

## Guest Editors' Introduction

### eHealth and Services Computing in Healthcare

Healthcare is often perceived to lag behind other industry sectors in its uptake and adoption of new technology. *eHealth* is one such technology which includes the areas of Health Informatics, Electronic Medical/Patient Records, Clinical Decision Support, Telehealth. The main purpose of *eHealth* is to provide better use of information in health care settings, to improve the quality of patient care and the efficiency of clinical processes. Many situations exist where the use of eCommerce principles would be appropriate to establish new *eHealth* solutions, and these warrant extensive research investigation. *Services Computing* has been described as a "cross-discipline that covers the science and technology of bridging the gap between Business Services and IT Services" (Site 1). This role is supported by Web services and service-oriented architecture (SOA), business consulting methodology and utilities, business process modelling, transformation and integration. The goal of *Services Computing* is to enable IT services and computing technology to perform business services more efficiently and effectively. Opportunities abound for the unique aspects of healthcare to drive fundamental computing and IT research together with leading applied research within the healthcare domain that could potentially be reapplied to areas outside of healthcare.

This special issue contains articles addressing *eHealth* and *Services Computing* in Healthcare from several different perspectives. The first three articles set the scene for research within this domain by focusing on business process modelling within healthcare and e-health, otherwise known as patient flow or patient journey modelling. While many healthcare organisations are utilising Lean Thinking (Site 2) based approaches, these research articles show that improvements can be made to these initiatives through approaches that better support the nuances of healthcare when compared to the retail and manufacturing sectors for example.

The first paper entitled "*An Evaluation Framework for Business Process Modelling Languages in Healthcare*" co-authored by Amir Afrasiabi Rad, Morad Benyoucef and Craig E. Kuziemsky sets the scene by introducing the healthcare domain, the business processes within it; healthcare's modeling requirements, and challenges of healthcare business process modeling. With this in mind they present the difficulties of modeling complex healthcare processes in a service based environment. They present a set of healthcare modeling requirements and propose an evaluation framework for process modeling languages based on these requirements. This is demonstrated through the evaluation of the suitability of two major process based service composition languages supporting services computing, namely BPEL and WS-CDL.

The second paper entitled "*Using Visual Analytics to Improve Hospital Scheduling and Patient Flow*" co-authored by Janna Anneke Fitzgerald and Ann Dadich presents an innovative approach to extend the lean thinking approach premised on visual analytics. They demonstrate that this approach can identify areas for improvement without having to make changes to the physical environment through a visual communication mechanism with staff.

The third paper entitled "*A process model to support automated measurement and detection of out-of-bounds events in a hospital laboratory process*" co-authored by Claire Costello and Owen Molloy considers an often overlooked area of business processes, that of process monitoring and measurement to support improvement. This is based on cycle time and utilization calculations utilizing Six Sigma measurement. The research is demonstrated within the context of these capabilities for health informatics through application to a Laboratory Testing process observed at a local hospital.

The fourth paper entitled "*Measuring end-users' opinions for establishing a user-centred electronic Health Record (EHR) system from the perspective of nurses*" co-authored by Yung-Yu Su, Khin Than Win, John Fulcher, and Heng-Chia Chiu provides foundation for the final three papers for this special issue through the assessment of end-user perceptions to EHR systems by a primary user, i.e. nurses. Factors influencing perceptions of System Quality, Service Quality, Safety Quality, User Use and User Satisfaction are presented.

The final three papers for this special issue advance research within the context of security, privacy, authorization control, and service discovery for EHR.

The fifth paper entitled "*A Medical Data Reliability Assessment Model*" co-authored by Bandar Alhaqbani, Audun Jøsang, and Colin Fidge introduces a Medical Data Reliability Assessment (MDRA) service model to assess the reliability of medical data. Their focus is to evaluate the trustworthiness of information sources.

The sixth paper "*Authorization Control in Collaborative Healthcare Systems*" co-authored by Daisy Daiqin He and Jian Yang considers one nuance in business process flow within the context of healthcare namely the highly dimensional collaboration model and provide an approach to access control for such an environment, taking collaboration semantics, together with individual participant's authorization policies into account.

The seventh and final paper for this special issue entitled “*A Method of Web Service Discovery based on Semantic Message Bipartite Matching for Remote Medical System*” co-authored by Yang Zhang, Bing-Yue Liu and Hong Wang aims to support remote medical systems through a service discovery method with semantic matchmaking.

The guest authors wish to express their deep gratitude to the reviewers of this special issue for their time and effort in providing detailed and timely reviews and also the support of the journal editor Dr. Narciso Cerpa.

## Websites List

Site 1: IEEE Computer Society Technical Committee on Services Computing  
<http://tab.computer.org/tcsc/>

Site 2: Lean Enterprise Institute  
<http://www.lean.org/>

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