Designing a Data Warehouse for Dementia Care Mapping (DCM™) for Monitoring and Improving Quality of Dementia Care

Researcher: Shehla Khalid
Supervisors: Dr Claire Surr & Professor Daniel Neagu
School of Health Studies, School of Engineering and Informatics - University of Bradford, UK

{s.khalid3, c.a.surr1, d.neagu}@bradford.ac.uk

Abstract

The aim of this on-going multidisciplinary study is to propose a design of a data warehouse that will store dementia related data for improving the quality of dementia care. The focus is on Dementia Care Mapping (DCM™) data; observational data that captures experiences of care from the perspective of people with dementia. A modified Grounded Theory (GT) approach is used for requirement analysis for the DCM™ data warehouse. This exploratory method has identified both technical (defining the data models) and social (acceptability and trustworthiness of DCM™ data from a data warehouse) requirements from the DCM users.

Background and introduction

Dementia is a serious global health challenge. With no cure to-date, improving the quality of life for people with dementia is a major aim internationally and a national priority in the UK (Department of Health, 2012).

Dementia Care Mapping (DCM™) (Brooker and Surr, 2010) is an observational tool which is used globally by health and social care practitioners and researchers to monitor and improve the quality of care and quality of life of people with dementia within formal care settings (hospitals, residential care homes, day care centres). DCM™ produces quantitative data as codes (letters and numbers) and qualitative data as text. This data is processed further following complex rules to give it meanings and understanding for various uses e.g. care planning, resource allocation, staff training etc.

Research (Sloane et al., 2007, Khalid et al., 2010) shows that if collected overtime and integrated, DCM™ data has potential for reuse for research, education, benchmarking and data mining for understanding the quality aspects of care provided to people with dementia. Hence improving their care. This requires DCM™ data to be collected over time from various organisations and individuals and warehoused in databases for further uses. Furthermore, such a database can also be used as data sharing platform across care provider and care quality monitoring organisations at global level. There has not been any national or international attempt to-date to design such a database by exploring the requirements for utilizing DCM™ data for above mentioned purposes.

Study aim

My doctoral study aims to design conceptual data models for DCM™ data warehouse informed by DCM™ users’ requirements. Requirement analysis is challenging given a complex nature of DCM™ data (combination of numbers, letters and textual data), its' contextual and rule based interpretation, lack of proper local data storage systems, missing organisational structure within which data is used and users from diverse backgrounds. This demands the use of appropriate methods for requirement analysis and data modelling (Khalid et al, 2010).

Methods

Requirements are identified from DCM™ users using semi-structured interviews, focus groups and existing documents on DCM™. A modified version of GT is used for requirement analysis. Further, the requirements are presented using multidimensional techniques of data modelling (star schema) within the data warehouse.

Preliminary results and future work

To-date interview findings from this novel study identify both social and technical requirements. Social requirements are forming a theory of data trustworthiness within the DCM warehouse; that contributes in modelling for provenance data. The technical requirements provide facts and dimensions; that contribute towards the multidimensional modelling of the data.

Future work involves interpreting the technical requirements into star schema and discussing social requirements with their implications on the development and implementation of the DCM data warehouse.

Implications

The findings of this study will contribute in producing the first prototype for a data warehouse containing dementia care related data at global level. The modified GT methodology provides a fresh perspective for identification of high level requirement for data warehouses when aim is to set the scope and identify the social perspective of data re-use using user-driven approach.

References


Department of Health. 2012. The Prime Minister’s Challenge on Dementia: Delivering Major Improvements in Dementia Care and Research by 2015: A Report on Progress
