Collaborative Initiatives at MIT
New Models for Health 3 – Future Health Systems
September 18, 2008 Meeting Synopsis

"Systems engineering has had an enormous impact in any number of fields, but at least from my perspective, it is only beginning to be applied in Healthcare. Part of the reason, I suspect, is that so many of the issues in Healthcare are difficult to quantify societal questions, such as, should you spend the next marginal dollar on prevention, on research, or on treatment of the stricken?"

Norman Augustine, Chairman & CEO Lockheed Martin Corp. (Fmr)

"Healthcare is business. Healthcare is therapies and clinical science, it's incentives, it's cultures. It is physical environments. It's products, it's approval processes, reimbursements, and the list goes on, but it's actually the intersection of all of that. If you don't understand how those all affect each other, then you will make the problem reductive. So, what we're trying to do is to understand the interconnected nature of problems."

Marco Steinberg, Associate Professor, Harvard Graduate School of Design; Strategic Design Director, Finnish Innovation Fund, Sitra

"Keep it simple. Don't make it so complex that you tend to care people away from attacking a big systemic problem. Don't make it so complex that people say, okay, I can understand it , but I can't implement it. I can't execute it."

Dana Mead, Chairman MIT

On September 18, 2008 Collaborative Initiatives at MIT hosted a meeting with approximately 80 participants from various healthcare fields as well as experts in other fields. The day was opened by Dr. Emilio Bizzi, President of the American Academy of Arts and Sciences and began with a brief discussion on the value of systems thinking by Norman Augustine, Chaiman and CEO Lockeed Martin Corp. (Fmr), and a presentation on applying systems thinking to Healthcare, particularly as it relates to Stroke, by Marco Steinberg, Associate Professor, Harvard Graduate School of Design.

The rest of the day was broken into three modules; ***Challenging Systemic Change, Healthcare – A Non-System*** led by Susan Dentzer, Editor-in-Chief, Health Affairs, Health Correspondent, PBS News Hour with Jim Lehrer; ***Frameworks for Systemic Change*** led by Amy Edmondson, Novartis Professor of Leadership and Management, Harvard Business School; and, ***Pathways for Action*** led by John Ullo, Senior Management Advisor, Schlumberger-Doll Research and Kerry Healey, Visiting Professor at the JFK School of Government and Former Lt. Governor of Massachusetts.

Although each module had specific topics for discussion the transcript shows great continuity of conversation throughout the day. Therefore, for the purposes of this synopsis we will not stick to the module schedule but follow various discussion threads. The conclusion will include a list of recommendations for possible next steps.

Synopsis:

We apologize up front if not all of the insight from the day is included in this synopsis. It is difficult to distill 103 pages of active discussion into a comprehensive review. We have included a list of quoted comments from the day at the end of the document.

The central theme for all of the day's discussion was Marco Steinberg's presentation on applying a systems approach to analysing Healthcare. Prof. Steinberg has done a major analysis on the provision of Stroke care and is currently in the pilot phase of his study.   The following is an abbreviated version of his presentation focussing on the systems approach. [To find out more about Prof. Steinberg's Stroke work please visit www.strokepathways.org]

"Defining the System" Marco Steinberg, Associate Professor, Harvard Graduate School of Design; Strategic Design Director, Finnish Innovation Fund, Sitra

"Our project is about strategic innovations. There's a lot of innovation in Healthcare and, I would argue, a lot of it is process improvement. We saw that in Stroke. A lot of the effort is focused on taking the existing engine and making it a little bit leaner and a little bit cheaper. The problem is that the engine is fundamentally flawed and you have to rethink its principles. So, that is the context of our effort and the use of the terms "strategic improvements" and "innovation"…

I think that society has been served well by deep and narrow specialties, but the nature of today's big picture challenges falls at the intersection of what we know. Not unlike cooking, the solution today is not in any one ingredient, but in the mix. And I think this is our big challenge. When we talk about issues like Healthcare, when we talk about issues like the environment, these solutions are actually in the mix, and yet, we don't have the institutions and the structures to actually build recipes. We have institutions and structures to deal with the flour or yeast, but not how those two interact with each other, and that is our challenge. I frequently ask people, what is Healthcare? Healthcare is business. Healthcare is therapies and clinical science, it's incentives, it's cultures. It is physical environments. It's products, it's approval processes, reimbursements, and the list goes on, but it's actually the intersection of all of that. If you don't understand how those all affect each other, then you will make the problem reductive. So, what we're trying to do is to understand the interconnected nature of problems. Because I'll tell you as an outsider, when you look at Healthcare, the problems are endless. The challenge is actually to understand which affect which other…

