Guest Editorial Preface

Health Digital Transformation I:
E-Technologies and Intelligent Health IT/IS Adaptations to Increasingly Complex Problems in Today's Healthcare Services Delivery Systems

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With mounting interest in using innovative e-technologies to help resolve increasingly complex challenges in the healthcare sector, a multitude of perspectives have emerged, which can transform the landscape of today's health IT/IS solutions. These solutions cater not only to unite major stakeholders, such as third-party payers and policymakers, with care provider organizations to improve care management and financing, but also to assist care practitioners, as well as patients and their respective family members, in their shared decision-making roles towards achieving better healthcare.

This first of two special issues of IJHISI presents finalized versions of a series of well-positioned, peer-reviewed papers presented at HICSS-50 conference in January 2017 held on Hawai'i Island. These series of papers have originally been contributed to the Health Care (HC): Information Technology in Health Care Track via the various mini-tracks, and then further solicited through mutual agreement between potential contributors and Special Issue (SI) Editors (Bill Chismar, Tom Horan and Joseph Tan) on a "fast-track" release opportunity (http://hicssconference.wixsite.com/hicss/hicss-50-fast-track-opportunities). In this sense, aside from having passed through the notably high quality HICSS conference peer-review and acceptance process for the HICSS-50 presentation, these papers were again selectively guided through an additional "fast-track" review process for IJHISI publication considerations. For this "fast-track" review process, the papers are further cross-examined by invited peer reviewers assigned by anyone of the SI editors in collaboration with IJHISI editor-in-chief (Joseph Tan). Invited authors are requested to address any and all concerns resulting from a second round reviews before their papers can be included in one of the two Special Issues. Altogether, it is hoped that the finalized versions of these released papers, that have been doubly peer-reviewed and found acceptable for release for IJHISI readers, will significantly impact and influence the future work of the general Health IT/IS research communities.

The first issue of these papers survey the multiple perspectives arising from the pursuit of health IT/IS solutions by different stakeholder groups in resolving diverse healthcare challenges across a variety of programs and systems, including online self-care management programs (Wilson & Shaw, 2017), patient portal systems (Samhan, 2017), hospital-wide performance tracking systems (Ryan et al., 2017), community public health systems (Moreno & Osailan, 2017) and national insurance systems (Tan & Wang, 2017). Topics covered by these papers range from the use of Geographical Information Systems (GIS) tools for planning and designing community health programs, to the development of balanced scorecard (BSC) metrics as key performance indicators (KPIs) for improving the quality of care and cost-effectiveness management; from the deployment of emerging hybrid mining (HM) techniques for framing decisions, to the support of insurance claims review processing; from understanding patient perspectives in online engagements for self-care in pain management, to rationalizing the resistance to change behaviors in accessing patient portals.

"*Assessing Utilization and Effectiveness in Public Participative and Volunteered Geographic Information Systems for Environmental Data,*" the first of five articles included here, is a contribution by April Moreno & Sarah Osailan. The authors advocate having various volunteer-stakeholder groups be technologically assisted in their planning to transform contaminated public spaces (Brownfields) into healthy living areas (Healthfields). In essence, the idea of the B2H (Brownfields to Healthfields) program, an Environmental Protection Agency (EPA) program, is to gradually transform soiled public areas into park spaces and new hospital facilities so as to promote community public health. Specifically, the authors suggest GIS deployment as a mapping and planning tool to promote community health at different levels, including policymaking, organizational services and at the public support level. As no portal currently exists for local volunteering organizations to retrieve a map of "brownfields data to meet the required criteria of the organization in seeking a space for transformation to a healthfield or other public services facility," the implementation of a GIS-supported website appears to fill such a needed gap. As well, given the isolated nature of how existing community and demographic data are being sourced and stored, the authors argue that it is necessary to combine the data into a web application, making it available and accessible to all stakeholders so that such collaborating efforts can be passionately fruitful and also be goal-directed in the planning and designing of community-based, healthy living programs.

