization acts as a natural control for organizational effects. A public hospital with more than 900 beds and 3000 professional staff was selected as the study site as it is in the process of implementing an EMAS to aid in delivering quality healthcare. This system is being used by nurses for the administration and delivery of medication. The EMAS implementation started in late 2008 and will be rolled out across all wards in a phased manner. We could conduct a pilot survey with the nurses in those wards that had already implemented the system. The future plan is to study additional wards and stakeholders as the system is extended to include them.

**Survey Instrument**

The model constructs were operationalized mostly based on items from previously validated instruments from IS (e.g. self-efficacy items from Taylor and Todd 1995) and organization behavior literature (e.g. job characteristics items from Hackman and Oldham 1975). Conceptual validity was assessed by using the sorting procedures proposed by Moore and Benbasat (1991). Due to lack of space, the survey instrument is not included but examples are provided from each construct. Examples of items include “I use most of the features of the EMAS” (Use of IS), “After I started using the EMAS, the number of skills that I acquire for my job has increased” (Perceived Increase in Skill Variety), “After I started using the EMAS, my job has greater impact on others” (Perceived Increase in Task Significance), “After I started using the EMAS, my job is better arranged so that I can do an entire piece of work from beginning to end” (Perceived Increase in Task Identity), “After I started using the EMAS, I have more meaningful communications with the people who benefit from my work” (Perceived Increase in Beneficiary Contact), “I can easily use the EMAS on my own” (Self-Efficacy), “I feel it is important to help those in need” (Prosocial Values) and “The EMAS saves me time” (Individual Impact). All items are anchored on 7-point Likert scales.

**Survey Administration**

The survey was administered at the hospital to nurses who have used the EMAS for at least three months. This allowed them sufficient time to be familiar with the system and to perceive any changes to their work as a result of using the system.

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1 Range of use is used to measure IS use since the frequency or duration of use would not be a meaningful measure of use in a mandated system (Jasperson et al. 2005).
token incentive was given to encourage participation. The response rate was 100% as every nurse we approached agreed to complete the survey. At this time, we have 112 survey responses. As data collection is still ongoing, we present the preliminary results in this paper. The sample consists of 97.3% female and 2.7% male nurses. The mean age is 31.5 years, with 54.5% respondents in the age group 21-30 and 29.4% in the age group 31-40 years. The average job tenure is 3.5 years in the hospital. The average system experience is four months. Job tenure and EMAS experience were included as controls in the model.

Data Analysis and Results

The survey data was analyzed using Partial Least Square (PLS). PLS is a suitable choice for analyzing our model with formative constructs and moderating effects (Chin et al. 2003). In our study, individual impact is formative as the indicators are defining characteristics of the construct, measuring both efficiency and effectiveness dimensions. Interaction variables were computed by cross-multiplying the standardized items of each construct (Chin et al. 2003).

Instrument Validation

Reliability of the reflective constructs was assessed using Cronbach Alpha and composite reliability scores. All Cronbach Alpha values exceeded 0.80 and all composite reliability scores exceeded 0.90 indicating adequate reliability (Nunnally 1978). Convergent and discriminant validity is demonstrated when indicators: (a) load higher on their hypothesized factor than on other factors (b) square root of each factor’s average variance extracted (AVE) is higher than its correlations with other factors (Chin 1998). Table 1 shows the descriptive statistics, correlation matrix, and AVE for the constructs. As observed from the table and factor analysis results (not included due to lack of space), both conditions are met thus demonstrating convergent and discriminant validity (Hair et al. 1998). Although some of the correlations are high, none exceed the threshold of \( r > 0.85 \), and the Variance Inflation Factor (VIF) and Condition Index do not indicate multicollinearity. Common method bias is also not indicated. Hence, we proceed to test the structural model.

Results of Hypothesis Testing

Figure 2 shows the standardized PLS path coefficients and Rsquare values. The significant effects are shown in solid arrows. The results indicate that H1, H3, H4, H5, H6, H7, H8, H10 and H12 were supported while H2, H9, and H11 were not. In total, 9 out of 12 hypotheses were supported and 77% of the variance in the outcome variable explained.