So, the problem with big complex problems is people within very defined areas assume too quickly they understand what the problem is. They don't understand the inter-related nature of elements within the system. So, key to this is the ability to take a step back and unpack a problem and understand how things are connected.

So, here's our challenge. You can think of this in terms of business, society, or academia. The traditional model -- and I'm painting a bit of a black-and-white picture here – much success has been built around deep disciplinary knowledge. The approach that we need to take is to develop integrative knowledge that can bring synthesis. To do the work that we've done, you need at least four attributes (it's probably more like 20 attributes- but that is for some other time).

1. The ability to work across multiple disciplines. There are lots of things, both interpersonal and disciplinary, that are necessary to create a continuum between cultures and discilplines.
2.   You need to be able to visualize a new kind of complexity. The problem with Healthcare is that we don't really even know how to think about it.
3. Be able to work with indeterminacy and relative position. We are never going to get all the facts about Healthcare. The only way to go is to begin to understand the relative nature of things and feel comfortable when we don't know all things.

4. Connect the "think," with the "do," with the "achieve." Lots of great ideas; very difficult to connect to the do and, at the end of the day, a lot of people do, but achieve not much. The big challenge today is actually how you create a continuum from inception to implementation.

So, this is the process. We are trying to take a step back and then we try to steer that decision-making to a better place. As you can already see -- and I'm going to get to this in the second -- not only do you have to have a process, but you have to have stewardship and leadership involved...

I wasn't going to go into this, but this is part of how we unpack. We came up with the idea of the Noah's Ark. You can't look at all the problems in the world, because you never get anywhere. The key is in capturing the representative kinds of the issues that give you the biggest spectrum of issues involved. A bit like Noah, who couldn't save every animal on the planet, you have to select representative problems that give you the greatest spectrum of your "animal kingdom". We do this in many facets of our work. One is actually doing a kind of more anthropology-like work, which is understanding firsthand the realities of the problems in the field. To do that, you've got to actually live and breathe the problem…

What we do fundamentally is before you redefine what the problem is, you have to go through a process of unpacking what you think you know and expanding your horizons. The more you see, the more you talk; the more you can observe the more that you have to kind of unpack… Then we have a hypothesis, working hypothesis, and this is where you begin to combine in the team that you found, a lot of different kinds of intuition. Intuition is the ability to make sense of something that's too complex, but that's an inroad to the problem…

Sometimes in the system, even though there's a lot of knowledge, there is that critical little patchwork of knowledge to connect this part of knowledge and that part of knowledge that you need to create, because it doesn't exist…

Now I'm also going to show you also a process that, as designers, is very important; we need to move through scales to understand a problem… it's back and forth. So we're going to move down in scale, not to gain more information, but to gain new insights…

Let me add a couple of concluding thoughts. I think our challenge, if we really want to create systemic improvements, is to develop more effective ways to understand today's "big picture" challenges. I put three words down here and I hesitate a little bit because I realize the "baggage" these words bring with them.
1. Strategic. Let's not just improve what we have, let's really rethink the principles.
2. System. They have to be about the interconnected nature of things.
3. Design. They have to apply a design approach to bring synthesis to contradictions and help define the architecture of interconnectedness.

Once we have defined our problem within this framework, we have to figure out how to translate this knowledge to action; the sort of science of stewardship. I think it's very important. Then, most importantly, is once you have action, to translate action into results. I think that there is a science of implementation that academia frequently looks upon as something that we don't do, but I think we need to develop the skills to better understand how you actually implement things.

So, I think there are two challenges for two groups. In academia, the kind of work that I'm sharing and the kind of problems that we're going to be talking about, actually defy how universities are organized --- and I'll leave it at that. (Laughter.) The other challenge, for industry, is that Healthcare has no single owner and there are many challenges with that. Within this, in both categories, there is the whole issue of incentives.

