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The Usage of the Intranet and its Impact on Organisational Knowledge Sharing: An Exploratory Investigation of a Public Hospital

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Certificate of Authorship/Originality

I certify that the work in this thesis has not been previously submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I received in my research work and preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

Signature of Candidate

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DEDICATION

Dedicated to my parents, Dr. Abdullah Jibril Oyekan and Hajiya Fatima Mahmud-Oyekan whose love for seeking and imparting knowledge continue to be a source of inspiration to me

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LIST OF ACRONYMS

ABS: Australian Bureau of Statistics

ACS: Australian Computer Society

ADX: Australian Derivatives Exchange

AHCRA: Australian Health Care Reform Alliance

AHP: Allied Health Professionals

BPR: Business Process Re-engineering

CINAHL: Cumulative Index to Nursing and Allied Health

CoI: Communities of Interest

CoP: Communities of Practice

E-mail: Electronic Mail

EMR: Electronic Medical Records

ERP: Enterprise Resource Planning

FAQ: Frequently Asked Questions

GDP: Gross Domestic Product

GP: General Practitioner

HTML: Hypertext Markup Language

HTTP: Hypertext Transfer Protocol

HR: Human Resources

HIMSS: Healthcare Information and Management Systems Society

HIS: Hospital Information System

IBM: International Business Machines

IT: Information Technology

ITS: International Treasury Services

IS: Information Systems

KM: Knowledge Management

LAMP: Linux Apache MySQL PHP

LDAP: Lightweight Directory Access Protocol

MCP: Microsoft Certified Professional

MCSE + I: Microsoft Certified Systems Engineer + Internet

MEDLINE: Medical Literature Analysis and Retrieval System Online

NEHTA: National E-Health Transition Authority

NOIE: National Office of the Information Economy

NSW: New South Wales

NSW Health: New South Wales Health Department

OECD: Organisation for Economic Cooperation and Development

PBS: Pharmaceutical Benefits Scheme

PC: Personal Computer

PDF: Portable Document Format

PHP: Hypertext Preprocessor

PUMA: Public Management Service

ROI: Return on Investment

SD: Standard Deviation

SECI: Socialization, Externalization, Combination and Internalization

SEDL: Southwest Educational Development Laboratory

SMTP: Simple Mail Transfer Protocol

TCP/IP: Transport Control Protocol/Internet Protocol

TQM: Total Quality Management

URL: Uniform Resource Locator

UTS: University of Technology, Sydney

XML: eXtensible Markup Language

GLOSSARY

Bandwidth: How much information (text, images, video, and sound) can be sent through a connection. Usually measured in bits-per-second.

Browser: An application used to view information from the Internet. It provides a user-friendly interface for navigating through and accessing the vast amount of information on the Internet.

Browsing: A term that refers to exploring an online area, usually on the World Wide Web.

Client/Server: A relationship in which one computer program (the client) requests information from another computer program (the server), whereby the server responds in fulfilling the request.

Client/Server Architecture: The design model for applications running on a network.

CD-ROM: Compact Disk-Read Only Memory, a storage medium popular in computers.

E-mail: Electronic Mail, text files that are sent from one person to another.

Emoticons: The online means of facial expressions and gestures e.g. ☺.

Firewall: A security barrier placed between an organisation's internal computer network, usually an Intranet, and the Internet. It consists of one or more routers which accept, reject or edit transmitted information and requests.

Forms: The pages in most browsers that accept information in text-entry fields.

Gateway: A link from one computer system to a different computer system.

Hits: An action on the website, such as when a visitor views a page or downloads a file.

Home Page: The page designated as the main point of entry of a website (or main page) or the starting point when a browser first connects to the Internet. It provides links to the lower-level pages of the site.

HTML: HyperText Markup Language (HTML) is a coding language used to make hypertext documents for use on the Web. HTML allows text to be 'linked' to another file on the Internet.

HTTP: HyperText Transfer Protocol (HTTP) is the standard Internet protocol for the exchange of information on the World Wide Web.

Hyperlink: This is the clickable link in text or graphics on a web page that takes you to another place on the same page, another page or a whole other site. It is the single most powerful and important function of online communications.

Internet: A collection of over 60,000 independent, inter-connected networks that use the TCP/IP protocols. It is a worldwide system of computer networks providing reliable and redundant connectivity between disparate computers and systems by using common transport and data protocols.

Intranet: Intranets are private networks, usually maintained by organisations for internal communications, which use internet protocols, software and servers. They are relatively cheap, fast, and reliable networking and information warehouse systems that link offices around the world. They make it is easy for users to communicate with one another, and to access the information resources of the internet.

Keyword: A word or phrase used to focus an online search.

Link: An electronic connection between two websites.

Load: Refers to transferring files or software from one computer or server to another computer or server. Usually used with up-load or down-load In other words, it's the movement of information online.

Log or Log Files: A File(s) that keep track of network connections or activities.

Login: The identification or name used to access a computer, network or website.

