FLOOD NOTIFICATION SYSTEM

MOHAMMED Z. D. SHBIER

UNIVERSITI UTARA MALAYSIA
2006

FLOOD NOTIFICATION SYSTEM

A dissertation submitted to the Faculty of Information Technology

in partial fulfilment of the requirement for the degree

Master of Science (Information Technology)

University Utara Malaysia

by

Mohammed Z. D. Shbier
October 2006

PUSAT PENGAJIAN SISWAZAH
(*Centre For Graduate Studies*)
Universiti Utara Malaysia

PERAKUAN KERJA KERTAS PROJEK
(Certificate of Project Paper)

Saya, yang bertandatangan, memperakukan bahawa
(I, the undersigned, certify that)

MOHAMMED Z. D. SHBIER

calon untuk Ijazah
(candidate for the degree of) **MSc. (Information Technology)**

telah mengemukakan kertas projek yang bertajuk
(has presented his/ her project paper of the following title)

FLOOD NOTIFICATION SYSTEM

seperti yang tercatat di muka surat tajuk dan kulit kertas projek
(as it appears on the title page and front cover of project paper)

bahawa kertas projek tersebut boleh diterima dari segi bentuk serta kandungan dan meliputi bidang ilmu dengan memuaskan.
(that the project paper acceptable in form and content, and that a satisfactory knowledge of the filed is covered by the project paper).

Nama Penyelia Utama
(Name of Main Supervisor): **PROF. DR. HJH. KU RUHANA KU MAHAMUD**

Tandatangan
(Signature) : 

Tarikh
(Date) : 30/10/06

PERMISSION TO USE

In presenting this dissertation in partial fullfillment of the requirement for a postgraduate degree from Universiti Utara Malaysia, I agree that the University Library may make it freely available for inspection. I further agree that permission for copying of this thesis in any manner, in whole or in part, for scholarly purposes may be granted by my supervisor or, in absence, by the Dean of the Faculty of Information Technology. It is understood that any copying or publication or use of this thesis or parts thereof for financial gain should not be allowed without my written permission. It is also understood that due recognition shall be given to me and to Universiti Utara Malaysia for any scholarly use which may be made of any material from my thesis.

Request for permission to copy or to make other use of materials in this thesis, in whole or in part, should be addressed to:

Dean of the Faculty of Information Technology

Universiti Utara Malaysia

06010 UUM Sintok

Kedah Darul Aman.

ABSTRACT

Floods occur in many countries every year and often cause great losses. How to monitor and notify flood management teams and people is the key problem for flood pre-disaster management. In Malaysia, flood disaster situation is still managed manually through multi-organization team according to standard operation procedure for disaster management. In current situation there is a delay in notifying those organizations that the situation is dangerous. The communication between those organizations is done manually, which generates a certain amount of risk in case of human error and of course its risky consequences. This study has developed a flood notification system that acts as a communication tool between disaster management organizations. The notification could be done through SMS and email.

ACKNOWLEDGEMENTS

In the name of Allah,

First, I would like to express my appreciation to Allah, the Most Merciful and, the most compassionate who has granted me the ability and willing to start and complete this study. I do pray to his greatness to inspire and enable me to continue the work for the benefits of humanity. My most profound thankfulness goes to my supervisor Prof. Dr. Ku Ruhana Ku Mahamud for her scientifically proven and creativity encouraging guidance. I wish specially to thank all my dearest family members, lecturers, friends especially Zakaria, for their patience and understanding during this challenging time.

Thank you UUM.

TABLE OF CONTENT

CHAPTER 3: METHODOLOGY

CHAPTER 4:FINDING AND DISCUSSION

LIST OF FIGURES

LIST OF APPENDIXES

LIST OF ABBREVIATIONS

Acronym	Meaning
FNS	Flood Notification System
DO	Distinct Officer
DID	Department of Irrigation and Drainage Malaysia
UUM	University Utara Malaysia
MSF	Microsoft Solutions Framework
ASP	Active Server Pages
EOC	Emergency operation center
AML	Data manipulation language
ANN	artificial neural network
CEOS	Committee of Earth Observation Satellites
RS	Remote Sensing
GIS	Geographical Information Systems
ICT	Information and Communication Technology
GIT	Geo-information Technologies

CHAPTER 1

INTRODUCTION

Natural disasters are the outcome of many complex geophysical characteristics as well as the related social situation that are subjected to hazard. These natural disasters may be split into groups: hydro-metcorological, geophysical and biological disasters. Typically, dealing with disasters assumes three distinct phases: pre-disaster planning i.e. early warring and mitigation strategy, during disaster activities (responses) and post disaster (includes relief, rescue and rehabilitation) (Matar, 2005). A disaster management strategy may be divided into two sequential phases, namely, pre-disaster management and post-disaster management. In this scenario prior to a disaster, management activities are pre-disaster planning, and disaster prediction. A good disaster prediction technique plays a crucial role in an efficient mitigation of disasters such as flood (Mandal et al. 2005).

