

A 3D map of the world rendered in white, showing the outlines of continents. A thick blue curved line runs across the bottom of the map area.

ROADMAP FOR NETWORKED ENABLED MEDICAL SCIENCE COOPERATION BETWEEN MIDDLE EAST AND THE WORLD

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Internet2 Middle East Emerging NREN SIG
Khalifa University, Abu Dhabi, 17 September 2012

Presentation Summary

- Regional Knowledge Trade
- Benefit Sharing (inter- and intra-)
- Centers for Learning
- Regional Investment in education and institutional infrastructure/campuses
- Building **Medical Research Networks**
- Open Health Systems and **Knowledge Infrastructure**

“

LEAVES OF GRASS

”

Lo, soul! seest thou not God's purpose from the first?
The earth to be spann'd, connected by net-work,
The people to become brothers and sisters,
The races, neighbors, to marry and be given in marriage,
The oceans to be cross'd, the distant brought near,
The lands to be welded together.

Walt Whitman, Leaves of Grass, 1855

THE MIDDLE EAST



- Important:
 - Strategically
 - Economically
 - Politically
 - Culturally
- Positive rate of growth
- Unemployment 30% particularly among young people aged 15–29

THE MIDDLE EAST

“...a surge in higher education, along with its privatization and its internationalization. While in 1940 there were only ten universities in the MENA countries, by 2000 there were 140 such institutions and by 2007 their number had reached 2601—two-thirds of which were founded after the 1980s.”

Vincent Romani, Brandeis University Crown Center for Middle East Studies and André Elias Mazawi, “Aspects of Higher Education in the Arab States,” *International Higher Education* 18 (Winter 2000)

ARAB DEVELOPMENT CHALLENGES

UNDP Report 2011

“There is no reason for this region not to attain the best developmental outcomes, given its substantial financial, human and natural resources. Even in the current difficult global economic and political context, an Arab resurgence is possible if only the energy of the region’s youth is marshalled to turn the region’s challenges into opportunities.”

MIDDLE EAST NREN SIG

John Chapman, Middle East SIG Coordinator,
CIO Georgetown University in Qatar



- Egypt
- Iran
- Iraq
- Kuwait
- Bahrain
- Oman
- Qatar
- Saudi Arabia
- United Arab Emirates
- Yemen
- Israel
- Palestine
- Jordan
- Lebanon
- Syria

BUILDING A KNOWLEDGE SOCIETY...

...KNOWLEDGE ACROSS THE REGION

- Constraints hamper acquisition, diffusion and production of knowledge despite significant human capital
- This human capital could offer a substantial base for an Arab knowledge renaissance.
- Disseminating quality **education**; Embedding **science**; Shifting towards knowledge based production; and Developing an enlightened Arab knowledge model are pillars for creating knowledge societies in the Arab world

Arab Human Development Report 2003

GROWING RESEARCH AND EDUCATION INFRASTRUCTURE

- Middle East countries are investing in medical education, treatment and research
- Partnering with institutions in US and other countries
- International faculty
- Research and education networks
- ...take the place they deserve in the world of knowledge at the beginning of the knowledge millennium.”

INTERNATIONAL CAMPUS

- Weil
- Georgetown

Internet2 Member Campuses

- Carnegie Mellon University (Qatar)
- Columbia University (Jordan)
- Dartmouth (Kuwait)
- Georgetown University School of Foreign Service (Qatar)
- Michigan State University (Dubai)
- New York University (Abu Dhabi)
- Northwestern University (Qatar)
- Rochester Institute of Technology (Dubai)
- Texas A&M (Qatar)
- Virginia Commonwealth University (Qatar)
- Weill Cornell Medical College (Qatar)

University

- American University in Cairo (AUC)



THE IDEA CAPITAL

According to John Sexton, President, New York University...

“The crown prince shares our vision of Abu Dhabi becoming an idea capital for the whole region...We’re going to be a global network university. This is central to what N.Y.U. is going to be in the future. There’s a commitment, on both sides, to have both campuses grow together, so that by 2020, both N.Y.U. and N.Y.U.-Abu Dhabi will in the world’s top 10 universities.”

