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Nelson K. Y. Leung
University of Wollongong

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**Turning User into First Level Support in Help Desk:
Development of a Web-based User
Self-help Knowledge Management System**

A thesis submitted in partial fulfilment of the requirements for the award of the degree

Master of Information System (Research)

From

University of Wollongong

By

Nelson K. Y. Leung

Master of Information System, Griffith University
Bachelor of Information Technology, Queensland University of Technology

**Information Systems
School of Economics and Information Systems**

2006

Thesis Certification

CERTIFICATION

I, Nelson K. Y. Leung, declare that this thesis, submitted in partial fulfilment of the requirements for the award of the Degree of Master of Information Systems (Research) at the University of Wollongong, is wholly my own work otherwise I have given fully documented references or acknowledgement to the work of others. The document has not been submitted for qualifications at any other academic institution.

Nelson K. Y. Leung

May 2006

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Nelson K. Y. Leung

List of Publications

Leung, Nelson K. Y., Lau, S. K. and Liang, G. 2005 "The Customization of Knowledge Management Techniques in Information Technology Help Desk", in the Proceedings of The 2nd International Conference on Qualitative Research in IT & IT in Qualitative Research (QualIT) 2005, CD-ROM, 23-25 Nov., Griffith University, Brisbane, Australia, page no. 11.

Leung, Nelson K. Y. and Lau, S. K. 2005 "The Development of a User Self-help Knowledge Management System for Help Desk: Deployment of Knowledge Management Approach and Software Agent Technology", in the Proceedings of The Australasian Conference of Information Systems (ACIS) 2005, CD-ROM, 29 Nov.-2 Dec., Manly Pacific Hotel, Sydney, Australia, page no. 10.

Leung, Nelson K. Y. and Lau, S. 2005 "Knowledge Management in IT Information Technology Help Desk: Past Present and Future", in the Proceedings of The 5th International Conference on Electronic Business (ICEB) 2005, CD-ROM, 5-9 Dec., Sheraton Hotel and Towers, Hong Kong, China, pp.538-545.

Leung, Nelson K. Y. and Lau, S. K. "To Ease the Dilemma of Information Technology Help Desk: A Re-distributed Knowledge Management Model", to appear in Lytras, M. and Naeve, A. Edited, Ubiquitous and Pervasive Knowledge and Learning Management: Semantics, Social Networking and New Media to Their Full Potential, Idea Group Inc.

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List of Abbreviations

API	Application Programming Interface
CGI	Common Gateway Interface
FAQ	Frequent Asked Question lists
HD	Help Desk
HTML	Hypertext Markup Language
HTTP	Hypertext Transfer Protocol
IP	Internet Protocol
IS	Information Systems
IT	Information Technology
JDBC	Java Database Connectivity
JSP	Java Server Pages
KM	Knowledge Management
KMS	Knowledge Management System
OWL	Web Ontology Language
RDF	Resource Description Framework
SDLC	System Development Life Cycle
SQL	Structure Query Language
URL	Uniform Resource Locator
WWW	World Wide Web
XML	Extensible Markup Language

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Abstract

Information technology has changed the way organizations function. This has resulted in reliance of help desks to support users to deal with a wide range of information technology related problems such as hardware, software and telecommunication. The help desk generally has to cover a wide range of information technology products and services. However, due to resources problem, in particular the lack of help desk staff, users often have to wait for a considerably long time before their enquiries and problems are answered and solved. Literature has shown that the majority of incoming enquiries are considered to be simple and routine which do not require specialized knowledge. This research investigates the feasibility of developing a web-based user self-help knowledge management system by applying techniques in knowledge management and software agent technology to improve the support process of routine and simple technical enquiries in the help desk. In this research, simple and routine technical enquiries are classified as problems that can be solved by users if sufficient information is provided. A survey is conducted to identify queries and problems that are considered to be simple and routine. The results also show that a decrease of incoming enquiries can be expected if sufficient online information, trainings, guidelines and technical documentations are provided to the users. A conceptual knowledge management framework has been developed to create, store, make available, use and evaluate knowledge. A prototype has been developed to demonstrate the capability of providing solutions to simple and routine enquiries. Software agent technology and ontology are applied in the proposed system. Software agent provides autonomous handling of queries and ontology formalises vocabulary in the system.