In Malaysia, disaster situation is managed manually through a multi-organizational team according to the standard operation procedure for disaster management produce by the Prime Ministry Department called 'Arahan MKN 20'(Noor Suziane, 2004). This study attempts to solve the problem of integration between the two flood emergency concerned departments: Department of Irrigation and Drainage (DID) and the District Office (DO) is responsible for monitoring water level and informing DO when the water level is dangerous and DO is responsible for setting up the emergency operation center (EOC) and informing the public. There is no automated communication between these two departments.

The contents of the thesis is for internal user only

References

Aldea, A., Banares-Alcantara, R., Bocio, J., Gramajo, J., Isern, D., Kokossis, A., Jimenez, L., Moreno, A., and Riano, D. (2003). Onotology-Based Knowledge Management Plarform. IJCAI Workshop on Information Integration on the web, Acapulco, Mexico. Pp. 177-182.

Bach, H., Appel, F., Fellah, K. and de Fraipont, P. (2005). Application of flood monitoring from satellite for insurances. *Proceedings of the IEEE International Geoscience and Remote Sensing Symposium*, 1, pp. 25-29.

Bach, H., Lampart, G., Strasser, G. and Mauser, W. (1999). First results of an integrated flood forecast system based on remote sensing data. *Proceedings of the IEEE International Geoscience and Remote Sensing Symposium*, 2, pp. 864-866.

Lory G., Campbell, D., Robin A., Simmons, G. and Rytkonen, P. (2003). Microsoft Solutions Framework version 3.0 Overview.at http://www.microsoft.com/technet/itsolutions/msf/default.mspx

Huai-Zhi S. and Zhi-Ping, W. (2005). Intelligent early-warning system of dam safety. *Proceedings of 2005 International Conference Machine Learning and Cybernetics*, 3, pp. 1868-1877.

Hussain, M., Arsalan, M.H., Siddiqi, K., Naseem, B. and Rabab, U. (2005). Emerging geo-information technologies (GIT) for natural disaster management in Pakistan. *Proceedings of 2005 Recent Advances in Space Technologies*, pp. 487 - 493.

Lin, W., Qi-Ming, Q., Dong-Dong, W., Ghulam, A., Chun, Z., and Jun, Z. (2004). Decision support system of flood disaster for property insurance: theory and practice. *Proceedings of the IEEE International Geoscience and Remote Sensing Symposium*, 7, pp. 4693-4695.

Mandal, S., Saha, D., and Banerjee, T. (2005). A neural network based prediction model for flood in a disaster management system with sensor networks. *Proceedings of the IEEE International Intelligent Sensing and Information Processing*, pp. 78-82.

Matar, M.A. (2005). Space-based facilities for environmental disaster monitoring, assessment and management. *Proceedings of 2nd International Conference on Recent Advances in Space Technologies*, pp. 660-666.

McGuinness, E., (2006). BrightWork company. at: http://msdn.microsoft.com/vstudio/teamsystem/msf/

Noor Suziane, S. (2004). Agent-based reporting for flood emergency operation centre. Faculty of Information Technology, University Utara Malaysia.

Kasai, H., Yamazaki, K. and Kurakake, S., (2005). Space Adaptive notification system guaranteeing message reachability. Proceedings Proceedings. International Conference, pp. 208-217.

Reuber, C., Robben, C.D., Jr and Rubenstein, L. (1988). A public information and notification system for emergency mitigation. *Power Delivery, IEEE Transactions*, 3, Issue 4, pp. 1355-1362.

Wang, S., Chew, S., Zhou, Y. and Zhao, Q. (2004). Assessing the efforts of the flood diversion and storage in the drainage area of Huaihe River using remote sensing. *Proceedings of the IEEE International Geoscience and Remote Sensing Symposium*, 4, pp. 2276-2279.

Wood, H.M. (2001). The use of Earth observing satellites for hazard support. *IEEE 2001 International of Geoscience and Remote Sensing Symposium*, 1, pp. 135-137.