Editorial Preface

A Call for Active Participation from IJHISI Readers:
Continuing to Build a Tradition for Healthcare Information Systems and Informatics (HISI) Research and Practices

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Following the appearance of the inaugural issue of the International Journal in Healthcare Information Systems & Informatics (IJHISI), numerous inquiries from potential and interested researchers as well as conference organizers have ensued about the possibility of having special issues with themes of healthcare information systems and informatics (HISI) research, in particular. Indeed, special issues in IJHISI themes are part of IJHISI’s longer-term mission, as long as any such proposal clearly supports the primary objective of the journal — to promote theoretical, empirical, and applied HISI research while promising to maintain a high quality peer-reviewed publication. As always, scholarly papers submitted to a regular and/or special IJHISI issue will be subjected to double blind editorial reviews and recommendations in addition to the approval of revisions from assigned co-editors and/or special issue editors as well as the editor-in-chief. Therefore, any special issue IJHISI proposal that is sent to me at an9188@wayne.edu will be duly acknowledged and swiftly considered.

In this second quarterly issue of IJHISI, we continue to provide readers with a wide selection of articles that are representative of the breadth and scope of the different HISI research domains and practices. The current editorial direction, therefore, is to build an understanding of the foundations, domains, and applications of IJHISI with an international focus and to achieve a strong global distribution network. Just as those of the earlier issue, the present set of contributed articles not only are intended to appeal to readers from various disciplines interested in HISI research and practices across the globe but are selected to showcase some of the emerging themes in order to build an HISI tradition. Several full-length empirical articles and theoretical reviews, including a book review, are presented in this issue.

“The M-Health Reference Model: An Organizing Framework for Conceptualizing Mobile Health Systems” adopts a grounded theoretical approach to breaking down and compartmentalizing the Mobile Health (M-Health) systems along the following five principal dimensions based on content analysis of the extant literature: communication infrastructure, application purpose, device type, data display, and application domain. Communication Infrastructure characterizes the mobile telecommunication technologies and networks. Application Purpose identifies the goals and objectives for the M-Health system to be applied, such as e-prescription, clinical data exchange, decision support, or other purposes. Device Type relates to the type of device being used, such as tablet PCs, personal data assistants (PDAs), sensors, and others. Data Display describes how the data will be presented and transmitted to the user; for example, through a series of images, e-mails, and/or textual data. Application Domain categorizes the domain of mobile technology application and defines the specific area that the M-Health system will be implementing, such as rural community health, wireless home healthcare, or some
other domain. All together, the M-Health Reference Model serves as a guide to healthcare stakeholders and m-health system implementers in order to identify the technological infrastructure and to understand the business requirements and operational needs of the M-health systems. In the latter part of the article, the authors concentrate on the security model of a proposed m-health system implementation and incorporate a case that illustrates how the M-Health reference model can be used to encapsulate a better understanding of the Blood Donor Recruitment (BDR) system components, especially on issues related to security of blood donor data capture and transfer.

The author of the next article, "The Internet, Health Information, and Managing Health: An Examination of Boomers and Seniors," provides valuable insights into an emerging and important HISI topic; that is, trends of Internet use for e-health information retrieval among the elderly vs. the baby boomers. Accordingly, the author notes, "For baby boomers, the Internet has become a major source of health information, second only to their family doctor." Whereas seniors probably have the greatest need for health information, the author claims that they do not use the Internet as their primary source of information nearly as extensively as the baby boomers. Briefly, empirical data compiled by the Kaiser Family Foundation on e-Health and the Elderly, a public opinion dataset of access by boomers and seniors to online health information, were analyzed by the author to show that boomers marginally use online health information more than seniors for the management of their health and that those who are more aware and have positive feelings toward online health information (for both boomers and seniors) would use the Internet more to manage their health. More simply, if people feel more at ease with and have a better attitude toward using the Internet for e-health information retrieval, they more likely will use it to manage their personal health or to do so on someone else’s behalf. This partly answers a very important research question that has been asked in many past e-health conferences: “Has online health information actually helped some people to manage their health more effectively?”

The subject of the third article, "User Acceptance of Computerized Physician Order Entry: An Empirical Investigation," reflects on the potential of computerized physician order entry (CPOE) systems to reduce healthcare costs, decrease medical errors, and improve the quality of healthcare delivery. As the authors point out in summarizing their results, the success of CPOE depends significantly on the acceptance of physician users and their subsequent use of these systems. Based on a series of hypotheses generated by the Technology Acceptance Model (TAM), the authors attempt to evaluate physician user acceptance of CPOE in a large general hospital setting in China. Items in the questionnaire are adapted from previous research and designed to measure perceptions of physicians about CPOE. Achieving a 51.5% response rate with a total of 103 questionnaires collected from 200 physicians, the authors conclude that analysis of the empirical data supported most of the predicted relationships. A secondary analysis further reveals that the effect of perceived ease of use on attitude toward using CPOE is moderated by CPOE experience; that is, perceived ease-of-use has no relationship with attitude for users with high CPOE experience, whereas it is positively related to attitude with users of low CPOE experience. In other words, as physician users become more experienced with CPOE, the issue of usability becomes less important. Yet, this result does not diminish the importance of the need for designers to pay attention to the usability factor.

