

Introduction to the Minitrack: Data and Knowledge Management in Health Care

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The delivery of health care involves a myriad of stakeholders, including patients, direct health care providers, researchers, managed care organizations, and third-party payers. These stakeholders often have considerable differences in objectives, concerns, priorities and constraints, making data management in health care organizations a challenging endeavor. The Data and Knowledge Management in Health Care Minitrack focuses on the evolution of the database infrastructure required for handling clinical, managerial, and population-based data in the health care arena. The Minitrack has broadened in scope to cover issues in knowledge management that impact the delivery of care, health surveillance, and enhanced organizational capabilities for improving health. In addition, the adoption of electronic commerce models in health care is making data management technologies even more critical in support of both business-to-business and business-to-consumer relationships.

This year, we have accepted eight papers from among thirteen submissions dealing with a cross section of data and knowledge management topics. The first paper, "On Privacy Preserving Access to Distributed Heterogeneous Healthcare Information" by C. Boyens, R. Krishnan, and R. Padman, explores the security problems that arise when multiple sources of data are combined to infer sensitive information. The security implications of collecting and integrating health-related data are becoming increasingly important as the Health Insurance Portability and Accountability Act (HIPAA) and other emerging initiatives try to deal with privacy concerns. The authors propose an "audit and aggregate" strategy that delivers information in aggregate form that is both useful, yet minimizes the risk of unwanted disclosures.

The second paper, "Designing Guideline-Based Workflow-Enabled Electronic Health Records," by S. Barretto, J. Warren, and A. Goodchild, considers tighter integration between electronic health records and the systems that support the processes of care, such as clinical guidelines, decision support systems, and workflow management. These issues take on special significance in

the management of chronic diseases and the development of evidence-based care.

The third paper, "Using Information Systems to Structurally Map Workplace Injury," by D. Brown, and A. Kirk, utilizes contextual analysis to map the work processes, as well as accidents and injuries that threaten workers. These maps are then used to identify patterns or common paths in workplace incidents. Data from a real information system used by an Australian mining operation illustrates the approach.

The fourth paper, "Risk Grouping of Prostate Cancer Patients with Optimization," by L. Churilov, A. Bagirov, D. Schwartz, K. Smith, and M. Dally uses an interesting cluster analysis algorithm, based on an optimization technique, to group prostate cancer patients. The clusters are used to reveal patterns in patient outcomes and survival that might influence subsequent treatment options. Data from the William Buckland Radiotherapy Center in Australia is analyzed in the study. The "data-driven" technique highlighted some inconsistencies in the clinical literature-derived rules, with the possibility of refining the rules based on historical data.

The fifth paper, "Microarray Gene Expression Profile Data Mining Model for Clinical Cancer Research," by R. Xue, J. Li, and D. Streveler, proposes a database model for storing DNA microarray data for analytic and mining efforts. The model focuses on cancer-related data and implications for early detection, diagnosis, and treatment.

The sixth paper, "Spatial Simulation Model for Infectious Viral Diseases with Focus on SARS and the Common Flu" by C. Aschwanden, proposes a micro-level approach for simulating the spread of viral diseases.

The seventh paper, "An Indexing Standard for Sharing Health Education Multimedia Resources: The Health Education Assets Library (HEAL) Metadata Schema" by S. Dennis, C. Candler, S. Uijtdehaage, S. McIntyre, and S. Dippie, reports on a large-scale knowledge management effort to organize and deliver medical education material.

The last paper, "Context Thesaurus for the Extraction of Metadata from Medical Research Papers," by M. Shepherd, continues the focus on metadata, with the potential to organize and search medical literature.