Association for Information Systems

AIS Electronic Library (AISeL)

ACIS 2012 Proceedings

Australasian (ACIS)

2012

The View from the Trenches: Satisfaction with eHealth systems by a group of health professionals

Leigh Ellen Potter
Griffith University, l.potter@griffith.edu.au

Cole Purdie
Griffith University, C.Purdie@griffith.edu.au

Sue Nielsen
Griffith University, s.nielsen@griffith.edu.au

Follow this and additional works at: https://aisel.aisnet.org/acis2012

The View from the Trenches: Satisfaction with eHealth systems by a group of health professionals

Leigh Ellen Potter
Cole Purdie
Sue Nielsen
School of Information and Communication Technology
Griffith University
Nathan, Australia
Email: L.Potter@griffith.edu.au; C.Purdie@griffith.edu.au;
S.Nielsen@griffith.edu.au

Abstract

The integration and adoption of eHealth systems within the health sector faces challenges. As health care practitioners are the end users of eHealth systems, their perceptions of these systems are critical in order to address the issues surrounding their implementation and application. This paper presents the views that a group of health care professionals hold regarding the eHealth systems that they use as part of their day to day work. These views were analysed according to the perceptions of satisfaction and dissatisfaction with eHealth systems that these professionals expressed. They expressed satisfaction with the information consistency, work efficiency, access to information, quality of information, and availability of technical support associated with their systems use. They expressed dissatisfaction with a lack of communication and compatibility between systems, deficiency in terms of system functionality, a lack of system reliability, a lack of initial and ongoing training, and a need to develop workarounds in order to achieve work goals. Overall this research indicates that satisfaction with eHealth systems is a complex issue, and that the negative aspects of system satisfaction need to be addressed and the positive aspects carefully built upon.

Keywords

eHealth, user satisfaction.

INTRODUCTION

eHealth systems continue to face challenges in integration and adoption within the health industry, (Glasgow 2007; Murray et al. 2011; Omary et al. 2009; Tsiknakis and Kouroubali 2009). Health professionals may be required to use eHealth systems in their practice for the benefit of their patients. The perceptions of these individuals can ultimately influence the success or failure of their information system (DeLone and McLean 2003; Goodhue and Thompson 1995; Hirschheim and Klein 1989). As such, understanding the perceptions of eHealth system users is integral to understanding the success or failure of adopting and implementing eHealth systems.

There are a range of potential obstacles to the successful introduction of eHealth systems, including legal and governmental regulations, legislation, accepted and applicable standards and guidelines, language differences, traditions, ethical issues, licensing, privacy issues, tax and insurance issues, and international differences within the health sphere (Jordanova and Lievens 2011) . Additionally, eHealth literacy, or "the ability of people to use emerging information and communications technologies to improve or enable health and health care" (Neter and Brainin 2012) can influence an individual's ability and capacity to interact with eHealth systems.

eHealth systems are of course available to both health practitioners and patients. Existing research has explored the interaction between patients and eHealth systems in terms of ease of use and the skills required to access these systems (Chan and Kaufman 2011; Neter and Brainin 2012) and in terms of patient satisfaction with aspects of these systems (Agha et al. 2009; Koo et al. 2011).   Research describing the satisfaction of healthcare workers with eHealth systems is harder to find. This paper seeks to address part of this lack by focusing on the relationship between eHealth systems and the healthcare practitioners that use them.

This paper discusses some of the findings from a larger study which investigated the perceptions of eHealth systems by a group of health practitioners. In this paper we focus on the level of satisfaction felt by these health practitioners with the eHealth systems that they use. User satisfaction models exist in other fields including data processing, end-user computing, eGovernment (Verdegem and Verleye 2009), and Enterprise Resource Planning

(Longinidis and Gotzamani 2009). However at present there is not a model for eHealth. This paper seeks to add to research in this area by exploring the perceptions of a group of health care practioners with eHealth systems. The focus is therefore on the practitioner's view.

This paper will present a brief definition of eHealth and user satisfaction, followed by an overview of the case study used and the participants within the case study. The views of a group of health care practitioners will be presented according to positive and negative views. This will then allow for a set of system aspects to be discussed according to practitioner satisfaction and dissatisfaction.