AS AN EXAMPLE, DUBAI

- Amity University, Dubai
- Manipal University, Dubai
- BITS Pilani in Dubai
- University of Exeter
- Michigan State University
- University of Wollongong in Dubai

KING SAUD UNIVERSITY

The screenshot displays the King Saud University website interface. At the top, there is a Google Search bar with a dropdown menu showing search suggestions like "Q", "Q + ascii", and "Search for 'c' in History". The navigation menu includes "Colleges", "Research", "Administration", and "Resources". A prominent banner features the text "Top 200 according to the QS World University Rankings" with a sub-headline "King Saud University's status has risen yet again, placing 200th in the 2011 QS World University Rankings." Below this, there is a "News" section with a headline "Rector Al-Omar Defines Teaching Standards for KSU Faculty .." and an "Events" section listing dates and topics such as "38th Seminar on Imaging in Ophthalmology" and "Rhinology Research Chair Conferences & Workshops". A sidebar on the left contains various links and search results. The bottom right corner features a graphic with stars and the text "Prestigious Shanghai Rankings lists King Saud University among world's top 300 universities".

MIDDLE EAST KNOWLEDGE GATEWAY

- Oman Knowledge Identification Federation System (Oman KID) as a possible model for a Middle East Knowledge ID Federation
- Incorporate best practices, tools and technologies from across the world not just US
- Create a Middle East Knowledge Gateway
- Death of Geography as Barrier for Knowledge

MIDDLE EAST—KNOWLEDGE TRADERS

- Middle East has a strong tradition of knowledge trade
- As in history be the trader of knowledge between the east and west
- Use knowledge for its own development
- Share it with the world

MIDDLE EAST & NORTH AFRICA (MENA)

- Islamic countries which constitute what is known as MENA region were the harbinger and repository of knowledge The Library of Alexandria,

HISTORIC RELEVANCE

- Nasir al-Din al-Tusi publishing works on astronomy, ethics, mathematics and philosophy that marked him as one of the great intellectuals of his age in Maragha and Alamut in the 13th and 14th centuries
- The Library of Alexandria

How Islam Won, and Lost, the Lead in Science

- “Commanded by the Koran to seek knowledge and read nature for signs of the Creator, and inspired by a treasure trove of ancient Greek learning, Muslims created a society that in the Middle Ages was the scientific center of the world.”
- “Nothing in Europe could hold a candle to what was going on in the Islamic world until about 1600,” said Dr. Jamil Ragep, a professor of the history of science at the University of Oklahoma.
- “It was the infusion of this knowledge into Western Europe, historians say, that fueled the Renaissance and the scientific revolution.”

The New York Times

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October 30, 2001

How Islam Won, and Lost, the Lead in Science

By DENNIS OVERBYE

Nasir al-Din al-Tusi was still a young man when the Assassins made him an offer he could not refuse. His hometown had been devastated by Mongol armies, and so, early in the 13th century, astronomer and philosopher, came to dwell in the legendary fortress city of Alamut in the Persia.

He lived among a heretical and secretive sect of Shiite Muslims, whose members practice tactics and were dubbed hashishin, legend has it, because of their use of hashish.

Although al-Tusi later said he had been held in Alamut against his will, the library there was of excellence, and al-Tusi thrived there, publishing works on astronomy, ethics, mathematics marked him as one of the great intellectuals of his age.

But when the armies of Halagu, the grandson of Genghis Khan, massed outside the city it was trouble deciding where his loyalties lay. He joined Halagu and accompanied him to Baghdad. The grateful Halagu built him an observatory at Maragha, in what is now northwestern Iran.

Al-Tusi's deftness and ideological flexibility in pursuit of the resources to do science paid off. Modern astronomy, scholars say, leads through the work that he and his followers performed in Alamut in the 13th and 14th centuries. It is a road that winds from Athens to Alexandria, and Córdoba, through the palaces of caliphs and the basement laboratories of alchemists, just by astronomy but by all science.

Commanded by the Koran to seek knowledge and read nature for signs of the Creator, a treasure trove of ancient Greek learning, Muslims created a society that in the Middle Ages was the world. The Arabic language was synonymous with learning and science for 500 hundred years; can count among its credits the precursors to modern universities, algebra, the names of scientific notion of science as an empirical inquiry.

"Nothing in Europe could hold a candle to what was going on in the Islamic world until a Jamil Ragep, a professor of the history of science at the University of Oklahoma.

It was the infusion of this knowledge into Western Europe, historians say, that fueled the scientific revolution.