Mailing List: An automatically distributed E-mail message on a particular topics going to certain individuals online.

Metadata: Data that describes other data.

Page Views: Number of times a user requests a page.

PDF Files: Adobe's Portable Document Format is a translation format used primarily for distributing files across a network, or on a website.

Protocol: A set of rules that govern how information is to be exchanged between computer systems.

Push: Is the delivery (‘pushing of’) of information that is initiated by the server rather than being requested (‘pulled’) by a user.

Router: The hardware or software that handles connections between networks online.

Search Engine: A program that searches documents for specified keywords and returns a list of the documents where the keywords were found. Although a search engine is really a general class of programs, the term is often used to specifically describe systems like Google that enable users to search for documents on the World Wide Web.

Server: Servers are the backbone of the Internet. These are computers that are linked by communication lines that ‘serve up’ information in the form of text, graphics and multimedia to online computers that request data.

TCP: Transmission Control Protocol works with IP to ensure that packets travel safely on the Internet. This is the method by which most Internet activity takes place.

Upload: To send a file from one computer to another via modem or other telecommunication method.

URL: Uniform Resource Locator, an HTTP address used by the World Wide Web to specify a certain site. This is the unique identifier, or address, of a web page on the internet.

Visits: A sequence of requests made by one user at one site.

Web page: A HTML document on the web, usually one of many together that makeup a website.

Webmaster: The individual assigned to administering an organisation's website.

Website: The virtual location for an organisations presence on the World Wide Web, usually making up several web pages and a single home page designated by a unique URL.

World Wide Web: The World Wide Web allows computer users to access information across systems around the world using URLs to identify files and systems and hypertext links to move between files on the same or different systems. The web is a client/server information system that supports the retrieval of data in the form of text, graphics and multimedia in a uniform HTML format.

Abstract

In this modern era, knowledge is considered a key economic resource. Its effective management is viewed as a crucial source of value and competitive advantage for organisations, by enhancing individual employee and core organisational competencies.

Knowledge-based organisations such as hospitals are prime examples of organisations where access to and the sharing of knowledge is critical. In the public healthcare industry in particular, Information Technology (IT) tools are viewed as a crucial ingredient in the functioning of healthcare services (Haux, 2006; Kankhar, 2006; Pluye et al., 2005; Ammenwerth et al., 2003). Many organisations have embraced the Intranet with the intent to harness the technology to support Knowledge Management (KM) initiatives (Oliver & Kandadi, 2006; Spies et al., 2005). Touted as the 'killer application' for knowledge management (Cohen, 1998), the Intranet is said to have the potential of enabling organisations to improve communication and collaboration among employees, thereby increasing productivity and providing significant savings in time and money. Through the efficient and effective sharing of knowledge, the Intranet can facilitate the provision of better care by healthcare practitioners and inevitably save lives.

Despite its significance, little evidence exists in the extant literature on the application of KM or IT tools such as the Intranet to support KM in public hospitals. Although the potential benefits that IT tools such as the Intranet hold in supporting KM continue to be highlighted in popular media and practitioner literatures, there have been relatively few studies on Intranet usage in supporting KM particularly knowledge sharing in public hospitals. In addition, Australian public hospitals in particularly have been viewed as

going through a ‘crisis’ (Fett, 2000). A shortage of skilled staff, increasing medical errors and under-funding has led to the need to do more with fewer resources. This has led to an increased significance in the usage of IT tools like the Intranet to support knowledge sharing. Accordingly, there is a need to gain insight into the usage and impact of the Intranet on knowledge sharing in such a dynamic and critical work environment.

Previous studies suggest that the successful adoption and usage of IT tools require certain pre-existing organisational conditions (see Berg et al., 1998; Malhotra, 2005; Al-Gharbi & Alturki, 2001). Moreover, Ang et al. (2001) in a study on IT usage in the public sector found organisational factors to have a greater influence on the use of IT than other factors. In the area of health, organisational issues need to be taken into consideration as they account for many of the difficulties and failures involving IT implementation and usage (Haux, 2006; Andersson et al., 2003; Berg, 2001; Berg, 1999). Although there are no specific set of organisational issues (Berg, 1999), there are key enabling conditions that more commonly tend to be in place in an organisation for the effective usage and impact of IT tools such as the Intranet. Researchers (i.e. Mantzana & Themistocleous, 2005; Snis & Svensson, 2004; Ammenwerth et al., 2003) identify culture and structure in particular as crucial factors for the effective usage of IT.

An exploratory empirical case study comprising of three phases was adopted for this research. A combination of quantitative and qualitative research methods were designed and conducted to answer the following research questions:

1. What is the nature of the Intranet used at the hospital?

2. How is the Intranet used at the hospital?

3. What is the impact of the Intranet on knowledge sharing within the hospital?

4. What are the factors influencing the usage of the Intranet for knowledge sharing within the hospital?

The first phase of the research gathered background information on the research setting and enabled an understanding of the structure and operations of the hospital and the Intranet. This phase involved a combination of preliminary interviews with key IT personnel involved in Intranet administration and development, personal observations by the researcher, usage and features demonstrations of the Intranet and a review of key hospital documents (e.g. annual reports, strategic plans and Intranet logs).