CONCEPTS

In order to discuss the perception of satisfaction by health professionals of eHealth technology, an explanation of the terms is needed.

eHealth

Many terms are used to include the use of technology in relation to the broader health field, including telemedicine, telehealth, health informatics and eHealth. Broadly, terms such as telemedicine appear to relate to technologies supporting active provision of health care (Tulu et al. 2005), whereas terms such as eHealth appear to refer more to the use of internet based technologies in the provision of information and services (Eysenbach 2001).

According to Eysenbach (2001) it is important for the term eHealth to not be seen as a "buzzword", and for there to be a clear definition of what eHealth entails in order for proper research surrounding this area to be conducted. Defining exactly what eHealth encompasses is also important for knowing how eHealth itself will grow as well as how it will change the industry around it (Pagliari et al. 2005). Eysenbach (2001) defines eHealth as the following: "e-health is an emerging field in the intersection of medical informatics, public health and business, referring to health services and information delivered or enhanced through the Internet and related technologies. In a broader sense, the term characterizes not only a technical development, but also a state-of-mind, a way of thinking, an attitude, and a commitment for networked, global thinking, to improve health care locally, regionally, and worldwide by using information and communication technology."

Satisfaction

Bailey and Pearson (1983) define user satisfaction as the feeling obtained from the positive and negative reactions an individual has to a set of factors within a given situation. User satisfaction in an information systems context then may refer to an individual's positive or negative response to an information system. Chatterjee, Chakraborty, Sarker, Sarker and Lau (2009) support this by describing user satisfaction as "the extent to which the user is satisfied with his/her interaction with the system."

DeLone and McLean (2003; 1992) placed user satisfaction within a larger context when they conceptualised the factors that contributed to the quality and success of an information system with the D&M IS Success model. They suggest that the three dimensions of information, systems and service quality will affect the way in which individuals use an information system, and their satisfaction with that system. Where the use of a system is compulsory, as it is for the participants in this research, DeLone and McLean (1992) suggest user satisfaction is an appropriate measurement to use in assessing the success of system.

Bailey and Pearson (1983) explored user satisfaction in detail with their User Satisfaction Tool covering 39 different factors relevant to user satisfaction. The factors include management involvement, the relationship with information technology departments, technology specific attributes such as accuracy and timeliness, and individual attributes including understanding of the system, confidence in the system, and feeling of participation with the system and support staff.

RESEARCH APPROACH

The research presented here is part of a larger study exploring the perceptions of health practitioners of eHealth systems. This paper focuses specifically on the level of satisfaction felt with eHealth systems from the point of view of a group of health professionals. These feelings of satisfaction were viewed from the point of view of the participants in this research. The focus was on the individual perceptions of the participants, and the research was therefore conducted qualitatively using an interpretive approach.

A group of health professionals working in Southeast Queensland in 2011 were interviewed using open ended, semi structured interviews. This interview process was supported by a small questionnaire to establish the

context surrounding the interviewee's role in the health industry. The approach taken allowed for the exploration of the personal views and opinions of the participants.

Thematic analysis of the interview data was undertaken in order to identify patterns within the interviews (Braun and Clarke 2006). Each interview was analysed individually in order to identify areas or issues that the interviewee identified as important in terms of satisfaction. Cross interview analysis followed in order to identify common themes from the interviews as a whole. This process identified positive views, negative views, and prior experience as key areas of interest when exploring feelings of satisfaction with eHealth systems from this group of participants. Within these three broad groupings specific themes were identified, covering a range of areas of satisfaction including information quality, information access, support and training, reliability, functionality, and the experience individuals had using technology.

This paper presents the perceptions of the health professionals who were interviewed focusing on their level of satisfaction with systems they use. The paper presents the participants perceptions following the key themes identified grouped as both positive and negative perceptions.

Case Study Overview

In order to access a variety of opinions for this phase of the study, the participants in this case were sourced from three different health institutions within southeast Queensland and represented a variety of roles within their institutions. This pilot research was limited to five participants in order to meet the time constraints of the larger project. Participants were selected to represent a range of work roles, work level, and experience using network sampling through mutual acquaintances within the health industry. It is acknowledged that this is a small number of interviewees, however the objective in this instance was to gain a deeper understanding of the perceptions of a small sample of professionals, which could be followed up by a more extensive study. The perceptions are acknowledged to be indicative of the views of one small group, and further work is required to extend these findings across a broader population.

