

Pathway to the Development of Sustainable National Health Information System

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Today, in Thailand, there is a need for the “National Health Information System (NHIS)” that provides the transparent and secure access to health information across geographically distributed healthcare centres. To achieve this, several issues must be resolved altogether: (i) the diversity of health information structures among healthcare centres; (ii) the availability of health information sharing from healthcare centres; (iii) the efficient information access to at least 10,000 healthcare centres; (iv) the privacy and privilege of health information.

To implement this NHIS, we divide our work into 3 main phases starting from the healthcare centre to the information consumer perspectives. The 1st phase focuses on the application of metadata standard to enable the interoperability and usability of health information across healthcare centres.

Basically, two significant desktop tools are developed: Metadata Mapping Tool (MMT) and Metadata

Conversion Tool (MCT). MMT and MCT support healthcare centres to efficiently transform their

information stored in any relational databases into a standard format with a small effort. The 2nd phase

moves forwards to make information sharing possible and to provide an efficient information access to a large number of healthcare centres. This underlying work is thus based on Web Services, XML, Grid and P2P technologies. Essentially, MCT is wrapped up as a service, namely Metadata Service (MS), to accommodate the availability of an information sharing. As per a request, MS connects to a specified relational database and transforms the underlying information into a standard format. Beside MS, Metadata Broker (MB) as a service is developed in such a way that it not only provides the linkage to a potential set of MS' but also accesses and integrates their information based upon a request. To efficiently handle in-

formation access to a large number of healthcare centers, a number of MB' along with their communication are deployed and developed. Finally, in the 3rd phase, we plan to promote the privacy and privilege of health information with respect to roles of information consumers. To accomplish this, MB' and MS' are extended to handle the dynamic delegation of access rights, single sign on, trust relationship among multiple entities, data privacy and policy related security issues. This underlying work is thus based on the Public Key Infrastructure (PKI) and Privilege Management Infrastructure (PMI) standards. Particularly, Role Based Access Control (RBAC) is chosen to implement PKI. The secure health information exchange between entities at the message level relies on Web Services security standards.

Currently, we are at the end of the 1st phase. The field evaluation of MMT and MCT will be conducted soon at about 20 healthcare centres that have at least 3 different health information structures. In conclusion, our work has significantly driven the “sustainable” NHIS due to its intrinsic properties: transparency, data security, availability, extensibility and scalability.