"Civilizations don't just clash," said Dr. Abdelhamid Sabra, a retired professor of the history who taught at Harvard. "They can learn from each other. Islam is a good example of that meeting of Arabia and Greece was one of the greatest events in history, he said. "Its scientific

NETWORK-CENTRIC BIOMEDICINE

...toward a learning healthcare system

- changing the nature of discovery
- changing the cultural process of knowledge acquisition
- changing knowledge application
- changing education and training

BIOMEDICINE: A COMPLEX ADAPTIVE SYSTEM

...“the whole is more than the sum of the parts”

- Diverse stakeholders: multidimensional, interacting “**ecosystem**”
 - Industry, Academe, Government, **NGOs**
 - Physicians, Regulators, Researchers, **Payors, Consumers, Public Health Officials**
 - Biology, Chemistry, Medicine, Business, **Sociology, Anthropology**
- Adaptive behaviors (dynamic as opposed to static)
- Emergent properties (or unintended consequences)
- Interdependencies
 - Resources
 - **Information**

PAVING THE ROAD

- Approach as **Ultra Large Scale Systems** problem
 - “**City planning**” as opposed to “building architecture”
 - “**Building codes**”
 - Over-arching **framework**
 - **Incremental**, problem-directed, implementation
 - Bias toward “**working code**”
- **Coalition of the Willing**
- **Policy** to address **regulated environment** and **cultural barriers**

ADAPTIVE APPLICATION

- Approaching **Biomedicine as a Complex Adaptive System** may help address some of the challenges it currently faces
- Information, and as such Information Technology can serve as the glue to **connect the Ecosystem**
- It is **technically feasible** to create and deploy technology to exchange information within and between members of the ecosystem
- A **multi-stakeholder, multidimensional community** will be necessary to create a sustainable ecosystem

OPEN HEALTH SYSTEMS LABORATORY

OPEN source
of knowledge

LABORATORY
for people to
drive in their
innovations
and ideas



Pertaining to
HEALTH

Information
SYSTEMS as
a tool

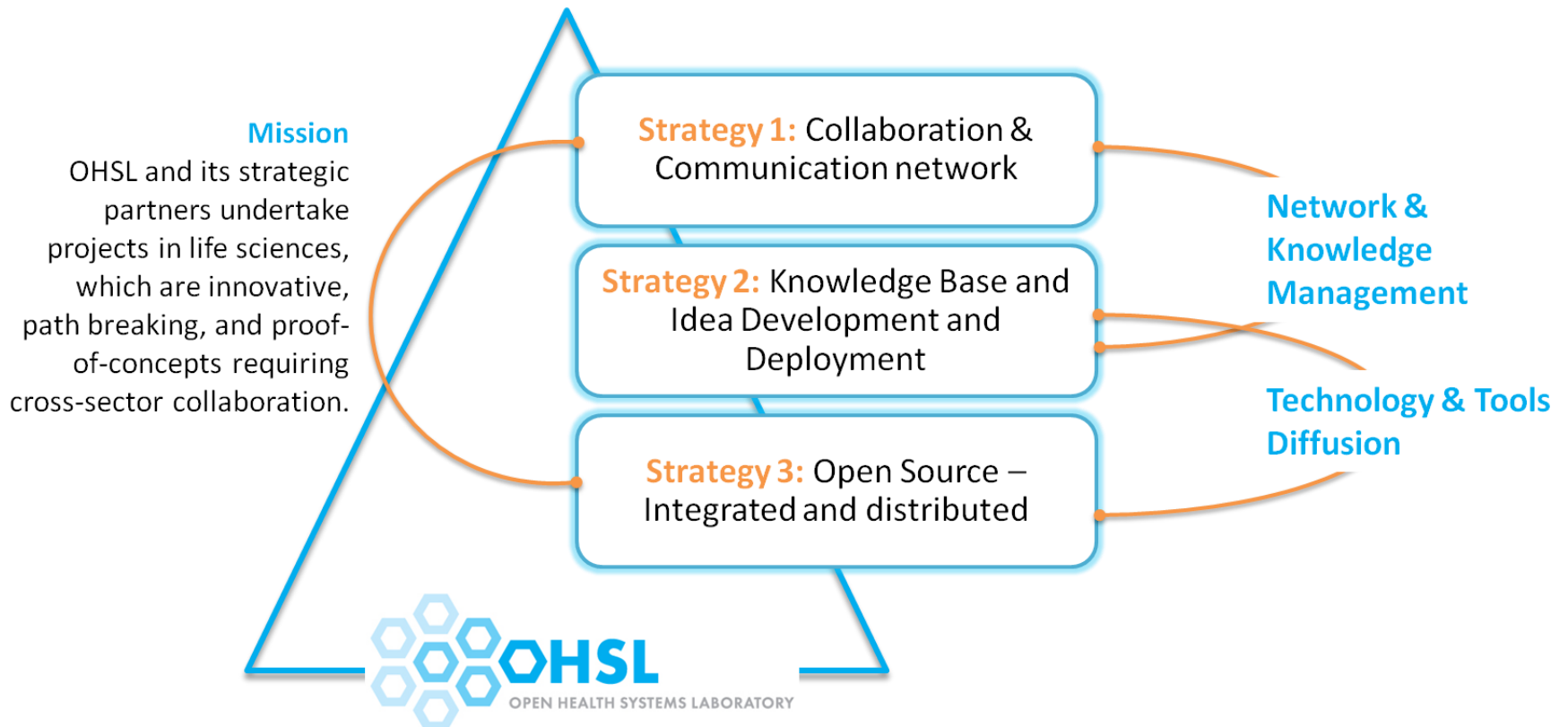
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In today's environment, hoarding knowledge ultimately erodes your power. If you know something very important, the way to get power is by actually sharing it.

