

Abstract

In order to prevent national disease and maintain national health, Center for Disease Control (CDC), Department of Health, Executive Yuan, operates the mission of national immunization during the last decades. Currently, the immunization records of each individual are centrally recorded in the database of National Immunization Information System (NIIS) located at each country's and city's bureau of health. CDC attempts to implement a centralized and integrated database for NIIS to more effectively promote and operate the tasks of national preventive immunization.

In this research, we present our implementing experience of building the integrated Central Database with its refresh mechanism for NIIS. In consideration from different perspectives, the objective of this study is to provide an integrated central database implementing and refreshing framework to integrate inoculation relative databases that are distributed over and located at each country's and city's bureau of health. The resulting benefits show that the system implementation of adopting a selective replication strategy for database design could have the advantages on both effectively enhancing system performance and reducing the computer storage cost. In additions, by using transaction logs with metadata mapping to build an automatic refresh mechanism could obtain better result of enhancing the benefit of data utilization and the efficiency of data retrieval. We also conduct the benchmark testing with Microsoft SQL Server. The result shows when the transaction data are small, the refresh efficiency of our mechanism is a little bit worse, however, when transaction data are larger than a certain amount, our mechanism is apparently better than Microsoft SQL Server, but two systems have no significant difference. After completing the implementation, the central database not only may provide the functions for promptly proceed to generate the statistical analysis for national immunization management, enhance the completion rate of immunization but also may provide the data resource to conduct the optimal planning of vaccine procurement, inventory management and distribution.

In additions, in this research we also conduct a questionnaire survey in order to understand the satisfactory to the nationwide users and system management after implementing the new NIIS. The results shows that the direction of the NIIS development with its architecture are commonly accepted. The result of this survey can be seen in the final report of this research.

Keywords : Immunization ; Database System ; Decision Support