

Interoperable Healthcare: Ideas and Directions

A “National Summit” meeting, titled “Moving Toward Interoperability: Technologies for Accessible, Affordable Healthcare” took place at the National Institute of Standards and Technology (NIST) campus in Gaithersburg, Maryland October 18-19, 2006

Attendees enjoyed a mixture of policy statements and opinions from highly ranked Federal and industry personnel as well as technical poster sessions that presented a wide variety of interesting approaches to meet the Federal Mandate of interoperable health care. This report summarizes the main focus areas of the conference as well as a recap of the keynote addresses and a selection from the technical research community.

Keynote Addresses

Michael O. Leavitt, the Secretary of Health and Human Services, pointed out that “the world is starting to intuitively organize itself into networks.” He predicts the rapid advent of community healthcare networks due to grassroots cultural change (a safe prediction, in my view), and points out that standards produce innovation which in turn enable effective networking. Effective networking is the “frontier of productivity” as it enables effective collaboration. He terms collaboration the “sociology of networks” – an interesting perspective.

Craig R. Barrett, Chairman of the Board, Intel Corporation, points out that the U.S. has overspent on Health Care and Education with poor results in both cases. He suggests the consumer has very little steering power over the current health care state of affairs. His mantra is “we all must change” as complete interoperability is needed to manage the personal HR. He suggests coupling the purchasing power of industry with the purchasing power of the federal government to drive interoperability, producing a Personal Health Information Card analogous to the ubiquitous Personal ATM (bank) Card.

Dr. Mike Magee, Director, Pfizer Medical Humanities Initiative and Host of the “Health Politics” webcast opines that to transform healthcare, enthusiasm (excitement) and resonance is needed – technology reform as a grassroots effort. He stresses that the resources to transform are available; what is missing are the planning and the leadership. As he puts it, technology needs to modernize and humanize. He predicts the merge (collapsing) of three disparate databases in the short-term future: a) clinical research, b) continuing medical education (CME), and c) continuing consumer education. Dr. Magee discusses the phrase “Health Politics” and points out that Politics can be taken as top-down and elitist, but in his sense, he is talking about politics as bottom-up and idealist. He couples health, a basic human right, with the populist sense of politics and proposes the appealing notion that society is better off with a relationship-based HC system.

Focus on Care for the Aging

The Center for Aging Services Technologies (www.agingtech.org) convenes I.T. companies in concert with HC Delivery Companies. As both Barrett and Eric Dishman, the General Manager & Global Director, Intel Health Research & Innovation Group, state, CAST envisions the home as being the center of care for the aged. They presented a glossy, well produced “concept” video, with actor Jeff Bridges doing the introduction, of a “near future” scenario. The video shows a day-in-the-life snapshot of “Ernesto”, an 87 year old man with chronic health complications, who lives for the most part alone in a wired house with a virtual connection via audio/video links with his children who live one hundred miles away and his doctor. His children are connected as well to an healthcare intermediary who can answer questions they might have about changes in his medications, and so on. The focus is on improving healthcare through improved relationship management between all the concerned parties, and, generally speaking, moving from an interventionist crisis management approach to a proactive health and wellness approach. This point was reiterated by Jose C. Lacal, Senior Manager, Seamless Health Center of Excellence, Motorola, Inc.

Interestingly, the vision of home-centered care came up immediately after the conference in a Monday, October 23, 2006 article that appeared in the Wall Street Journal – “Seniors in Vermont are Finding They Can Go Home Again” by Lucette Lagnado. In this “unusual Vermont experiment”, government money is being shifted from nursing homes to private homes in concordance with the CAST video vision. It is a good sign for the vitality of the underlying material when a conference presentation is so topical it makes the headlines shortly after it concludes.

Focus on Standards

Tom Rhodes had a poster on the HealthCare Standards Landscape (HCSL) project, from the NIST Information Technology Laboratory (ITL). HCSL is a dynamic, web-based, repository of Health Care standards information. Its web portal (<http://www.nist.gov/hcsl>) is a “public resource for publishing, sharing, and finding important information” in this burgeoning landscape.

