

Health Sector Management, Duke University: The Fuqua School of Business (FSB)
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Duke University School of Medicine
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Delivering on the Value Proposition for Connectivity and Healthcare IT

April 23, 2009

Presentations and Discussion with Stakeholders

**Duke University: The Fuqua School of Business
Health Sector Management
Duke Health Technology Solutions
Duke Medicine**



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Meeting Organizers

- Asif Ahmad** VP and CIO for Duke University Health System and Medical Center;
Associate Dean, Academic Imaging & Computing
- Kevin Schulman, MD** Director, Health Sector Management Program, The Fuqua School of Business;
Associate Director, Duke Clinical Research Institute

Meeting Participants

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- Dan Aycock**
SY HSM Student, The Fuqua School of Business
- Michael Brown**
Enterprise General Manager, GE Healthcare
- Bill Burge**
Associate Partner, Global Business Services, IBM
- N. Blair Butterfield**
VP, Connectivity Solutions, GE Healthcare IT
- Patrick Cannoles**
Results Executive, Cerner; Duke University Health System
- Steve Cline**
Chair, HIT Strategic Planning Task Force for the Governor, Office of the Governor
- Janis Curtis**
Associate CIO, Duke University Health System
- Janet Dillione**
Chief Executive Officer, Health Services, Siemens Medical Solutions
- Pat Douglas**
Director, Administration and Fiscal Management, Duke University Health System
- Jeff Ferranti**
Associate CIO, Duke University Health System
- Joseph Gasque**
Region Vice President, Carolinas Sales, GE Healthcare
- Laura Gerald, MD, MPH**
Sr. Medical Consultant
- Dan Gitterman**
UNC-Chapel Hill and Office of the Governor
- Paul Goetzheimer**
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- William Ed Hammond, PhD**
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- Jim Hart**
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Associate CIO, Duke University Health System
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- Rajiv Kolagani**
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- Venky Krishnan**
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Software IT Architect, IBM

Delivering on the Value Proposition for Connectivity and Health IT Conference April 23, 2009

Kevin Schulman and Asif Ahmad hosted the “Delivering on the Value Proposition for Connectivity and Health IT Conference” on April 23, 2009 at Duke University’s Fuqua School of Business.

Health information technology has drawn greater attention in recent years and is gaining momentum as a key enabler of improvement in the quality of healthcare and patient safety. Our goals were to bring key stakeholders together to discuss the driving forces behind true connectivity in health IT (in a forum that incorporated the perspectives of practitioners and researchers), and to set the stage for further exploration that will lead to insights and targeted actions to achieve results at the state and national levels.

Keynote Address

Topic: Challenges in Achieving a ROI in Health IT Based on the Health IT Provisions of the American Recovery and Reinvestment Act of 2009

Speaker: Kevin Schulman, MD: Director, Duke University: The Fuqua School of Business, Health Sector Management Program and Associate Director, Duke Clinical Research Institute

Panel discussions

Topic: Connectivity: What Are the Frameworks for Creating Longitudinal Records for Patients?

Moderator: Asif Ahmad: VP and CIO for Duke University Health System and Medical Center; Associate Dean, Academic Imaging & Computing

Panelists: David McCallie: VP, Medical Informatics, Cerner
Ivo Nelson: Chairman, Encore Health Systems
Jim Nemecek: Sr. VP and GM of Ambulatory Care, McKesson

Topic: Developing Data Standards for Information Exchange in Healthcare Between Inpatient and Outpatient Settings and Across Facilities

Moderator: Mike Russell: Associate CIO, Duke University Health System

Panelists: William Ed Hammond: Professor Emeritus, Department of Community and Family Medicine; Professor Emeritus, Department of Biomedical Engineering; Adjunct Professor, Duke University: The Fuqua School of Business
Sandy Phillips: National Coordinator for HIE, Perot
Bob Robke: VP, Health Leadership, Cerner

Topic: Practical Informatics and Manpower Development for Health IT

Moderator: N. Blair Butterfield: VP, Connectivity Solutions, GE Healthcare IT

Panelists: Asif Ahmad: VP and CIO for Duke University Health System and Medical Center;
Associate Dean, Academic Imaging & Computing
Jeff Ferranti: Associate CIO, Duke University Health System
Sean Hogan: VP, IBM Healthcare and Life Sciences

Topic: What is the Public Process? How Should Consensus Be Determined and Achieved?

