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# 농축산 전염병 위기완화서비스 체계구조 및 응용모델

정희창 \* 김동일 \*

\*동의대학교

The framework and application model for risk mitigation service based networks

heechang Chung\* · Dongil Kim\*

\* Dong-Eui University

E-mail : gyoonchung@naver.com.

## 요 약

농축산 전염병 위기완화서비스 모델구조 및 응용모델은 모바일, 인터넷 등 네트워크 기반에서 전염병과 같은 위기 발생 지점과 위기 영향 영역 사이에 위기완화 및 위기 통제 기능을 두어 위기완화를 대처해 나가는 체계 및 응용모델을 제시한다.

## ABSTRACT

The framework and application model for risk mitigation service based on network provides monitoring function of the risk event data to be inputted and analyses it for mitigation process. Furthermore, it performs the analysis of the manmade calamities such as accident, building destruction, natural calamities caused by climate change, and animal harms caused by bird flu and foot-and-mouth disease occurring in livestock and wild animals, and provides the mitigation service of it. The application model for risk mitigation is combined with network and carries out the real time acquisition and monitoring of risk events, and provides mitigation service for the risks caused by calamities and reduces economic losses.

## Keyword

mitigation service, manmade calamities, bird flu, foot-and-mouth disease

## I. Introduction

The as bird flu foot-and-mouth disease occurring in livestock, and even causes serious economic losses. The most like these cases appear with various aspects, wide regional distributions and high occurrences in the rural area. If such risks were mitigated by an application service with the recent ICT, economic losses and relevant harm related to and livestock could be much reduced.

In often cases, the risk situations could occur in remote mountainous areas of the complicated

lay of the land, the blind zones of mobile communication, or the blocked area of the main traffic routes. Thus, the framework and application model for risk mitigation service needs to be developed on resilience concepts, emergency communications, network preparedness and requirements for specialized systems and capabilities.

This document provides an overview of the risk mitigation service, and several key concepts that can be employed to enhance network resilience. The document then considers the application of these concepts

within the different systems that typically integrate to facilitate emergency communications between the public and emergency personnel.<sup>33</sup>

## II. Concept of application model for risk mitigation service

This service covers mitigation process reducing economic losses and risks to be caused by the bird flu and foot-and-mouth disease occurring in livestock. The results processed by Risk Mitigation Control Server (RMCS) are reported to Risk Control Center which is consists of hierarchical architecture with Local Risk Control Center and Higher Risk Control Center for actuating action according to types of risks.

Namely risk mitigation control action performed by RMCS directly is delivered to risk control center to achieve speedily risk mitigation application service. Thus, Network based risk mitigation control server only independently carry out risk mitigation application work. Risk control center take a prompt mitigation action for risk according to the command from RMCS. Thereby, architecture of the risk mitigation application service consists of the horizontal distributed processing structure as shown in the figure 1.

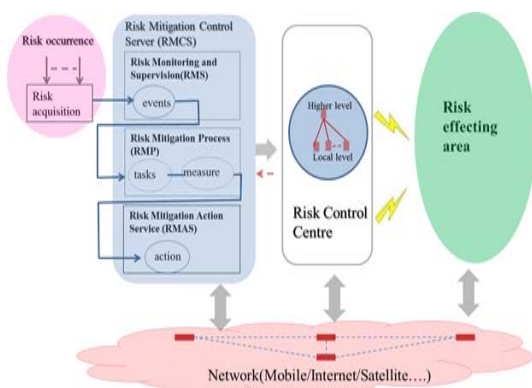


Figure 1. Conceptual model of risk mitigation service.

The ICT based risk mitigation control server consists of risk monitoring and supervision of event, risk mitigation process function, and risk mitigation control and publishing service, etc.

## III. Reference architecture of application model for risk mitigating service

The architecture of application model for risk mitigating service consists of risk monitoring server(RMoS), risk mitigation server(RMiS), risk management center(RMC), and ICT network. The network is to establish a multiple communication network interface for risk mitigating service so as to achieve the interconnection and interworking among different network provider of application platform.

It mainly consists of Internet network, and mobile communication network. Risk monitoring server has responsible for event monitoring, data sorting, and risk measuring and classification. Risk mitigation server has responsible for risk assessment, risk mitigation and reduction process, and risk preparedness and prevention. These servers perform monitoring and mitigation function based on basic supporting software and hardware operating environment.

This mainly consists of natural risks, livestock risks, and manmade risks as shown in the figure 2. Natural risks are like flood, drought, typhoon, snow, hailstorm, landslide, and earthquake, etc. Livestock risks are like FMD, HPAI, rinderpest, bovine, anthrax, and fowl typhoid, etc. Manmade risks are like building destruction, disintegration, and disruption, etc. The architecture adopts two servers which perform the monitoring and mitigation function to process rapidly tasks.

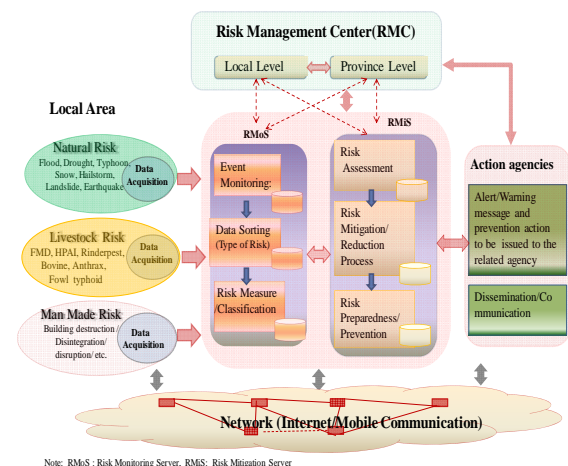


Figure 2. Reference architecture for the risk mitigation service model .

In mitigation management service, when actions related to risk mitigation come to the management center, the response working order of its center is delivered to the action agency, and to the working team to inspect and guide risk mitigation work on risk effecting site. The emergency working team can achieve the front and rear cooperation of the on-site risk mitigation command with coordinating mitigation management center.

#### IV. Conclusion

The framework and application model for risk mitigation service based on network are proposed that provide monitoring function of the risk event data to be inputted and analyses its big data to be stored in real time for mitigation process.

Furthermore, it performs the analysis of the plant disease risk such as downy mildew, phytophthora, phytophthora infestans, marine aquaculture risk such as a red tide, and livestock disease risk such a bird flu,

food-and-mouth disease, avian influenza, and rinderpest occurring in livestock, and provides the mitigation service of it.

The application model for risk mitigation is combined with network and carries out the real time acquisition and monitoring of risk events, and provides mitigation service for the risks and reduces economic losses.

#### [Reference]

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