The next paper, "*Using Key Performance Indicators to Reduce Perceived Perioperative Complexity and Improve Patient Workflow,*" presents a critical work in the design and application of balanced scorecard (BSC) metrics as key performance indicators (KPIs) to enable business process management throughout the entire spectrum of the perioperative process within a large hospital setting. Methodologically, Ryan, J. and colleagues employed the use of a case approach to observe over a 157-month period how various performance of a 1,157 registered-bed teaching hospital is being tracked digitally. With this longitudinal view, they are able to help researchers and practitioners gain insights into how an integrated health IT/IS system may be leveraged into easing the perceived complexity of the perioperative process and to improve overall patient workflow. Conducting a stage-by-stage examination of the perioperative process on purpose also enable these authors to target specific improvement opportunities while gauging performance over time. Notably, they find that key contributing factors toward perioperative improvement included: (a) a clear knowledge of current limitations; (b) an ongoing recognition of potential capabilities; and (c) an intelligent understanding of the subsequent context. Put together, this contribution was able to identify "how dynamic technological activities of analysis, evaluation, and synthesis applied to internal and external organizational data can highlight complex relationships within integrated hospital processes to address root causes rather than symptoms and ultimately yield improved capabilities."

Following the hospital-based study, "*Non-Traditional Data Mining Applications in Taiwan National Health Insurance (NHI) Databases: A Hybrid Mining (HM) Case for the Framing of NHI Decisions,*" extends the scope of investigation into time-sensitive insurance claims review processing via the applications of new data mining methods, specifically, hybrid mining (HM) on a nationwide health insurance system, the National Health Insurance (NHI) databases in Taiwan. As Tan & Wang note, the HM approach is "a novel design for uncovering knowledge embedded in complex data systems linking multiple stakeholders," and that complex system is exemplified by the National Health Insurance Administration (NHIA) system in the case of their contribution. Just as with other contributors, the authors here also choose to employ a case approach to illustrate how HM can be cleverly deployed to frame policy decisions and provide the needed decision support to aid abuse and fraud detection in insurance claims processing. Accordingly, they argue that results of past research vis-à-vis their own investigations revealed that not only is the "HM approach a reliable, powerful, and user-friendly platform for diversified payment decision support, but that it also has great relevance for the practice and acceptance of evidence-based medicine." Finally, the authors advocate the use of HM approach not only as a critical tool to framing health insurance policy decisions, but they also

encourage future researchers to improve upon the existing approach by combining current knowledge in this area with their own application systems development.

"*Participant Perspectives on Benefits and Challenges of Engaging in an Online Pain Self-Management Program,*" the fourth paper, is a contribution by Marian Wilson and Michele Shaw. In this work, the two researchers explore qualitatively the perspectives of adult participants who have volunteered to be engaged in an interactive, online pain management program over a period of eight (8) weeks. Methodologically, these researchers extracted empirical data from secure online surveys being distributed for a previously published randomized controlled trial (RCT), specifically for 47 adults who had been prescribed opioid medicines for chronic pain. In line with their primary methodological approach, these authors relied on the use of content analysis methods to derive common themes across participating perspectives. "Positive reframing, improved accountability, and feeling supported" are three themes the authors found on the benefits side of the program while "ease of use" and the "desire for personalizing" are two themes they uncovered on how participants perceived the program experience can be improved. As these researchers note, drawing insights from participants is important because such insights can aid both program developers and caregivers in appreciating how the self-management of chronic diseases may be ultimately improved in online programming across a variety of health problems.

Lastly, "*Why do People Resist Patient Portal Systems? An Application of the Dual Factor Model of IT Usage,*" is contributed by Bahae Samhan. He argues for the potential benefits to both patients and their caregivers in the acceptance and use of patient portal systems (PPS). Yet, according to the author, "evidence shows that PPS are being resisted by patients" with few studies addressing this phenomenon. To advance this research, the author employed the survey technique to evaluate specific hypotheses derived from an integrative model, which he termed as "the dual factor model of IT usage" that combines the user resistance model (URM) with the universal theory of acceptance and use of technology (UTAUT). The empirical data are based on 265 responses collected from patients treated at a large international hospital with structural equation modeling (SEM) used to analyze the resulting dataset. More generally, the work represents a piece of timely contribution to our theoretical and empirical understanding on inhibiting factors towards the user intention to use the PPS. Accordingly, the author argues the importance of "integrating resistance to change with the technology use research especially in healthcare settings."

Altogether, the variety of increasingly complex challenges in healthcare services delivery systems being considered across all these contributions brings us to realize how rapidly the health digital transformation phenomenon has occurred during this era of big data, knowledge explosion and increased human-machine connectivity. As more and more healthcare data can and will be captured automatically and ubiquitously, we will be expected to make better sense of what is really going on and how best to improve community health and public well being, to heighten care quality and patient-provider relations, as well as to eliminate wastes, abuses and frauds. Applying e-health technologies and health IT/IS solutions appropriately will require us also to move towards a greater appreciation of machine-human learning integration so as to produce more precise and personalized health knowledge and intelligence for the greater good and advancement of individuals, groups, organizations and societies.

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