Moderator: Harry Reynolds, Jr.: VP and Information Compliance Officer, BCBS of NC

Panelists: Dan Gitterman: UNC-Chapel Hill and Office of the Governor
Ed Macko: Director of WW Healthcare and Life Sciences Solutions and CTO, IBM
Claude Snow: VP, Healthcare Solutions, EDS/HP

Presentation and Discussion

Topic: Focusing on the Effectiveness and Measuring the Impact of IT on Healthcare - Business Intelligence in Healthcare

Speaker: Janet Dillione: CEO, Health Services, Siemens Medical Solutions

Final session

Topic: Next Steps: Follow-on Meetings, Working Groups, Duke Serving as a Resource, etc.

Moderators: Kevin Schulman, MD: Director, Duke University: The Fuqua School of Business,
Health Sector Management Program and Associate Director, Duke Clinical
Research Institute

Asif Ahmad: VP and CIO for Duke University Health System and Medical Center;
Associate Dean, Academic Imaging & Computing

Context

The presentations and discussions focused on connectivity and industry strategies for health information technology (HIT) in response to the HIT provisions of the American Recovery and Reinvestment Act of 2009 (ARRA).

The meeting was held at The Fuqua School of Business at Duke University, and was attended by informaticists, healthcare providers, vendors, payers, policymakers and educators. The purpose of the meeting was to identify and discuss fundamental drivers of connectivity in healthcare IT.

In his Keynote Address, Dr. Kevin Schulman provided context for ARRA by summarizing its goals and describing the current issues of cost and quality within the US healthcare system.

Key themes of Dr. Schulman's presentation and of the following discussions are outlined below.

Value

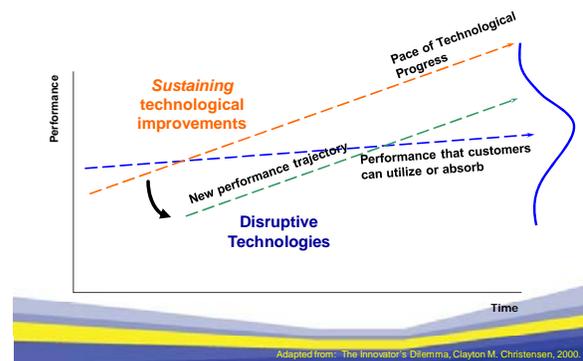
The US is currently spending more than all other countries on healthcare, with concerns regarding the value of this expenditure. Not only does the US system underperform that of other systems, it has been estimated that almost 30% of spending on healthcare (\$700billion) in the US does not result in improved outcomes.

In other industries, such as retail and telecommunications, IT has enabled increased productivity and value for consumers through competition and firm entry. The question posed to the group was: can healthcare IT provide a means to improve productivity and decrease costs as seen in other markets?

The Business Case for Healthcare IT

The personal health repository (PHR) space is largely an unregulated market in healthcare, and an ideal opportunity for new entrants into the marketplace (disruptive innovation). New firms can offer novel solutions, higher performance/lower cost (over time) and offer an opportunity to transform the current healthcare business model.

Disruptive Innovation: Firm Entry as the Economic Driver

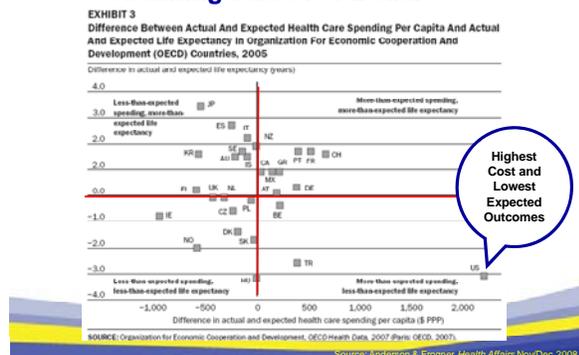


Connectivity

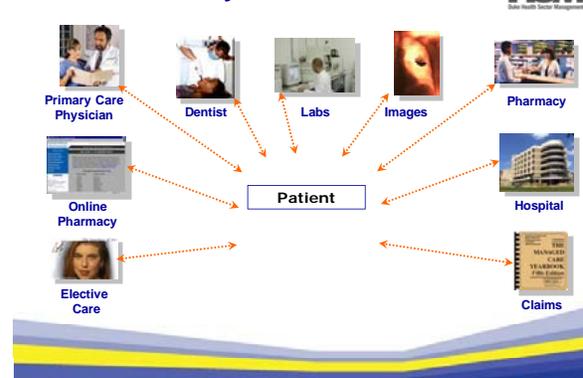
Connectivity and movement of information is critical to achieve increased financial returns from HIT investments. The current system is composed of data islands, with no interconnection between these data sources.