A summary of the participants is shown in table 1. These participants have been identified using pseudonyms for confidentiality.

Table 1. Participant Summary

Name	Role	Work area	Systems used daily	Primary System Used	Years in Industry
Anne	Paramedic	Pre-hospital, emergency care, patient transfer, and paramedic training.	5	Mobile patient tracking and care system deployed on a laptop style device. It includes a patient care database, a logistics tracking system, and a medical information database.	9
Trish	Researcher/ Director	Liaise and coordinate health resources, research resource options, and oversee pharmaceutical dispensary	>4	Pharmaceutical stock and tracking system, and Pharmaceutical care system that does not interact with the stock and tracking system. It monitors and manages drug use and access and includes detailed patient medicine strategies and medical history	30
Erin	Practitioner /Director	Liaise and coordinate health resources, work with the in-house technology team, medication purchasing, and the dispensary	15		30
Louis	Nurse/ Technician	Instrument tracking, dispensary work, surgical preparation, instrument sterilisation, and maintenance.	3	Surgical instrument asset management system. Identification, management, use monitoring, and logging and tracking of service requirements for surgical instruments.	32
Baker	Nurse	Caretaker in a medical ward, including procedure and equipment tracking and patient care.	4-5	Patient record and tracking system for tracking patients and surgery	2

Four of the participants were keen to participate in the research. Apart from Baker, the youngest participant, they were all able to describe their use of the systems in detail and used emotive language in discussing their experiences.

All but one participant indicated that Information Technology had been a part of their role within healthcare for a large portion of their time employed. Louis stated that of the thirty-two years he had been within his role, only ten have included reliance on an Information System. All participants indicated that they felt their job is benefitted by the presence of eHealth systems and yet all participants also indicated that they felt the use of the systems had drawbacks within their role.

POSITIVE PERCEPTIONS

The participants described a range of positive feelings or experiences towards the eHealth systems they use with comments stating that they liked their system (Baker) or were happy with the way they used their system (Louis). Their views were grouped and the common themes of consistency, efficiency, information access, information quality, and availability of support emerged.

Consistency of work produced

Anne stated that the predecessor to the eHealth system she uses was a "report form that had job information and details and then a big white box where you could write or draw anything", whereas the eHealth system supported consistency in the paperwork required for the job across the workforce. Louis also described this feature of the eHealth system that he used as a benefit, stating that "it's a lot clearer and it's a lot easier to understand".

Information quality

Louis stated that the system he used "retains information on deleted records and mistakes made" allowing better control of information. Anne described a benefit of her system as "you can only access cases that you've attended. It helps because you shouldn't be looking at case details unless you were there." Baker stated that her system "makes it a lot easier to keep track of other people's paper work as well." Louis described her system as tracking information entries according to the staff member who had made the entry, stating that "everyone can see what you've done so there is a lot more accountability. You have to take responsibility for everything you do", adding that "I think it's a positive thing."

Alongside this was the perception that the systems encouraged a common standard for the information entered. Anne described the eHealth system she used as "a computer system to standardise all of our patient care records" and that "everyone has a standard for their paperwork". Erin stated that "people have realised everything needs to be standardised." Trish stated that the introduction of one of the eHealth systems she worked with was "an attempt, with the drive being patient safety, for hospitals to work collectively together with a national interest to come up with criteria." Both Erin and Trish described a need for standards for eHealth systems: Erin stated that "we have to produce a standard that will allow us to communicate between systems and share information between systems" and Trish stated that "we need to develop a national standard operating procedure to be able to apply to systems."

Efficiency

Anne, Baker, Louis and Trish all described increased efficiency as a benefit brought by the eHealth systems that they used. Anne provided a detailed example: the patient care record system provided "a better way to store the records because this gets uploaded wirelessly at the end of every shift. Within two days we can log on and access jobs we'd been to whereas previously we'd have to access physical folders and stations records...It also means when we're going through doing clinical audits on cases it's all done electronically." Baker stated that the tracking system she used "saves time for most nurses" and "speeds the patient processing up a lot." Louis stated that the system was "a lot clearer and it's a lot easier to understand" and described benefits in terms of time savings. A critical improvement that the eHealth system provided was a reduction in sterilization incidents: "in the past because of the nature of sterilisation there have been incidents, not just in our hospital, but in all hospitals due to human error. This system cuts down human error because we are tracking things."