Discussion and Conclusion

The results show that use of IS is positively related to perceived increase in skill variety. This is encouraging as it shows that employees view the use of IS as a form of job enrichment in terms of skill variety. The results also indicate that higher prosocial values of employees strengthen the positive relationships of use of IS to perceived increase in task significance and perceived increase in beneficiary contact. As explained earlier, nurses with higher prosocial values are more likely to perceive and appreciate job enrichment in task significance and increase in beneficiary contact as a result of using the healthcare IS. Employee self-efficacy with the system was also shown to be a determinant of perceived increase in skill variety, task identity, task significance, and beneficiary contact, thus emphasizing the importance of training to boost the confidence of workers in using the system. Further, perceived increase in task identity is found to influence individual impact. Increasing task identity through the use of IS gives employees a stronger sense of control and responsibility, thus improving their job performance. Last, perceived increase in beneficiary contact is positively related to individual impact. Increasing the frequency and quality of contact with patients through the use of IS helps nurses to perceive improved job impacts.

The results also show that the use of IS is not significant in increasing perceived task identity. Qualitative feedback from the nurses suggests that there are teething problems with using the EMAS, causing the task process to be less smooth than expected. This may affect the nurses’ perceived increase in task identity. Findings also show that perceived increase in skill variety is not significant in increasing individual impact. While nurses may feel that the use of IS increases their skill set, the additional IT skills may not contribute to their efficiency or effectiveness in serving patients. Last, perceived increase in task significance does not increase individual impact. While increased task significance may help the nurses feel better about their job, it does not appear to improve their performance.
Table 1. Descriptive Statistics, Correlation Matrix, and Average Variance Extracted

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Mean (SD)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Individual Impact</td>
<td>4.25 (1.42)</td>
<td></td>
<td>0.87</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2. Use of IS</td>
<td>5.60 (0.89)</td>
<td>0.10</td>
<td></td>
<td>0.92</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Prosocial Values</td>
<td>6.31 (0.73)</td>
<td>0.16</td>
<td>0.13</td>
<td></td>
<td>0.84</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Self-Efficacy</td>
<td>5.13 (1.24)</td>
<td>0.40**</td>
<td>0.14</td>
<td>0.27*</td>
<td></td>
<td>0.85</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Perceived Inc in Skill Variety</td>
<td>5.24 (1.12)</td>
<td>0.41**</td>
<td>0.27**</td>
<td>0.06</td>
<td>0.28**</td>
<td></td>
<td>0.90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Perceived Inc in Task Identity</td>
<td>4.17 (1.54)</td>
<td>0.82**</td>
<td>0.09</td>
<td>0.24*</td>
<td>0.44**</td>
<td>0.38**</td>
<td>0.96</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Perceived Inc in Task Significance</td>
<td>4.56 (1.32)</td>
<td>0.67**</td>
<td>0.12</td>
<td>0.23*</td>
<td>0.28**</td>
<td>0.53**</td>
<td>0.68**</td>
<td>0.89</td>
<td></td>
</tr>
<tr>
<td>8. Perceived Inc in Beneficiary Contact</td>
<td>4.11 (1.62)</td>
<td>0.82**</td>
<td>0.08</td>
<td>0.22*</td>
<td>0.29**</td>
<td>0.44**</td>
<td>0.84**</td>
<td>0.77**</td>
<td>0.95</td>
</tr>
</tbody>
</table>

* Significant at p < 0.05; ** Significant at p < 0.01. The diagonal elements (in bold) represent square root of AVE.

Figure 2. PLS Results for Proposed Research Model

The findings show that the job characteristics and the relational job design theories can be used to explain the impact of IT on job performance. Past studies on the impact of computer systems on users (mostly in middle management or supervisory positions) show that computer systems increased task significance and identity but not skill variety (Ryker and Nath 1995). Interestingly, our study shows that nurses perceive an increase in skill variety from the system use and this could be used as a form of job enrichment to encourage nurses to use IT systems. Our study is novel in terms of applying the perspective of relational job design to information systems and introducing constructs such as beneficiary contact, which are appropriate in the healthcare context. This allows healthcare organizations to better understand and harness the use of IT.

Limitations and Future Work

The sample size is currently limited by the number of wards that EMAS has been rolled out to. The future plan is to study more wards to increase the sample size. The research model can be tested with other healthcare IS and in different hospital settings. Current findings are based on survey data only, but future research could include other proxies to measure IT impact.

Expected Outcome and Contribution

Through this study, we aim to contribute to IS literature by studying in depth the role of an IS to improve individual work, a relatively less understood phenomenon. We explain the link between IS use and individual impact by exploring how system use may change job characteristics and thereby affect individual work. The preliminary results of this study have demonstrated the utility of organizational theories such as the job characteristics model and the relational job design model to understand the use of IS and its impact on individual work. Further, this study adds to the limited IS research in the healthcare context where IT has the potential to effect substantial benefits. Practically the study can offer insights into how IS may be deployed to positively impact individual work particularly in healthcare organizations.
Acknowledgments

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References