System level benefits from HIT investments can only be achieved through connectivity. Gains from this framework can be derived from reduction in redundant services, efficacy of treatment, reduction in administrative costs, and improvement in referral management and payer communication.

Health Spending In OECD Countries: Obtaining Value Per Dollar



Today: Data Islands



HIT Investment



Data Ownership

An alternative to data islands may be the personal health repository (PHR), which builds the system around the patient. Such architecture can facilitate development of new clinical services such as prevention or even disease self-management. The concept of patient-controlled health information requires a cultural paradigm shift, but would transform the healthcare business market to stimulate competition among providers based on the quality of the services they provide, not on access to health records.

\$100 billion system

- 5,500 hospitals: \$18 million
- 800,000 physicians: \$125,000
- 300,000,000 people: \$333
- 30,000,000,000 uses: \$3



However, investment at the population-level appears to be quite feasible at a small fraction of current annual health care costs per capita.

Ownership of Medical Information

Mark A. Hall, JD
 Kevin A. Schulman, MD

WHO OWNS MEDICAL INFORMATION? The one who gives care, receives care, or pays for care? All of the above? None of the above? Does it really matter?

In the emerging era of electronic health information, few other multi-faceted questions are more critical, more contested, or more poorly understood. The American Recovery and Reinvestment Act of 2009 allocates up to an estimated \$20 billion to implement clinical information systems, and it aims for the use of electronic health information for each person in the United States by 2014. It fails, though, to resolve who owns this massive increase in electronic information. This legal uncertainty presents a major obstacle to integrating and using information about a single patient from various clinicians and hospitals.

Furthermore, there are several common misconceptions about ownership. First, property law is only one of several legal regimes that control rights and responsibilities over economic goods. There others are contract, tort, and regulatory law. In some online, property rights are enforced against the world, meaning that everyone must respect them, even those who have no relationship with the owner, whereas contract, tort, and regulatory law depend on the relationships or interactions among the particular parties involved. The effect of other legal regimes may sometimes resemble property law, but the mechanisms of control are distinct. For instance, privacy law (which grows out of tort law) may appear to give patients property-like control, but privacy rights enable patients only to block access, not to sell the information, and privacy governs only clinicians and peers, not anyone else who might possess the information. Property law is shaped both by fundamental rights and



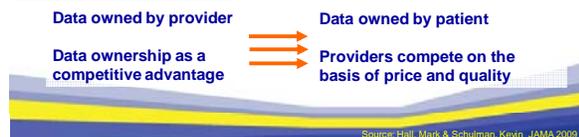
Incentives, Data Standards and Outcomes

Adoption



Economics of Push vs. Pull Strategies

Business Transformation:



Push
 (Can We Ever Pay Physicians Enough to Adopt?)



Pull
 (Can Consumer Demand Change Physician Behavior?)



Clarifying ownership of personal health data is a complex component of the healthcare IT transformation, including the rights and obligations of patients and providers regarding liability and security of personal information.

System Economics

If implementing healthcare IT required \$100 billion, assessing the allocated cost to each of the actors within the healthcare system would be an interesting exercise. Investment on the hospital-level provides an interesting result. Though the money required for hospital systems is more than ARRA currently provides, it is still within the realm of possibility. The lack of implementation at this level suggests a general concern about the ROI from this investment to hospitals. Allocating costs solely at the provider level would clearly be prohibitive for most physicians.

Effective implementation of healthcare IT will demand the establishment of data standards for data transmission and medical records. The PHR model needs to be standards-based to have the greatest utility to patients and providers. Variables can be measured from several perspectives.

Connectivity: What are the frameworks for creating longitudinal records for patients?

Moderator: Asif Ahmad, VP and CIO for Duke University Health System and Medical Center;
Associate Dean, Academic Imaging & Computing

Panelists: David McCallie, VP, Medical Informatics, Cerner
Ivo Nelson, Chairman, Encore Health Resources
Jim Nemecek, Sr., VP and GM of Horizon Ambulatory Care, McKesson

Overview

Health records are currently setting-specific (ambulatory records, primary care records, inpatient records, PHR, electronic health records [EHR]), and there is little connectivity between the different types of records. The discussion provided different industry perspectives on the general framework for longitudinal health records.

