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論 文 要 旨

THESIS SUMMARY

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要旨（英文 800 語程度）
Thesis Summary（approx.800 English Words ）

Disaster Management through the Perspective of Information Systems
(情報システムの観点からの災害マネジメント)

Disaster management is considered to be a complex system with limited resources, limited time, and unexpected factors. This research focuses on natural disasters. The research goal of this dissertation is to study disaster management as a system, from the perspective of information systems. The study contains the following research objectives: (1) To understand disaster management systems through the perspective of enterprise engineering; (2) To examine the information needs of people during disasters; and (3) To provide academic and practical outcomes for disaster management. Throughout this dissertation, there are three main modules: Conceptualization, Specification, and Implementation.

The Conceptualization module focuses on important disaster management systems, including early-warning systems, response systems, and recovery and reconstruction systems. The enterprise engineering methodology called *DEMO* (*Design and Engineering Methodology for Organizations*) has been used in several real disaster cases, such as the 2011 Thailand Flood, the 2011 Great East Japan Earthquake and Tsunami, and the 2013 Super Typhoon Haiyan.

The Specification module focuses on examining the information needs. This module considers the cases of the 2011 Thailand Flood, the 2013 Jakarta Flood, and the 2013 Super Typhoon Haiyan. Aspects include information from technological channels, such as mobile applications, as well as traditional communication channels. Disaster information and warning systems are also discussed.

The Implementation module focuses on the analysis of building damage, using the case of the 2004 Indian Ocean Tsunami and the development of disaster mobile applications to calculate the estimated damage to the buildings from tsunamis. The prototype application can generate the estimated damage level and collapse probability, taking the case of Kesennuma City in Japan, based on the 2011 Great East Japan Tsunami data.

The results and findings of these three modules can contribute to both research and practice. The research provides abstract models of focused systems, together with many interesting issues, best practices, lessons learned, and problems. It also offers a framework of information needs in disasters. The practical outcomes are the statistical model to estimate the damage level of the buildings from tsunamis, and a prototype of a disaster mobile application.

Keywords: Disaster Management, Enterprise Engineering, Information Needs, Information Systems, Mobile Application, Natural Disasters