Information access

Access to information was cited as a benefit provided by eHealth systems. Anne described the information databases such as drug calculations included in the system she uses as 'helpful', particularly for junior staff, and added that "all the databases of information, having easy access to that kind of stuff is great." However she also stated that some key information was missing from these databases, such as "poisons information, which is pretty important". She also cited the ability to access electronic patient records after an event as a benefit. Louis described the availability of information and openness of information sharing within the instrument tracking system as "a positive thing". For her use of the system the primary benefit was information tracking.

Availability of support

A practical aspect that was described as important for using eHealth systems was the availability of technical support and training. Anne stated that she had access to "a 24 hour number if the computer shuts down and freezes which is helpful." Baker said "they usually have training sessions that you can attend. These sessions are pretty informative and helpful." Louis described the availability of an expert provided by the software company "for a couple of days" for training in a large system update. However she also stated that only 'two or three of us' were trained, and that it was then their responsibility to train other staff in the department.

NEGATIVE PERCEPTIONS

The participants described a range of negative feelings or experiences towards the eHealth systems they use. Their views were grouped and the common themes of communication between systems, missing functionality, reliability of systems, lack of training, and the development of 'workarounds' in order to achieve work goals emerged. These will now be discussed.

Communication between systems

A major issue discussed by most of the participants was a lack of communication or integration between eHealth systems. The system used by Anne synchronises from the unit (ambulance) to the main system at the ambulance

station, however is does not "talk unit to unit like if we're transferring a patient over to someone else", and it does not communicate with the hospital systems: "paper work generally takes about half an hour to complete. We do it in the vehicle on the way and finalise when we are at hospital, print a copy out, hand it to the hospital." She raised this issue several times and in detail, discussing duplication of paperwork when more than one ambulance attends a scene, and issues with communication: "Connecting between systems would be beneficial….A hospital interface would be really good, so we could transfer information directly to the hospital."

Erin described difficulties with information processing: "there is information that overlaps between the two systems. In an ideal world, we would have one system that could cater for every function of these 15 different pieces of software we currently have to use." She described difficulties with transferring information between systems where information must be manually entered: "Unfortunately, the quality of the information would be questionable...It can be largely attributed to the information going from one electronic system, to a paper based record, and then into another electronic system, or any combination of those. It is very inadequate in terms of clinical management of a patient. By the time a patient's information makes it to a pharmacist, it's gone through up to two physical and three electronic iterations... These documents and records currently undergo several changes throughout a patient's cycle within a hospital, being translated to a different system each time… I can't get data between the different stages of a patients care through just one system." This issue mirrors the experience described by Anne where patient records are transferred on paper printouts and is compounded for Erin by the need for duplication across different systems: "when they use the system, the pharmacy will go to enter the information into [their system] but that won't transfer it to my [system]. The two systems aren't talking to one another. I can only enter my information into one system unless I want to duplicate everything so I need to pick which system I am going to enter my information into." This means that the staff either have to manually enter the same information into multiple systems, or they choose one system which leads to complications further in the patient care cycle.

This experience is repeated by Trish, who described a second aspect to the patient transfer experience previously discussed by Anne, which is the experience of staff receiving patients arriving at the hospital: "so say a patient comes into hospital, they have a record from their local practitioner that won't come in a format that can be absorbed electronically into a system if the hospital had it. So there'll be a piece of paper, and it will say what the patient may have been on prior to coming in. Then the Doctor, maybe the nurse, and then the pharmacist, will then ask all those questions of the patient again and enter our own version of our information into those manual sources. And that's just at the point of coming in. It's difficult to reconcile an accurate 'best possible' summary of medication history sometimes." Trish stated that "everybody has their isolated little bits of systems but there is no system that all staff can access", and that "that means double handling nearly all our information." Trish also described issues in terms of system access: "when a pharmacist cares for a patient, they write on the medicines chart… most of their housekeeping isn't accessible to the rest of the staff… And nobody else can see this system but the pharmacists."

