Incorporation of GIS, Grid Computing and RFID into National Health Information Federation toward Seamless Infectious Disaster Management

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Abstract

The severe acute respiratory syndrome (SARS) outbreak of Southeast Asia in 2003 had brought a serious impact and even disaster to entire society, healthcare practitioners, healthcare institutions, and public works personnel worldwide. In order to better manage such disaster in the future, much attention was drawn on interoperability for a nationwide health information network. Inherent in the massive collection of data, trade-offs between quick response and accuracy that arises with mass surveillance systems is prospective. The application requirements for such a system include effective, coordinated response to disease and injury, accurate surveillance of area hospitals and efficient management of clinical and research information.

Nationwide health information network or federation can be extremely complex since it needs to integrate geographically distributed healthcare providers and other units with distinct functions and mutual dependencies. An enhanced health information network dealt with nature disaster caused by mass epidemic outbreak is discussed in this paper. Based upon the application requirements, we describe a health information federation that monitoring and detecting national infectious events based on GIS, RFID, and grid computing technology. This system is fault tolerant, highly secured, flexible, extensible, low entry effort and designed for large scale and quick response. Due to the federation nature, there is virtually no central server or data center need to be built.

This paper tries to reinforce the responsiveness of the national health information federation with a practical, tracking-based, spatial-aware, steady-to-use, and flexible architecture for developing successful infectious disaster management plan and implementing GIS and RFID to tackle technical issues. Proposed architecture will achieve a common

understanding of spatial data and processes, which will enable this system to efficiently and effectively share, compare, and federate yet integrate most of the local health information providers and results for more informed planning and better outcomes.

Keyword：