The current incentives work against today's innovation needs. The world has evolved very fast, our institutions have changed very slowly, and there's a broadening gap between how we think and what the world needs."

Discussion:

A series of questions were posed during the day and several others rose from the conversation. These themes will provide the format for this synopsis:
- The need for a clear mission and leadership.
- What are the barriers to systemic change?
- What can we learn from existing models? Such as the VA; IBM; Kaiser Permanente, Mayo, the Military Health System; models from other countries.
- Compare the value of micro vs. macro (regional vs. national) solutions.
- The role of Medicare.
- Is systemic change possible in a fragmented health delivery system?
- How do we make sense of conflicting incentives?
- What is the role of Healthcare in our society? Who are the stakeholders and what role should they play?
- Utilizing information technologies effectively.

Conversation revolved around the essential elements of a successful Healthcare system – having established that currently Healthcare in this country is best described as a 'non-system'.

Mission and Leadership

Two of the central themes for the day were the need for a clear mission and leadership or ownership of the problem. Session 1 started with various member of the Military Health Service [the Surgeons General of the Army and Airforce; the Deputy Surgeon General of the Navy; the Assistant Secretary of Defense for Health Affairs; the Commander of the Joint Task Force; the U.S. Army Commander for the Wester Regional Medical Command; the Secretary of Veterans Affairs and Under Secretary for Health for the Veterans Health Administration were all in attendance.] discussing the value of a clear mission, in their case the need for the Military Health Services to support the ultimate mission of defending the U.S. by providing a fit and prepared force. In the age of an all volunteer armed force this was seen as vitally important. In the VA the veteran is clearly the central figure around which the mission revolves. As a veteran can be in the system for a lifetime and live all over the country, prevention and access have been two major objectives.

A healthcare mission was put on the table; Don Berwick's Triple Aim ; "better health care, better health, and lower cost" [*Health Affairs* 27, no. 3 (2008): 759–769; 10.1377/hlthaff.27.3.759] this was expanded on by Steve Schoenbaum of the Commonwealth Fund to include "equity and access for all". There seemed to be general consensus in the room that this was the right direction. But, as Don Berwick noted and Prof. Steinberg commented earlier. "No one owns that".

Suggested Models of Change:

- Medicare was raised as a leader in healthcare. With the idea put forward that if Medicare policies could be systemized and de-politicized it could act as a leader in healthcare reform. In order to do this it was suggested that some mechanism to quietly remove Medicare from Congressional control is necessary.
- The IBM model was also put forward as an example of changing a system through leadership – deciding what roles are played centrally and what can be decentralized. As with M. Steinberg's model Lou Girshner went into the IBM community and learned first hand what the problems were.

- A need for a National, non-governmental leadership body was brought forward. Steve Schoenbaum summed up the concern, "Nobody's talking about the desirability of nationalizing industry in the United States. The question is, what is the regulatory structure, and what is the leadership structure that needs to be in place so that the rest of the system works and people can have trust and feel secure, and essentially the same kind of aims that people are having in the Military for Healthcare."
- The VA was seen as a success story in terms of redefining its system of care. Issues like increasing "points of access" to the system came from listening to their patients, their member population. Their current objective was seen as one of crossing care silos through a customer quality group. Although a "closed" system, the VA was seen to have many elements of a successful system – including clear mission and leadership.

Although there was a general consensus on the need for a common mission and some form of leadership the opinion on the ability to achieve these goals and the form in which either of these goals should be drawn were widely varied.

BARRIERS

Incentives

> "The first comment is that we have a cesspool of incentives across the entire Healthcare system and no one who systematically tries to map out, given the rule and regulations, how will you behave, what would happen if everyone behaved that way and is that what you intended?"
>
> **William A. Sahlman**, Dimitri V. D'Abrleoff Class of 1955 Professor of Business Administration, Senior Associate Deal for External Relations, Harvard Business School

Incentives were seen as one of the most widespread and disheartening barriers. Participants discussed micro-systems that had been set up with a clear mission and an active and engaged leader which achieved its goal of better patient outcomes at lower costs – only to find that they were losing money. The market system wasn't working, patients were not referred, reimbursement was pushing for more not less.