All of the participants expressed a desire for greater interconnectivity between systems to improve efficiency, streamline transfers, and reduce errors.

Missing functionality

Many of the participants described frustration in relation to the system not meeting their work requirements in terms of functionality. Anne stated that the patient transfer system that she uses was purchased from interstate and that "they still have the other states' ambulance logo and branding on the system." No modifications were made to the system on transfer between states, and Anne stated that "they bought a flawed system…it doesn't really fit our criteria." A number of participants expressed a desire for new functionality in their systems, or described functionality changes that were detrimental to work efficiency. Related to this were delays in functionality change requests, such as that described by Louis "we told them back in May, this is a pain in the backside and they are going to write and update but it's not happened yet." Trish described this requirements gap in detail: "To get enhancement to add functionality is incredibly hard and time consuming and expensive, and you could wait three years for these improvements to come through…To me it's that absolute frustration with I know what I want the system to do, I've identified a gap in the data collection and calibration method and I can't make the system do what I want…It's not just a lack of accuracy with our requirements being collected, it's that they aren't being collected."

Reliability of systems

Widely cited by the participants were problems with the reliability of the systems they use, and the disruption this causes to their work with several individuals specifically stating that the systems needed to be more reliable. Anne stated that "There's times when I want to throw it out the window of the car. It stalls when crews don't synchronise it and update the information, it tends to freeze quite badly. Battery life isn't really good, we've got

chargers in vehicles but they have quite a tendency to stop at any given moment." System failures of this kind have several flow-on effects: junior staff who require access to the online information databases "get quite frustrated, because they want to be able to look things up and they need to be able to do that", and "if a system hangs we have to reset it. But if you're working on a job and it stalls, you have to reset the machine and you lose all the information you've entered." The onus is on the crews to "go through and clean out their system after the shift." Baker listed similar reliability problems with the system she uses stating that "it can freeze and reset your password" and that "when it breaks down it takes a very long time for it to be fixed. This is a really bad issue because there are a lot of things we can't do while the system is broken down." Louis was the only participant who specifically mentioned the online nature of the system as a negative, stating that since the system had gone online "we have a slight time delay and it will go to sleep sometimes and we get a few hiccups." He said that "the people who are interacting with the system all day everyday find a lot of issues."

Trish described a lack of fit between the pharmacy system she uses and the environment where it is deployed: "if it were in a community pharmacy, it wouldn't be clunky…we have 70+ operators and 100 times more stock than a local pharmacy…it's a quagmire. The more networked and the bigger the operation, the less responsive this system is… the system is very old and lags a lot. If more than a dozen people are using it, it becomes detrimental to efficiency because of how slow it is."

Lack of training

Several participants described a lack of training in how to use the eHealth systems, either initially or for new employees. Anne stated that "new students coming through don't get a lot of training with these computer systems." Louis described a situation where "when it first came on we didn't have much training for the original model - it was more just introduced and we just learnt from each other… we didn't have anyone to support us but I think one person was told from the beginning and then the knowledge kind of spread." A second issue in relation to training was the shift work nature of health professionals and the timing of training. Baker stated that "the most frustrating part of this it that [the training sessions] are generally in your own time!" and Trish said that "the training people will say 'we'll run a course in X time slot in X day. Will you be available for this course?' How can you plan to be able to go to that when you don't know your roster? It's difficult."

Workarounds

Erin, Louis and Trish described the development of workarounds, or different techniques they had developed to work around the functionality of the system in order to achieve their work goals. Erin stated that "I'm using many different systems to patch up the functionality that I require." Louis described the actions of a colleague to track change requests: "she puts it onto an email and that email is one of those that she just keeps adding to so that other people who do the job [and encounter an issue] can refer back to it and see if it's been reported or not." Trish stated that "The computer forces you to work differently to what you would necessarily want to work. Sometimes you spend your life working around the computer to achieve what you want." She described an internal database that her department has developed "to keep track of what we upload to the government system because the government system we have to upload our information too doesn't provide any feedback once we send reports off, and doesn't let us track our reports."