Discussion topics

- **Independent Health Record Banking/Trust model.**

The Health Record Bank would consist of consumer-owned data. Access is enabled by the consumer to chosen service providers (e.g., physicians, disease management support), and data accumulates upon each encounter with a service provider. Provider-tethered models would focus on customer service (e.g., refill requests, appointments), while payer-tethered models are problematic due to concerns regarding privacy/security of personal information. The Health Record Bank would be a health information exchange (HIE) that uses XDS-based sharing, as a network of health banks (some regional, some national) and when granted access, the provider would connect directly to the consumer's health bank.

- **Providers have not historically prioritized the development of EHR frameworks, but government investment has motivated providers to initiate change.**

The challenges to developing a framework for longitudinal health records are numerous and complex, and require a shift in healthcare culture toward collaboration (e.g., standardization of medical terminology). Computerized physician order entry (CPOE) exists, and algorithms to express data in a meaningful way are critical. Incentivizing providers to share information even when they use identical platforms/software is difficult due to lack of education and suspicion/fears of legal ramifications of information sharing. In order to move forward, the psychological barriers against the adoption of new technology (not the technology itself) must be addressed. Disincentives and misunderstandings must be removed regarding the legal issues relevant to information sharing, and the economic and clinical value must be clearly demonstrated. These efforts are more likely to succeed when utilizing incentives to change the existing reimbursement system.

- **The government is unlikely to mandate the adoption of healthcare IT, but consumers can be a strong market force.**

Government mandates can be helpful, but can also enable negative outcomes. Transparency of information reinforced by policy, however, can be an effective means of creating benefits. Also, consumer awareness of the potential for improved cost and quality of healthcare with the adoption of EHR will create a more competitive marketplace. A cultural shift towards an educated, involved consumer will provide the market driver. However, care must be taken to avoid the creation of an adversarial relationship between providers and patients. Additionally, consumer resistance to patient identification can restrict the ability to creating an effective system of EHR. A convincing and reliable means of assuring protection of privacy will be critical to gaining consumer support.

Developing data standards for information exchange in healthcare between inpatient/outpatient settings and across facilities

Moderator: Mike Russell, Associate CIO, Duke University Health

Panelists: William Ed Hammond, Professor Emeritus, Department of Community and Family Medicine; Professor Emeritus, Department of Biomedical Engineering; Adjunct Professor, Duke University: The Fuqua School of Business
Sandy Phillips, National Coordinator for HIE, Perot Systems
Bob Robke, VP, Health Leadership, Cerner

Overview: The participants discussed several health information systems, representative of the broad range currently in use – though none can be considered actual standards. The need for standards is evident, though it is unclear how to initiate implementation of data standards, and whether to use the legacy of current standards or develop new ones.

Discussion topics

- **There is an overwhelming amount of information, and a well-designed standard will enable the desired outcome.**
Many concerns about how to best design a data standard remain, such as: how to parse the most important and relevant information, how to discuss privacy issues, what is the need for any standard, and what is the desired outcome? Due to the complexity of healthcare IT and the need for expediency, the minimum information set must be defined. Based on the discussion, there was a consensus that allergies, medications and problems should be included in the minimum data set. Further, the information should be codified so as to be actionable when a doctor prescribes. It was proposed that inpatient data should include an admission history and physical summary, while clinical data would simply include basic information. Once the data standard is defined, it should be applied early on, at implementation of a healthcare IT system.
- **Several systems exist, none are codified standards.**
The Veterans Administration was rated an excellent, closed, working system, while documents such as fax (the current document standard for secure information transfer) and the Certification Commission for Healthcare IT (CCHIT) were considered workable (along with Health Level 7 [HL-7], Logical Observations Identifiers, Names, Codes [LOINC], Systematized Nomenclature of Medicine [SNOMED] and International Classification of Diseases- [ICD] 9/10). None, however, are broadly adopted data standards. Some provide functionality but do not translate to interoperability. Further, there is no clear way to discuss privacy and determine who has access to healthcare information.
- **The long-term goal should be the ideal solution, but the short-term goal is the workable solution.**
From the payer perspective, there is a groundswell of support for participating in an HIE. Payers are on the way to standardizing clinical information – once industry standards are set, payers will support it. Vendors see the need for implementation of data exchange, but it is not clear how to initiate an HIE. Should they abandon templates for a larger information database? It was suggested that space be allocated for narratives, but that a well-defined dataset is still ideal.
- **Use systems engineering approach to think of the information and create synergy – THEN identify the components of the system.**
Provision of a useful and effective framework will help facilitate constancy and adoption.

