

Introduction to the Minitrack: Data 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 planning, management, and delivery of health care services is now dependent on effective data management strategies, from both the business and clinical perspectives. As health care costs have once again started to rise steeply, efficiencies in administrative and clinical information processing offer one area of potential benefits. The Data 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 adoption of electronic commerce models in health care is making data management technologies even more critical. The ability to support both business-to-business and business-to-consumer efforts often rests on a foundation of database systems, along with evolving standards and networking infrastructures.

This year, we have accepted three papers from among seven submissions dealing with a cross section of data management topics. The first paper, "Examining Quality of Care – How Poor Information Flow can Impact on Hospital Workflow and Effect Patient Outcomes" by Reeva Lederman and Iain Morrison, casts a critical eye on hospital workflows and the use of information technology to improve the situation. The particular area of focus is in neurology and concerns the efficient delivery of patient images based on MRI (Medical Resonance Imaging), PET (Positron Emission Tomography), and other techniques. Clearly, delayed or missing information in such a context can affect the quality of patient care. The authors take a comprehensive approach, using patient surveys, staff

interviews, workflow analysis, and a simulation study to understand the issues in a field setting.

The second paper, "Business Intelligence in Healthcare Organizations," by Ton A.M. Spil, Robert A. Stegwee, and Christian J.A. Teitink, considers the importance of data warehousing and decision support technologies in health care organizations. The authors concentrate on both the promise of new technologies and the organizational issues required for successful applications. A business intelligence framework, based on several previous research streams, is discussed and four cases studies are used to illustrate many of the issues.

The third paper, "Interactive Visualization and Analysis for Gene Expression Data," by Chun Tang, Li Zhang, and Aidong Zhang, deals with an entirely different problem, highlighting the diverse applications for data management in health care. This work has a bioinformatics flavor, considering methods for the analysis and visualization of gene data from DNA microarrays. These DNA microarrays execute many simultaneous tests, representing the results as an image or 'bit map' based on individual cells in the array. A key challenge is to detect groups that "manifest similar expression patterns," while filtering out the noise. The authors develop a mathematical technique for mapping n -dimensional gene vectors into 2-dimensional points, allowing the results from DNA microarrays to be more easily visualized. The approach is illustrated on data drawn from studies on *multiple sclerosis* (MS).