Information Technology Experience

A number of participants discussed prior experience with information technology as an influence on the level of comfort an individual may have with eHealth systems. Anne commented that "we are getting a lot of university graduates now who are a lot more comfortable on the system - because all of their training has been like that." She stated that "I know my way around this system fairly well though, I've been using it every day for years", however "I still hate the thing." Baker is herself a young nurse and describes her system as "very easy to use. If you know how to use a computer you find it very similar to other computer programs." Louis stated that the biggest downside to the eHealth system was "learning to use the computers. I don't know how to use a computer. A lot of the staff when we first got it were older. None of us had been brought up with computers. The majority of the younger staff are quite fine." Trish stated that "you've got the new generation of IT receptive people coming into the hospital as the years continue...What's improved is the quantity of IT enabled people."

CONCLUSION

Overall this research indicates that satisfaction with eHealth systems is a complex issue as the participants did not clearly differentiate their satisfaction with the eHealth artifact ('system') from their satisfaction with information input to the system or contextual factors such as training and support. This is consistent with Eysenbach's(2001) definition which includes notions such as commitment and a way of thinking. Moreover,

since the use of such systems are generally compulsory and are viewed by participants as contributing to or detracting from patient care, satisfaction needs to be defined differently from cases where system users have a different relationship (commercial, etc) with their clients. The negative aspects of system satisfaction therefore need to be attended to and the positive aspects carefully built upon.

The interview participants described eHealth systems in both positive and negative terms. Common themes emerged from the interviews indicating that the participants perceived eHealth systems to bring benefits in terms of information consistency, work efficiency, access to information, quality of information, and availability of technical support. These are consistent with some of the user satisfaction factors identified by Bailey and Pearson (1983), specifically information accuracy and reliability, job effects, information timeliness, information precision, and vendor support. In terms of these aspects the participants were satisfied with the eHealth systems that they used. eHealth was perceived to improve the consistency of both information provided and work approach, and to improve the efficiency of work flow. Information was perceived to be easier to access and to be more consistent due to the introduction of standardization. Individuals were now held more responsible for their work and greater tracking of tasks and information was available. Several participants expressed satisfaction with the technical support that was available to them.

In contrast to this, a range of themes were raised relating to the negative aspects of the eHealth systems in use, including a lack of communication and compatibility between systems, deficiency in terms of system functionality, a lack of system reliability, a lack of initial and ongoing training, and a need to develop workarounds in order to achieve work goals. These are consistent with some of the user satisfaction factors identified by Bailey and Pearson (1983), specifically integration of systems, systems relevancy, and degree of training. The issue of developing workarounds is not included in their model, and represents a behavior that may be indicative of satisfaction with a system. The participants were extremely dissatisfied with the lack of communication and compatibility between systems, with this attribute seen to actively hinder the successful completion of their work. Similarly, the participants perceived a lack of reliability in the eHealth systems, again citing this as a serious hindrance and issue for their work practice. The participants expressed a level of dissatisfaction with the functionality of the systems they used, and a frustration with efforts to improve the systems or introduce new functionality. These perceived flaws influenced the development of workarounds by some staff in order to complete their required work within the functionality of the eHealth systems. In contrast to the perceived satisfaction with the availability of technical support, several participants were dissatisfied with the provision and availability of training.

In addition to these areas of satisfaction and dissatisfaction with eHealth systems, the theme emerged of a perception of experience with information technology as an influence on the acceptance and level of comfort of individuals with eHealth systems. It was perceived that younger staff who had more exposure to and experience with technology were also more comfortable and more satisfied with the systems. One participant in this research is in this category, and while she did express satisfaction with her use of the system, she also expressed the same dissatisfaction with the perceived lack of reliability of the system she used as the other participants did of the systems they used. Further research with this younger staff group is required in order to fully explore this theme.

From this research it can be seen that while eHealth systems are bringing many benefits to the work flow and practices of these health care practitioners, there is a need for further development of the technology in order for it to fulfil its potential and truly achieve a categorisation of success as indicated by user satisfaction with eHealth systems.

REFERENCES

Agha, Z., Schapire, R.M., Laud, P.W., McNutt, G., and Roter, D.L. 2009. "Patient Satisfaction with Physician-Patient Communication During Telemedicine," *Telemedicine and e-Health* (15:9), p. 10.