In the fourth article, "Data Mining Medical Information: Should Artificial Neural Networks Be Used to Analyse Trauma Audit Data?" the authors formally evaluate an innovative methodological approach to mining medical data by comparing its results to the use of a traditional logistic regression method. Essentially, the Trauma Audit and Research Network (TARN) is a network designed to provide effective feedback and accurate classification of care for injured patients. The innovative approach used entails a layered system of key inputs, the weighing of factors for classification probability calculations, and an adjusted outcome neural network analysis. In other words, Artificial Neural Network (ANN) modeling begins with the system recording injury details such as demographics, the mechanism of the injury, various measures of the severity of the injury, initial management and
subsequent management interventions, and the probable outcome of the treatment in order to accurately discriminate between those patients who are expected to live vs. those who are predicted to die. Accordingly, the authors note, “Traditional logistic regression analysis of ten years worth of TARN data from one hospital are compared with the results when modeled as an ANN with the output set to be the probability that a patient will die.” Results show that both methodological approaches achieve roughly the same predictive accuracy, although ANNs are found to be more complex to interpret than the logistic regression model. Neither of the two approaches, however, was superior in predicting death. Thus, the authors argue that ANNs may not be seen as appropriate tools to analyze TARN data, although their findings further suggest the usefulness of applying both traditional and non-traditional analysis techniques together, as well as including as many factors in the analysis as possible.

The fifth article in this issue is “Nonparametric Decision Support Systems in Medical Diagnosis: Modeling Pulmonary Embolism.” Interestingly, the authors of this article, like those of the previous article just discussed, also are determined and interested in studying the efficacy of using neural network (NN) models for medical data analysis and data mining. More specifically, the research question asked here is how well do advanced decision-making tools such as nonparametric NNs improve the diagnostic capabilities in order to predict the likelihood of a pulmonary embolism (PE) in surgical patient population? Amidst a multitude of diseases, trauma, and related medical problems that patients are faced with today, PE, which may have mortality rates as high as 10%, is one of the most difficult and most costly to diagnose. This argues for the need of applying intelligent tools in order to identify patients at risk for PE. According to the authors, their analyses reveal that using NN diagnostic models (in particular, the backpropagation train NN) “enables the leveraging of knowledge gained from standard clinical laboratory tests, the d-dimer assay and reactive glucose, significantly improving its overall positive predictive value compared to using either test in isolation.” In other words, superior positive prediction can be achieved when the D-dimer result value is used in combination with the Glu-R result value owing to the additive nature of the NN modeling method, and not when each of these result values is used independently.

Finally, the issue ends with a book review that is aimed at helping the readers to think more critically about the organization and relationships among topics of a current health information systems and informatics text. Overall, it is the coordinated effort as well as the hard work of the contributors, reviewers, co-editors and publisher that makes it possible for IJHISI to be the vehicle of choice for disseminating high-quality and rich HISI content. Once again, not only am I confident that the quality of articles and the richness of content appearing in IJHISI will continue to disseminate among HISI research and practitioner communities, but I also believe that these articles will spur excitement and spawn interest among readers who soon may become contributors, as well. I am open to and will be most happy to entertain any new ideas, suggestions, or comments from the readers. IJHISI belongs to the readers and will evolve accordingly over the years through the active participation, contribution, review, and feedback provided by its readers.

Joseph Tan holds a professional diploma in civil engineering from Singapore Polytechnic, an undergraduate degree in mathematics and computer science from Wartburg College, IA, a master’s degree in industrial & management engineering from the University of Iowa, and a PhD in management information systems from the University of British Columbia (UBC). He has been a tenured associate professor, teaching in the Department of HealthCare & Epidemiology, UBC, for many years prior to serving as a professor and head of the Information System and Manufacturing (ISM) Department, School of Business, Wayne State University. Professor Tan publishes widely in numerous computing, ergonomics, information systems, health education, e-health, and e-business journals and has served as a guest editor and member of various journal editorial boards. He sits on
key organizing committees for local, national, and international meetings and conferences. Professor Tan’s research, which has enjoyed significant support in the last several years from local, national, and international funding agencies and other sources, has also been widely cited and applied across a number of major disciplines, including healthcare informatics and clinical decision support, human processing of graphical representations, ergonomics, telehealth, mobile health, and e-health promotion programming.