It was noted that in the past "better" care has always been linked to "more". The Surgeon General of the Army drew a parrallel with "effects-based weaponry, that is to say that it's not a function of how much ordinance you launch down range, it's more important what its effects are".

One participant pointed out that to have incentives work the system had to be prepared to "penalize bad behaviour".

Suggested models of change:

Many models were offered and suggestions made to address the incentive issue.

- Esko Aho offered the banking model in Finland in the 1990s.
- A suggestion of establishing targets and goals as opposed to market pressure was put forward.
- Andrew Dreyfus put forward the current BCBS of MA model for incentivizing positive outcomes and discussed the Massachusetts model. [Andrew Dreyfus September 23,2008 testimony to Senate Finance Ctte. http://finance.senate.gov/hearings/testimony/2008test/092308adtest.pdf]

- David Dietz of Liberty Mutual discussed the fact that they often cover people for upwards of 20 years and therefore it is in their best interest to do what they can to keep their customer healthy. "And I think that I would make the point that the company has not invested because we think it is a civic-minded thing to do; it's to our best interest to do so. That's an incentive. "
- Several participants felt that if something did not change soon the country would be facing a situation where change was mandated – similar to BRACC where the military was mandated to close Bases without debate.

Fragmented Delivery System

"a lot of us feel like the basic core problem is tremendous progress imposed under the very fragmented delivery system, producing chaos, which leads to inefficiency and safety issues and reliability issues and so, it is the work of organizing that very fragmented world out there -- the doctors who do not seek employment in the Kaiser's, into systems where they might speak the same language, use the same systems and we might be able to improve care beyond visits."

Thomas H. Lee, M.D., MSc, Network President and CE Parterns Healthcare Systems / Partners Healthcare Community, Inc.

Tom Lee articulated the concern that the current delivery system is too fragmented for a cohesive mission or single leadership mechanism to be put in place. This fragmentation can be linked with the "non-systemness" of healthcare in this country today.

Suggested models of change:

- "Elliot Fischer, Mark McClellan work on accountable care organizations is hugely important and how the financing system will help speed that work along, so the rest of the American health system starts to come together and organizations have some scale that they can take accountability for something other than a great hospitalization or a great doctor visit."
- Approach healthcare reform on a regional basis not national.
- Include doctors and stakeholders in the process of creating a working system. Partners was used as an example where values and mission were the same and all stakeholders participated in bringing the MGH and the Brigham together.

Information Dissemination

"One important element, …, is information technology. You know, you can go into the supermarket and scan the food. You can go to the furthest points of the world and get your checking balance and money, but you can go to a hospital not 50 miles from here and they wouldn't know anything about you."

Susan J. Blumenthal, MD, MP, CSP Senior Advisor for Health and Medicine; Former U.S. Assistant Surgeon General; Former Deputy Assistant Secretary for Women's Health. U.S. Department of Health and Human Services

Information technologies were raised in many different context.

o   An effective Electronic Medical Record was raised as both a means for patient care and a means of tracking outcomes.
o   The question was raised as to why it takes so long for good ideas, innovations, etc. to disseminate through the system. Denis Cortise of the Mayo Clinic gave a 17 year timeframe to widely disseminate what the right answer is and even longer to implement it. Within the Mayo Clinic he gave a 2 year timeframe.
o   Finally, information technologies were referenced in terms of involving patients, or potential patients, in the change process. Sites like FaceBook and patientslikeme.com were identified as current technology that can be tapped to involve stakeholders. As the VA listened to their customer base and increased the points of access to the system – these are seen as ways to learn what the public really wants.

System Interfaces

> "I just want us to focus back on the ideas that were shown in the beginning by Marco and I said we'd be coming back to this. Because notice in his diagram, he was drawing interfaces, where things were happening and all of a sudden the patient was no longer predictable ... that interface is the key component and I'm thinking of systems… When Steve brought up the issue of insuring people, we have an insurance system and we have a delivery system. It's at that interface that it's broken... The design of the system and how the interfaces occur are crucial. "

> **Denis A. Cortese,** MD, President and CEO Mayo Clinic

The system interfaces are the points of interaction between any two or more sets of known functions. As John Ullo noted the interfaces between the "system" and its stakeholders are at top of a hierarchical architecture. "You know, how does the user really interface with this service system, this product system, call it what you want, and this is where,..all the good attributes sit, right there at the top, at the interface. This is where performance sits. This is where access sits. All the good things that we want to ascribe to a health system sit at the interface."