Bailey, J.E., and Pearson, S.W. 1983. "Development of a Tool for Measuring and Analyzing Computer User Satisfaction," *Management Science* (29:5), pp. 530-545.

Braun, V., and Clarke, V. 2006. "Using Thematic Analysis in Psychology," *Qualitative Research in Psychology* (3:2), p. 41.

Chan, C.V., and Kaufman, D.R. 2011. "A Framework for Characterizing Ehealth Literacy Demands and Barriers," *Journal of Medical Internet Research* (13:4).

Chatterjee, S., Chakraborty, S., Sarker, S., Sarker, S., and Lau, F.Y. 2009. "Examining the Success Factors for Mobile Work in Healthcare: A Deductive Study," *Decision Support Systems* (463:3), p. 14.

DeLone, W., and McLean, E.R. 2003. "The Delone and Mclean Model of Information Systems Success: A Ten-Year Update," *Journal of Management Information Systems* (19:4), Spring 2003, pp. 9-30.

DeLone, W.H., and McLean, E.R. 1992. "Information Systems Success: The Quest for the Dependent Variable," *Information Systems Research* (3:1), pp. 60-95.

Eysenbach, G. 2001. "What Is E-Health?," *Journal of Medical Internet Research* (3:2), Apr-Jun 2001.

Glasgow, R.E. 2007. "Ehealth Evaluation and Dissemination Research," *American Journal of Preventative Medicine* (35:5 supplement), p. 8.

Goodhue, D.L., and Thompson, R.L. 1995. "Task-Technology Fit and Individual Performance," *MIS Quarterly* (19:2), p. 24.

Hirschheim, R., and Klein, H.K. 1989. "Four Paradigms of Information Systems Development," *Communications of the ACM* (32:10), pp. 1199-1216.

Jordanova, M., and Lievens, F. 2011. "Global Telemedicine and Ehealth (a Synopsis)," in: *3rd International Conference on eHealth and Bioengineering*. Romania: IEEE.

Koo, C., Wati, Y., Park, K., and Lim, M.K. 2011. "Website Quality, Expectation, Confirmation, and End User Satisfaction: The Knowledge-Intensive Website of the Korean National Cancer Information Center," *Journal of Medical Internet Research* (13:4).

Longinidis, P., and Gotzamani, K. 2009. "Erp User Satisfaction Issues: Insights from a Greek Industrial Giant," *Industrial Management & Data Systems* (109:5), p. 18.

Murray, E., Burns, J., May, C., Finch, T., O'Donnell, C., Wallace, P., and Mair, F. 2011. "Why Is It Difficult to Implement E-Health Initiatives? A Qualitative Study," *Implementation Science* (6:6), p. 11.

Neter, E., and Brainin, E. 2012. "Ehealth Literacy: Extending the Digital Divide to the Realm of Health Information," *Journal of Medical Internet Research* (14:1).

Omary, Z., Mtenzi, F., and Wu, B. 2009. "How Does Politics Affect Electronic Healthcare Adoption," *4th International Conference for Internet Technology and Secured Transactions*, London: IEEE.

Pagliari, C., Sloan, D., Gregor, P., Sullivan, F., Detmer, D., Kahan, J.P., Oortwijn, W., and MacGillivray, S. 2005. "What Is Ehealth: A Scoping Exercise to Map the Field," *Journal of Medical Internet Research* (7:1), p. 9.

Tsiknakis, M., and Kouroubali, A. 2009. "Organizational Factors Affecting Successful Adoption of Innovative Ehealth Services: A Case Study Employing the Fitt Framework," *International Journal of Medical Informatics* (78:1), p. 14.

Tulu, B., Chatterjee, S., and Laxminarayanm, S. 2005. "A Taxonomy of Telemedicine Efforts with Respect to Applications, Infrastructure, Delivery Tools, Type of Setting and Purpose," in: *38th Annual Hawaii International Conference on System Sciences*. IEEE.

Verdegem, P., and Verleye, G. 2009. "User-Centred E-Government in Practice: A Comprehensive Model for Measuring User Satisfaction," *Government Information Quarterly* (26:2), p. 11.

COPYRIGHT