The second phase of the research explored the opinions of respondents towards various issues relating to the usage of the Intranet in the hospital. An online questionnaire was administered with a combination of closed and open-ended questions. A large number of users were able to share their opinions on the advantages and disadvantages of using the hospital Intranet. Research findings from this phase identified some key difficulties. These were investigated in the third and final phase of the case study.

The third phase of the research involved a further investigation of the difficulties experienced by Intranet users in the previous phase using a qualitative approach involving semi-structured in-depth interviews. This phase also examined the Intranet's impact on the modes of knowledge sharing as represented in Nonaka & Takeuchi's (1995) knowledge conversion model.

The overall results of the research revealed that the Intranet is part of an eclectic mix of knowledge sharing mediums used at the hospital. Of critical importance and popular usage by employees was human-based knowledge sharing mediums such as face-to-face conversations. The findings indicate that these collegial modes of discourse and learning are valuable, particularly in the sharing of tacit knowledge that is crucial in such a dynamic work environment. It importantly highlights the oral nature of the medical profession and the versatility in knowledge sharing at the hospital, an aspect that is continuously emphasised as critical in other professions.

In addition, the various features of the Intranet were found to enable communication and collaboration within the hospital. The results of the research showed that the Intranet positively impacted on knowledge sharing by influencing the socialisation, externalisation, combination and internalisation modes of the Nonaka & Takeuchi's (1995) knowledge conversion model. However, this impact was limited by certain technical and non-technical factors. Accordingly, the need was demonstrated to enhance the integration of the Intranet with popular knowledge sharing mediums such as face-to-face conversations. The Intranet could supplement these mediums by facilitating collegiality over distances, asynchronous time communication and collaboration, multiple contacts and permanent records. This was expected to ensure the sustainable usage of the Intranet for knowledge sharing.

The results also importantly uncovered several enabling and impeding factors influencing the usage and impact of the Intranet at the hospital. User involvement in the development and administration of the Intranet played a key factor in its popular usage in the hospital.

Usage of the Intranet was also supported by senior management and a culture at the hospital that valued knowledge sharing. Employees viewed the hospital as one team with the common end goal of serving the children. Several impeding factors were revealed from the research as recurring themes and were categorized as technical and non-technical barriers. The most significant technical factor impeding the usage of the Intranet for knowledge sharing was poor search functionality. Others included the inability for users to personalise individual Intranet websites as well as the limitations placed by a rigid layout structure of the Intranet. Time constraints were viewed as a key non-technical factor impeding usage of the Intranet at the hospital. Other non-technical factors included the lack of a clearly-defined KM strategy, inadequate user training, a lack of user awareness of Intranet benefits for facilitating KM, inadequate staffing and high staff turnover, the influence of political policies and professional resistance.

Several researchers have drawn attention to the lack of research conducted on the usage of IT for facilitating KM and have called for more studies (e.g. Alavi, 2000; Gottschalk, 2000; Borell et al., 2001; Stoddart, 2001; Gallupe, 2001; Alavi & Leidner, 2001). Additionally, few studies have focused on the usage of IT tools to support KM in public healthcare sector organisations such as hospitals (Van Beveren, 2003). The results of the research contribute to research in this area and add to the ongoing debate on the usage, level of impact, possibilities for, and limitations of IT support for KM in such organisations. Furthermore, the thesis contributes to the even smaller body of knowledge on the usage of IT tools to support KM in public hospitals, especially in Australia where public sector organisations have been slow in adopting IT. The findings of this research

provide critical insight into the current nature and extent of Intranet usage at a public hospital and the influencing factors affecting its usage for knowledge sharing.

The methodological contribution of the research lies in the variety of approaches adopted. A combination of research methods was utilised, including a questionnaire-based survey, face-to-face interviews, personal observations, usage demonstrations of the Intranet, strategic hospital documents and Intranet log reviews and consultation with experts. This enabled an 'immersion' into the research setting and the ability to probe more deeply than is possible with singular research methods. It therefore facilitated the obtaining of rich data and facilitated a deeper understanding of the usage and impact of the Intranet on knowledge sharing in the hospital.

From a practice perspective, the research findings have important implications for the development, administration and usage of IT tools for supporting KM in public healthcare organisations in Australia. The results of this research support and extend the argument that IT tools that facilitate KM must take into consideration the technical and non-technical organisational factors that could affect usage. The results therefore highlight the importance of a knowledge sharing culture and a flexible, context-dependent structure governing the usage of the Intranet. This thesis also acknowledges the critical need for the Intranet to complement and enhance informal contacts among employees. The addressing of these issues is pivotal to realizing the full potential and benefits of advanced IT tools such as the Intranet for knowledge sharing.