Practical informatics and manpower development for healthcare IT

Moderator: N. Blair Butterfield, VP, Connectivity Solutions, GE Healthcare IT

Panelists: Asif Ahmad, VP and CIO for Duke University Health System and Medical Center;
Associate Dean, Academic Imaging & Computing
Jeff Ferranti, Associate CIO, Duke University Health System
Sean Hogan, VP, IBM Global Healthcare & Life Sciences

Overview: Healthcare IT represents an enormous amount of information with a dearth of qualified manpower to manage the information. The transition from healthcare provider to healthcare informaticist appears to be more facile than the reverse; properly training people to use information effectively will improve healthcare outcomes and minimize costs.

Discussion topics:

- **Curriculum changes should be in medical schools by 2015 that will educate healthcare providers who are familiar with healthcare IT systems.**
The education system can be used to inculcate change, by teaching providers early in their training how to examine aggregate information. Ideally, healthcare informaticists would implement and maintain the process and use their analytical background to determine the minimum information required to provide care. This would develop not from a theoretical, but from a practical understanding of healthcare culture and operations. This would facilitate working within the existing culture, not against it, while applying an understanding of basic healthcare policy.
- **Informative metrics such as comparative efficacy and safety will improve patient care (e.g., translational medicine).**
Using meaningful comparators pre- and post-implementation to assess efficacy and impact will allow for the leverage of the information to improve healthcare. Practical IT needs people who understand the process from the provider perspective to implement user-friendly, fast and effective systems.
- **The changed economic landscape has resulted in a “reset world,” in which greater opportunities and challenges are contemporaneous.**
Business innovation and the delivery of solutions to produce specific outcomes are effective ways to use the opportunities created by ARRA. The development of workable partnerships between the government (incentives and mandates), academic institutions (skilled professionals and training facilities), and industry (innovators) will help reset expectations of practical informatics. Collaborative implementation of standards and mandates will enable expedient, practical IT.
- **What is the best way to achieve scale on process? What is gained from implementation without measure of efficacy?**
The best way to place informaticists will need to be assessed – does every institution need an informaticist to assess efficacy? Perhaps an onsite informaticist can best interpret outcomes by having a solid understanding of the culture of his/her healthcare institution, while external informaticists may help achieve scale on process. Regardless, implementation of healthcare IT must be linked with quality metrics, with qualified manpower who manage/modify scaling the process in a useful and appropriate manner.

What is the public process? How should consensus be determined and achieved?

Moderator: Harry Reynolds, Jr., VP and Information Compliance Officer, BCBS of NC

Panelists: Dan Gitterman, UNC Chapel Hill; Office of the Governor
Ed Macko, Director of WW Healthcare and Life Sciences Solutions and CTO, IBM
Claude Snow, VP, Healthcare Solutions, EDS/Hewlett-Packard

Overview: The process of reaching consensus will require collaboration between public (state and federal) and private (payers and providers) entities. Defining the basic requirements of healthcare IT implementation will enable improvement in healthcare costs and quality.

Discussion topics

- **Expediency is key to initiating healthcare IT.**
It is critical to set data standards as soon as possible, as too great a delay will empower the government to set industry data standards. The states' roles as payers of Medicaid empowers them to direct major change, and some states have led the way by using aggregate data and partnering with the private sector to work towards healthcare improvement through implementation of IT (e.g., the North Carolina Healthcare Information and Communications Alliance [NCHICA]).
- **Use the aggregate data collected by payers such as the Centers for Medicare and Medicaid Services (CMS) to assess the best financial incentive to opt-in to healthcare IT.**
CMS wants to enable cost-effective, quick results for Medicare, and accessing aggregate data on the healthcare consumer and performing a cost analysis will allow determination of the appropriate share of costs to pass on to the consumer. Delivery of cost-reducing solutions to a large player such as CMS can drive implementation of healthcare IT in many contexts.
- **The consumer must be informed/educated. Assuming US consumers are ignorant is a false assumption, and prohibitive to developing a competitive marketplace.**
Healthcare IT should be marketed as a trusted source of information that will include and have power to influence the public. If vendors can identify and communicate the benefits of adopting healthcare IT, they can then include and influence the public. It is best to bring the solutions to the public as opposed to waiting for consumers to demand solutions from vendors.
- **Will states compete for ARRA funds, will funds be released incrementally, or will it require participation?**
The first \$2 billion of ARRA is competitive, though some governors are more interested in competing than others. Initial implementation may be overrun with funds that follow later, and North Carolina is well-positioned to receive funding given its strong track record in developing and implementing effective healthcare IT. States are likely to act independently initially, but as a confederate once data standards are set. Connectivity bottlenecks may develop at the state levels, as there is a presupposition of HIE which does not yet have a framework.
- **Implementation of a stop-gap measure with a common standard is an achievable, necessary short-term goal that must be met before HIE can be developed.**
It is not yet clear how to pay people to implement the new technology that will facilitate HIE and interoperability. The anticipated four-year (2011-2014) process will have an intermediary "pre-HIE" to establish a framework for better connectivity. There are no standards for RHIOs between states, and establishing standards will require an open conversation between states to avoid incompatibilities and redundancies.

