Chapter 29
Information System Model for Global Emergency–Response System in the Context of Natural Disaster Recovery Management System

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ABSTRACT

Emergency needs occur anywhere anytime by naturally, manually and accidentally in addition to worldwide death by hunger and poverty. As such, the need of response system should be there to tackle this emergency. Natural disasters are increasingly frequent in recent years taking people’s lives and destructions, for example, Hurricane Katrina US 2006 and Tsunami Asia 2004. This study proposes a model for Classification of Natural Disasters and Catastrophic Failures activity model. This model consists of hierarchical roles and activities. It is critical that organization must support and provide infrastructure for managing and preventing disasters and its aftermath to a full recovery. Furthermore, this chapter also proposes a triangular model for global emergency response systems, which can be used as a preventive measure, as well as post-recovery management system for managing and tackling emergencies. This model also proposes the use of emerging technologies such as ubiquitous computing and wireless communications systems. Now-a-days people use these wireless technologies to communicate in case of a disaster. Lastly, the study proposes another two models namely the Disaster Risks categorization model, which help identify and to assess the threat levels.

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INTRODUCTION

The term “disaster” has been defined by different scholars in different ways (Van et al. 2007) have identified a set of characteristics, in addition to the list identified by Hiatt (2000) for the definition of a disaster: Surprise, Insufficient information, Escalating flow of information, Loss of control, Intense scrutiny from outside, Siege mentality, Panic, Short-term focus, Physical injury, Loss of business operations, Loss of employee morale and motivation, Loss of team co-operation, Non-integrity of enterprise information and data control, Inefficient information technology systems, Inadequate security in place, Lack of safety procedures and training – has been used to define the term. However, if we analyse the different terminologies we can see that they refer to the same situation but in different ways. Global technology has been recently affecting different fields in our life as it has been effectively employed to many domains such as e-commerce, control systems, information gathering and management and other areas of similar interest. The natural disasters in USA and Asia in 1994, the 9/11 attack revealed that people lives and both technical and constructed infrastructure can be easily damaged. The increasing use of technology put more stress and uncertainties when disasters happen. According to a report by the secretariat of the International Strategy for Disaster Reduction (IFRCRCS, 2004), over than 478,100 people were killed, more than 2.5 billion people were affected and about $ 690 billion losses in economy caused by natural and man-made disasters. Disasters triggered by hydro-meteorological hazards amounted for 97% of the total people affected by disasters, and 60% of the total economic losses (Shaw 2006).

It is evident that each type of a disaster has a different impact and each country and government has a different way to deal with such incidents. Therefore, it is essential to design an appropriate policy and apply successful strategy that can minimize the threat of disasters. Developing a global emergency management information network that provides electronic access to emergency management knowledge would be crucial. However, the emergency management coordination processes did not act effectively and broke down in the wake of the aforementioned disasters (Shaw 2006).

Moreover, the most advanced information systems and technologies did even contribute to relief the affected populations. When hurricane Katrina and Tsunami happened, the affected people relied to basic web sites to search for their friends or families instead of using information resources provided by government and professional relief organizations. In the wake of Tsunami, software engineers had to create other alternatives that they had created voluntarily to build a basic emergency response system (Aljazeera, 2005). This disaster made researchers and practitioners in emergency management to reconsider the function of information system in case of an emergency response. The system design, development, use, and evaluation of emergency response information systems obviously needs to take a far more prominent place on the agenda of researchers, emergency managers and policy makers worldwide.

Existing information system models have enormous challenges that have been identified over many years. However, current studies on information system models for large-scale projects are limited. Therefore, the main aims of this research are to integrate information systems models with project management strategies:

- Identified specific management roles to tackle large scale natural disaster recover planning and prevention techniques
- Clear guidelines on information flow and person responsibilities as this can be very difficult in large organisations that are linked as in government departments.
- Clear identification of contingency planning guidelines, information flow, timing, and specific roles.
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