President’s column: operational informatics—expanding the scope of our discipline

In 2012, the AMIA Board of Directors issued a white paper which defined biomedical informatics1 and noted that ‘...identifying new competency areas on an ongoing basis is especially important for a field that is rapidly changing in both its informatics and its biomedical and health aspects.’ With the advent of the new medical board certification in Clinical Informatics and our efforts to develop the Advanced Interprofessional Informatics Certification (AIIC) process for non-physicians, further refinement of our focus as a discipline seems warranted.

The more global, all-inclusive definition is that biomedical informatics is ‘...the interdisciplinary field that studies and pursues the effective uses of biomedical data, information, and knowledge for scientific inquiry, problem solving, and decision making, driven by efforts to improve human health.'

There are a number of more refined areas of focus under the umbrella of biomedical informatics: (1) health informatics, which includes clinical, medical, nursing, dental, and public health or population informatics; (2) translational bioinformatics and clinical research informatics; and (3) structural (imaging) informatics.

Charles Friedman, PhD in a recent article in the journal stated that informatics represents a field that is ‘cross-trained with knowledge in the basic sciences and within a particular practice domain.’ He noted that the knowledge held by professionals in the field is derived from—but not limited to—‘information science, computer science, cognitive science and organization science’ (emphasis added). I emphasize the ‘organization science’ aspect because I believe that as an area of focus within the informatics sciences, it has—from my perspective—been inadequately addressed by the field in recent years.

For most informaticians, the field of biomedical informatics ranges from basic research to applied research and practice. While the various definitions capture many elements of the informatics field, it seems to me that we are missing a very important component where informatics can make a huge contribution to healthcare through what I refer to as ‘operational informatics.’ At the risk of increasing the ‘adjective problem’ defined by William Hersh, MD as the addition of ‘words that precede the term informatics,’ I offer this concept not to split hairs but rather to expand the field and its potential contribution to improving health and healthcare.

I believe it is important for those of us who are engaged in this dynamic and evolving field to be clear how we can more fully contribute to the ongoing debate on the future of healthcare. As I have stated on numerous occasions over the last several years, informaticians are the professionals in the best position to help society transform healthcare. To facilitate what I hope will be a new and evolving conversation among those of us in this field, I offer the following definition of operational informatics for consideration: ‘the use of informatics tools and methodologies that integrate both health and non-health related information for the purpose of improving outcomes, increasing quality, and reducing costs by enhancing efficiency, productivity, and the management of resources across all care delivery settings.’

Much of the focus in the field of informatics in recent years has been on the more health associated or clinically related elements of the specialty. The aforementioned AMIA white paper articulates a model of biomedical informatics that includes a number of component sciences, including: (1) information and communication sciences, (2) computer science, (3) engineering, (4) biological and physical sciences, (5) mathematical, statistical, and decision sciences, and (6) cognitive and social sciences/humanities. From my perspective, however, the very important element of ‘management sciences’ is missing. As a physician who was trained in clinical care but moved into managerial roles over time, I have become acutely aware of the importance of understanding the management sciences in order to serve as an effective leader within the healthcare community. As informatics expands from primarily a research and operational support activity into a mission-critical component of the C-suite’s management arsenal, it will become increasingly crucial to have informaticians who are well versed in the science and management of operational informatics as partners in healthcare organizations involved in care delivery and optimization.

The addition of management sciences as a component of the informatics field will be especially important as we continue our efforts to define the ‘productivity paradox’ outlined by Spencer Jones and his colleagues in the 2012 New England Journal of Medicine article, ‘Unraveling the IT productive paradox—lessons for health care.’ Jones noted that information technology (IT) productivity is difficult to measure due to the fact that ‘the performance measures used to assess the costs and quality of health care are drawn from administrative data that lack key details needed to detect the effects of health IT.’ It seems to me that while health related or clinically focused informatics issues are very important, it is also critical for informaticians to address the delivery elements of care which are not clinical but have a profound impact on outcomes: quality, cost, and service.

Let me offer an example to clarify my view of what operational informatics represents. The Veterans Health Administration (VHA) within the Department of Veterans Affairs (VA) recently made the decision to invest nearly $500 million in deploying a state-of-the-art real time location system (RTLS), which uses radio frequency identification (RFID) devices deployed on equipment and supplies throughout the hospital in addition to the tagging of the healthcare professionals working in the institution. In deploying the system, the VA will greatly enhance their ability to more effectively and efficiently transport patients from the emergency room to the intensive care unit, find and deploy ventilators and IV poles,
and manage supplies on the floor, among a host of other applications. As a result, VA hospitals will be able to better manage hard assets. However, the value is not only in tracking hard assets but also in managing personnel—the most expensive component of the overall healthcare dollar expenditure—and their interaction with those physical assets. Through the application of analytics to the use of hard and people assets, the new system is projected to create major savings across the 130+ hospital VA system.

In a pilot of the RTLS system at Texas Health Resources, the VA was able to realize savings of over $82 000 per month in reduced rentals, reduced shrinkage, and increased utilization for a 200+ bed hospital. Extrapolating these results yields annual savings of just under $1 million for an individual hospital of a similar size and service capability. Imagine the savings across an entire VHA system? The dollars mount up quickly. But the most important point is that without informatics or analysis of the data to create ‘information’ and ‘knowledge,’ the system only offers incremental value. Through the application of operational informatics, the new system will create important differential value by helping managers understand how to more effectively and efficiently use critical resources within the hospital setting. As a straight-up return on investment, the return in hard dollar savings will likely occur over a period of 3 years. If the soft dollar savings are also included in the return on investment calculation, the return will no doubt be accelerated. The issues that will arise through the analysis of large data sets of tracking information on hard assets and people resources will be resolved through the application of operational informatics.

The healthcare informaticians of the world will not resolve all of the questions facing healthcare. However, with rigorous application of our methodology and science to both the clinical as well as the more operational aspects of healthcare, we can contribute substantially toward truly transforming healthcare.

In light of our nation’s massive investment in health IT infrastructure, the time has come for the informatics profession to step up to the plate and help increase the value of these deployed systems. I firmly believe the clinical value of the systems will be realized, but we should not neglect the more operational side. In fact, given the inefficiencies of most healthcare organizations, I am willing to argue that the value we create using operational informatics is likely to be at least equivalent to or perhaps even exceed the value we derive from health or clinical informatics. I’m willing to be proven wrong. I look forward to the debate and the refinement of our models and approaches toward operational informatics.

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Competing interests None.

Provenance and peer review Not commissioned; not internally peer reviewed.

To cite Fickenscher K. J Am Med Inform Assoc 2013;20:1007–1008.
J Am Med Inform Assoc 2013;20:1007–1008. doi:10.1136/amiajnl-2013-002170

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