Progress by the Health Information Technology Standards Panel (supported by an ONC contract with ANSI and assisted by NIST) was reported by Dr. Peter Elkin, Professor of Medicine at the Mayo Clinic College of Medicine. The HITSP’s primary goal is standards harmonization, a complex operation culling important features from select extant standards and modifying others to promote workable healthcare information standards. Dr. Elkin also presented interesting work in combining two of his specialties, health vocabulary and health data representation – visual concept maps based on models elicited from general physician panels and also from specialist panels. As he demonstrated, medical ontology maps in various domains are widely different depending on the degree of specialization.

Focus on Collaboration and Interoperability

Lisa Carnahan and Bill Majurski from the NIST ITL had a poster on a Cross-Enterprise Document Sharing (XDS) project within the broader “Integrating the Healthcare Enterprise” project (IHE), sponsored by the Radiological Society of North America, the Healthcare Information and Management Systems Society (HIMSS), and the American College of Cardiology. The XDS project recognizes that electronic health records are in danger of falling into inaccessible silos unless strategies are put in place to share patient records across disparate enterprises. The XDS framework uses XML document registries (specifically, the ebXML business process library – cf. <http://www.ebxml.org/>) and a Patient Identity Cross-Reference Manager (PIX) to share multi-faceted clinical information while maintaining local control and ownership without compromising the privacy and security of the patient’s health information. Cross-enterprise document management is one of my research areas and very important in the realization of a National Health Information Network. I would be interested to see how the XDS framework is built in practice. One complication is that many electronic health record systems, such as the one I develop for Pediatrics, are database-driven, and documents are ‘virtual’ materialized views from the database. The alternate solution here, to share information between e.g. private practice and hospitals, is a community-based Virtual Private Network (VPN) for messaging and document sharing with authentication by, e.g., X.509 certifications. I can see both approaches used successfully as a NHIN takes shape.

Focus on Medical Devices

Dr. Julian Goldman, principal anesthesiologist in the Massachusetts General Hospital/CIMIT Operating Room of the Future and Program Leader of the Center for Integration of Medicine and Innovative Technology (CIMIT) Medical Device Plug-and-Play Interoperability Program, showed typical operating rooms of today, jammed with proprietary, non-networked equipment and fraught with potential dangers for misuse particularly when two or more devices are involved in a procedure. The challenges are evident: to enable seamless interoperability and to eliminate, via simple device automation, many of the human/device interaction mistakes which occur in today’s environments.

A futuristic approach to this problem was presented by Palo Alto Research Center (PARC) scientist Dick Balfanz in his “Obje” interoperability framework poster session. Obje dispenses with the usual notion of a TCP/IP protocol stack and the usual a priori requirement of service layer definitions and agreements in network communication. Instead, Obje keeps things general with a domain-independent programmatic “meta-interface” that rely on mobile code to enable devices and services to dynamically extend the capability of their clients. Thus, new devices and services can appear on the network without bothering with the installation of new drivers or firmware updates. Obje is a potential answer to the problem of interconnecting the huge variety of diagnostic tools and devices, each with their own monitors, data formats, and archiving software, available to physicians by allowing the interconnection of an ad-hoc mixture of

heterogeneous devices. In the Objé vision, mobile code floats across the network to “teach” generic monitoring stations how to display and analyze data. With ad-hoc interconnection, the physician’s width and depth of data access improves and hence his or her ability to reach accurate diagnoses and make informed medical decisions. The Objé framework is realized with JVM (Java Virtual Machine) and has been prototyped in consumer electronics. The researchers are hopeful it can be similarly prototyped with medical devices. More information can be found at <http://www.parc.com/obje>

About the Author

Dr. Mark Ginsburg received a PhD in Information Systems from New York University and is a member of the IEEE Medical Technology Policy Committee. He is currently the President of Seventh Rank Associates (<http://www.seventhrank.com/>), a provider of open-source solutions for Pediatric private practice office management and electronic health records.