Introduction to Minitrack on IT Architectures and Applications in Healthcare Environment

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This minitrack has again attracted a range of papers which illustrate interesting changes in the way we build applications and create architectures in modern healthcare systems.

“ESCAP: Towards the Design of AI Architecture for a Virtual Counselor to Tackle Students Exam Stress” by Dr Tarashankar Rudra, Dr Manning Li, Dr Manolya Kavakli from Macquarie University in Australia, gives us snapshot of various stages of their research in progress which models and designs an artificial intelligence architecture for a virtual exam stress counselor of a professional psychologist to support undergraduate students during their exam time.

“Using OWL Ontologies for Clinical Guidelines Based Comorbid Decision Support” by Samina Raza Abidi, Jafna Cox, S. Sibte Raza Abidi, Shepherd Michael from Dalhousie University in Canada illustrates OWL ontology-based clinical decision support framework, which is demonstrated through the example of handling chronic heart failure and atrial fibrillation. They use the power of OWL to model and exploit rather complex medical knowledge typical of Clinical Practice Guidelines.

“Secure and Reliable Distributed Health Records: Achieving Query Assurance Across Repositories of Encrypted Health Data” by Andrew Clarke, Robert Steele from University of Sidney, Australia, shows the application of query assurance across sources of searchable data for health systems architectures characterized by highly distributed and shared data repositories. Their approach has been tested against a large data set of continuity of care records.

“Pseudonymization with Metadata Encryption for Privacy-Preserving Searchable Documents” by Johannes Heurix, Michael Karlinger, Thomas Neubauer from Vienna University, JKU Linz and SBA Research in Austria addresses the leakage of data in modern healthcare applications and proposes a security protocol within the security architecture for data privacy that is strictly controlled by the owner. Consequently their methodology of integrating pseudonymization and access control provides privacy preserving queries.

“A Hybrid Web Based Personal Health Record System Shielded with Comprehensive Security“ by Jennifer Israelson, Ebru Cankaya from University of North Texas, presents the design and development of a hybrid, web-based scheme for creating, maintaining and sharing personal health records which becomes a framework for addressing the major security concerns such as confidentiality, integrity, availability, authentication and non-repudiation.

“Pattern Discovery of User Interface Sequencing by Rehabilitation Clients with Cognitive Impairments” by William Robinson, Ali Raza Syed, Arash Akhlaghi, Tianjie Deng from Georgia State University, is a continuation of their research, which was submitted to our minitrack in the last couple of years. This time they demonstrate the use of sequence pattern mining in monitoring the usage of e-mailing software by client with cognitive impairments. The outcome is a monitoring software which records and analyzes task sequences initiated by clients and finds repeated patterns in the user interface event streams.

“Evaluating and Improving the Preoperative Process: Benchmarking and Redesign of Preoperative Patient Evaluations” BY Jim Ryan, Barbara Doster, Sandra Daily, Carmen Lewis form University of Alabama and Troy University gives a study which highlights the impact of a continuous process improvement, benchmarking and re-engineering practices within a hospital’s preoperative process. In other words they claim that the given business process improvement and re-engineering are applicable to the hospital environment and their case study prescribes an a priory framework to foster their occurrence.

“An Examination of the Relationships Among IT Capability Intentions, IT Infrastructure Integration and Quality of Care: A Study in U.S. Hospitals” by Randy Bradley, Renee Pratt, Evelyn Thrasher, Terry Byrd, Carlos Thomas from Auburn, Washington & Lee, Southern and Western Kentucky Universities and The University of Tennessee, is a study of employing a multiple respondent research technique to assess the efficacy of a framework intended to improve the quality of healthcare in terms of hospitals’ abilities to detect and reduce clinical errors. They claim that IT infrastructure integration improved patient-centric responsiveness and reduction of errors.