

## **Introduction to Minitrack IT Architectures and Applications in Healthcare Environment**

Radmila Juric  
University of Westminster, UK  
[juricr@wmin.ac.uk](mailto:juricr@wmin.ac.uk)

Jasna Kuljis  
Brunel University, UK  
[Jasna.kuljis@brunel.ac.uk](mailto:Jasna.kuljis@brunel.ac.uk)

Patricia Oberndorf  
Carnegie Mellon, US  
[po@sei.cmu.edu](mailto:po@sei.cmu.edu)

We are pleased to introduce a very interesting group of papers, which demonstrate the pervasiveness of modern healthcare environments and the range of disciplines we must employ when addressing healthcare problems across different domains. All these papers promote either new technologies or software engineering techniques, which fit various frameworks and architectures, and thus show a range of IT applications in healthcare.

The paper entitled “A Balanced Scorecard Approach to Perioperative Management: A Case Study Perspective”, is a 90-month longitudinal study of a large 909 registered-bed teaching hospital, which investigates the impact of integrated information systems to identify business analytics used to improve preoperative efficiency and effectiveness of patient care, operational efficiency and cost-effectiveness.

A novel idea called ‘persuasive sensing’ which can predict blood glucose level, for the next day, with accuracy of 94%, through artificial neural network, has been proposed in the paper entitled “Persuasive and Pervasive Sensing: a New Frontier to monitor, Track and Assess Older Adults Suffering from Type-2 Diabetes”. Wireless sensor network in the home environment captures activities of daily living and data mining techniques secure daily feedback via SMS.

Another paper, entitled “Towards a Software Tool for Raising Awareness of Diabetic Foot in Diabetic Patients” also focuses on diabetic patients, but it highlights how an automated software tool may play an important role in preventing complications of developing diabetic foot. Their proposal is not a clinical decision support system: it creates a personalized environment which empowers patients, who are able to prevent the development of DF through a set of automating warnings and advice issued in various situations in patients’ lives.

The next paper “A Clinical Decision Support System for Adult ADHD Diagnostics Process” proposes an effective adult ADHD patient evaluation, diagnosis and treatment process, which is in use in Finland. Their solution also includes an extensive list of tools and tasks spread across multi-professional teams, which secure the synthesis of workflow management system and decision making.

The paper entitled “ChargeMed: Development of a Mobile Application for Medical Billing and Coding in the Ontario Healthcare Environment” focuses on the electronic billing management system and promotes its conceptual and technical architectures. It is interesting to note that they include contextual background in the mobile application, which opens the door to its functional evaluation and evolutionary modifications.

The next paper is in sharp contrast to the others because it samples Twitter accounts of 114 Australian health related organizations in order to study the characteristics of community wide health information dissemination via social media. Therefore “Twitter and Health in the Australian Context: What Type of Information are Health-related Organizations Tweeting?” is an interesting step towards understanding the disseminating of information for the development of software tools and applications, which will improve the coverage of health information sharing across communities.

The paper entitled “Use of Text Search to Effectively Identify Lifetime Prevalence of Suicide Attempts Among Veterans” demonstrates how the application of search engine technologies, with added text search, to a subset of electronic medical record system, improves the identification of individuals who have made prior suicide attempts. It may consequently prevent suicides for high risks individuals. The additional text search results in 80% precision for case identification in a sample of 10,000 patients.

A very interesting paper entitled “Transition Discovery of Sequential Behaviors in Email Application Usage Using Hidden Markov Models” shows how dynamically generated hidden Markov models characterize sequence patterns in user interface event streams. It can be used to model a usage of e-mail applications for users with cognitive impairments and therefore enables individual adjustments to the e-mailing environment to aid further learning.

Finally the paper “Using intelligent data sources to monitor unusual behaviors in individual's health data” proposes the design of a real time adaptive framework for accommodating the process of predicting, responding and monitoring unusual behavior in patient’s data stored in data warehouse environments.