A Framework of Data Integration, Knowledge Management and User Behaviour Modelling in Healthcare Applications of Diabetes

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Abstract
In last few decades, with the advent of database systems and networking technologies, a huge volume of health data and valuable medical knowledge have been electronically available, accessible and processible, especially over the virtual cyberspace – the Web, even from a remote corner in the world. Nowadays the wide deployment of Hospital Information Management Systems (HIMS) and Web based clinical or medical systems, for example, the Medical Director, a generic GP clinical system, have made it possible to record, disseminate and implement the health information and clinical practices easily and globally. And health care and medical service is becoming more data-intensive and evidence-based since electronic health records are used to track individuals’ and communities’ health information (particularly changes). Australia has a relative advanced health computing and networking infrastructure, including high rate of Internet connectivity throughout health service providers, electronic prescribing records, and many administrative data collection units and services at national or state levels. These highlights substantially motivate and advance the emergence and the progress of data-centric health data and knowledge management research and practice, for example, Health Informatics.

Type II diabetes is the fastest growing chronic disease and is the sixth cause of death in Australia. Certain regions, particularly western metropolitan Melbourne has an extremely high diabetes prevalence rate. Health research discovered that the prevalence and development of diabetes have a close relation to social determinant of population. Helping populations with, or at high risk of, diabetes to gain understanding of the disease, to make changes to their lifestyles, and to foster their confidence in accessing or contributing to services – in a manner that is inclusive, appropriate and flexible - is emerging as an urgent call from individuals and communities locally and nationally.

In this paper, we aim at addressing the above challenges and difficulties encountered in diabetes health service. We propose a framework of data integration, knowledge management and user behaviour modelling for complementing and improving existing health care and service systems for diabetes. In particular, a comprehensive Web-based and knowledge-driven information system will be established to work as an information and communication hub on diabetes, providing a consolidated research repository, a dynamic online and mobile community and a strong information management support of integrating and sharing information on diabetes. The schematic system structure and functional components of the framework will be presented and demonstrated in this paper respectively.

Keywords: Data Integration, Knowledge Management, User Behaviour Modelling, diabetes healthcare service.

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