Focusing on the effectiveness and measuring the impact of IT on healthcare: Business Intelligence in Healthcare

Presenter: Janet Dillione, CEO, Health Services, Siemens Medical Solutions

“I cannot improve what I cannot measure.” –

Pat Gabow, MD, CEO Denver Health

- **A sea change is required to develop and adopt healthcare IT.**

ARRA is not simply a budget – it is a statement on the weaknesses of our current healthcare system. Healthcare has not delivered a ROI. The goal of ARRA is to create interoperability and meaningful change, with effective management of the transition points in connectivity (e.g., primary care to specialist; laboratory to hospital; hospital to pharmacy).

- **Current metrics will fail to compel providers, payers or consumers.**

Metrics have historically focused on time to procedure, and are used more often to improve customer service, not treatment quality and efficacy. Vendors will need to assess what information influences consumer decision-making regarding choice of provider or payer. Healthcare price drivers are complex, and vendors can differentiate themselves from one another by demonstrating improved health outcomes. Positive user and consumer experiences will value-add, based on identifying measures of outcomes.

- **What is the desired outcome? What are the metrics? From whom are data collected? Who interprets data and how? Which metrics will impact provider outcomes?**

The creation of ontology structures for healthcare will help clarify what metrics to use to improve outcomes. This assumes that healthcare delivery will be similar to a retail model, which is outcome based. Efficacy of healthcare IT isn't the measure, but the health outcome is the important information.

- **Does the consumer become king due to ARRA? Is this the beginning of the commoditization of healthcare? How can providers be incentivized? Should vendors market directly to consumers or to physicians?**

Some say that analytics should be used to compete within the business community, not for consumers.

Creation of transparency is important to facilitate research/clinical communication

- **Information silos/data warehouses exist – why not use them and reexamine how to improve healthcare?**

Information analysis may provide a competitive edge for vendors and provide a means of improving quality of care, as well. Transparency of the true cost of healthcare will identify the markup on services and what it is used for. Accountability is not as relevant at this point, since metrics are not outcomes-based.

- **Why hasn't healthcare outsourced IT to experts? Better healthcare is facilitated by IT, but why is IT so expensive to implement and maintain?**

Without data standards, it is difficult to outsource due to a lack of consistent structure. The constant customization of current healthcare IT means greater costs, and is prohibitive to outsourcing. A belief in the benefits of standardization needs to be nurtured through education of providers and consumers. Vendors need to identify aspects of healthcare that can be streamlined and simplified with greater transparency.

Future directions

Moderators: **Kevin Schulman, MD**, Director, Health Sector Management Program, Duke University:
The Fuqua School of Business, and Associate Director, Duke Clinical Research Institute
Asif Ahmad, VP and CIO for Duke University Health System and Medical Center;
Associate Dean, Academic Imaging & Computing

What can Duke do to serve the healthcare community via research and education?

Duke University, as a pioneer in healthcare IT, has a responsibility and obligation to take an active role in stimulating the economy. Duke can help identify leaders in practical informatics by creating a curriculum to target and develop students for careers in healthcare IT, starting at the undergraduate level.

Duke can serve as a practicum. The University can help develop training programs for practical informatics across the multiple disciplines that contribute to this effort - Fuqua, the School of Medicine, and the School of Nursing. Offers could extend to executive education programs, and could serve as electives for many other degree programs at Duke University.

If we build it, will they come? Yes. More workers need to be trained in informatics – but CEOs also need to be trained to understand the benefits of and roles of practical informatics. The impact on the Duke brand could be powerful if The Fuqua School of Business and Duke Medicine take the lead to build this program.

Outstanding questions: Participants enjoyed the discussion, the varied perspectives in the room, and the challenging topic (for Duke, for the industry, and for the US healthcare system). Clearly, there is need for more activities of this type. Building a hub of connection and collaboration at Duke would contribute greatly to this effort. Working with participants to develop training and career paths for Duke students would also be a valuable contribution.