Other

Some of the day's discussion was did not fall into general catagories.

•   Whatever system develops must utilize the power and knowledge of universities – which can study a large societal issue such as healthcare without bias; business – which can apply real world economic value and parameters; and, with government.

•   The Healthcare system must be a learning environment able to adjust to changing demand, to accept innovation and be willing to walk away from things that don't work; to think and make decisions "in a very disturbing manner".

•   "What system of production, with all of its non-linear dynamics and components, everything Marco showed us about stroke, would be capable of achieving that set of aims for a population of, let's say, one million people. Show it to me, and maybe have a derby. Show me different designs, and we'll look at the relative costs of performance, but that is something not done, and I think, yeah, the politics will play out, but why don't we get a design on the table? We don't even have one of those right now." **Don Berwick**

"… that's the heartbreaking thing, at this time in our history, in the year 2008 … with what we've got on the brink of individualized medicine, what we can do with the science of Healthcare delivery, which is system engineering, bringing that in to Healthcare. If we miss this opportunity, we will be behaving like the leadership in this country did thirty years ago, by ignoring the reality of energy problems." **Denis A. Cortese, M.D.**

OPPORTUNITIES

The mission of the Collaborative Initiatives at MIT is "to promote a systems-based approach to solving deep rooted societal issues by engaging experts from a broad range of disciplines both within and outside the scope of a problem".   Our aim in bringing this group together to discuss Healthcare issues was not to reinvent the wheel or to add one more competing organization to the effort but to help swell the wave towards real change in the Healthcare field. As was made clear on the day, in conversations leading up to the day and in the overwhelming feed back we have had – Healthcare is a vital issue which must be addressed. The issue of value – quality care for lower costs is paramount to our economy which cannot sustain current healthcare costs and to our society in which ever increasing numbers of people are unable to access even the most basic of healthcare services.

To this end, we have identified several areas of possible follow-up from the meeting.

1. The Military Health Service is a closed system with a clear mission and strong leadership yet they face issues of increasing costs and patient disatisfaction. During the day, successes and improvements in battle care were identified. This can be seen in the amazing care being received by U.S. wounded In the wars in Iraq and Afghanistan. One area that was identified as a critical challenge to the MHS is the concern over Post Traumatic Stress Disorder (PTSD) and mild Traumatic Brain Injury (TBI).   This is an area that could be well served by a systems-based study such as that done by M. Steinberg with stroke. There is significant interest on the part of the Military and VA to have such a study done. - ***Project in Development***

2. It was suggested that the Military Health System be used as a 'Beta Site' for Healthcare reform.

3. During the day it was noted that in several major Statewide comparison studies the top 8 states were consistantly ranked at the top. A systems based study of these eight states could identify common factors, support a regional model or outline some combination of the two. [www.commonwealth.org; www.statesnapshots.ahrq.gov]

4. Carry out a systems based analysis of U.S. Healthcare. Such a study would identify relationships between various Healthcare stakeholder groups , define the interfaces and highlight the consequences of change in any one arena to the system as a whole.

5. Facilitate further small group discussion of the relationship between Congress and Medicare and the utilization of Medicare as a model for healthcare reform.

6. Support the development of models to define incentives, the relationship between various incentives and healthcare outcomes, and unintended outcomes of different incentive models.

7. Encourage and develop academic models for the study of Healthcare System Design in partnership with business and government.

8. Develop a 'design competition' similar in scope to the Gate Foundation's *Grand Challenges in Global Health* to encourage designers, engineers and other systems thinkers to design a framework for a better Healthcare system. Don't just think outside the box – remove the box – and see what happens.

9. Facilitate small group meetings between Healthcare IT experts and IT experts from other sectors – the developers of the NYCE ATM system; Retail scanners; Fast Pass; National Transportation Safety Board; and Airline industry.