”

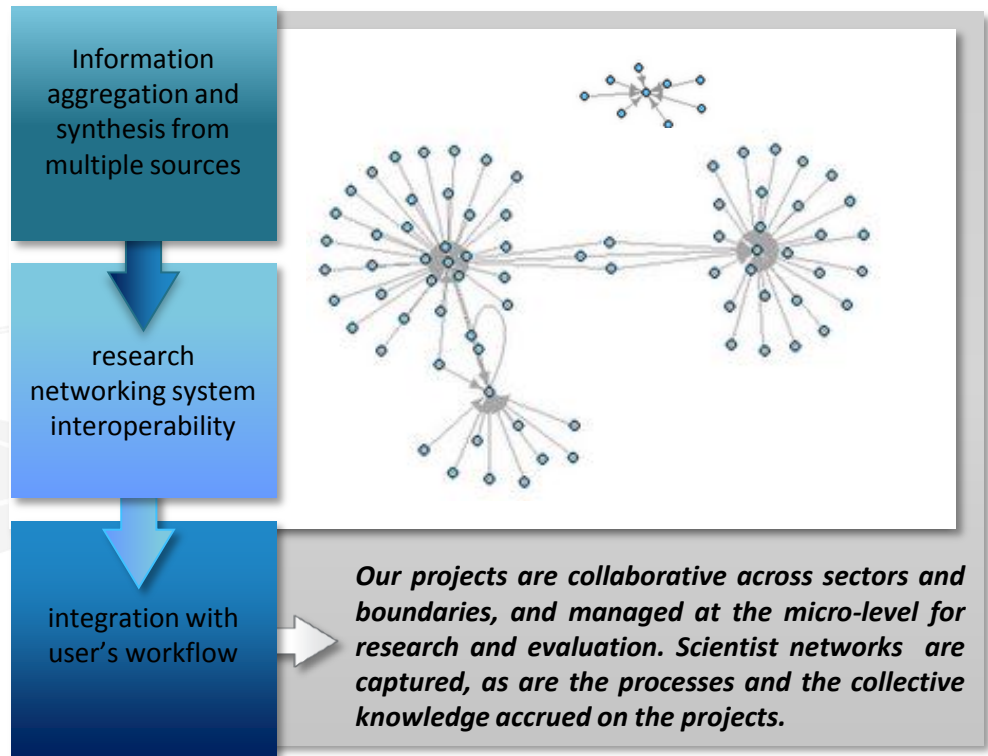
Joseph L. Badaracco, John Shad
Professor of Business Ethics at Harvard
Business School

COLLECTIVE STRATEGY FOR LEARNING AND DEVELOPMENT

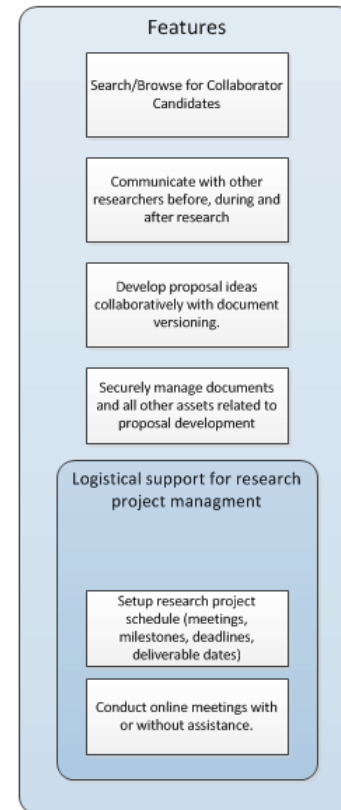
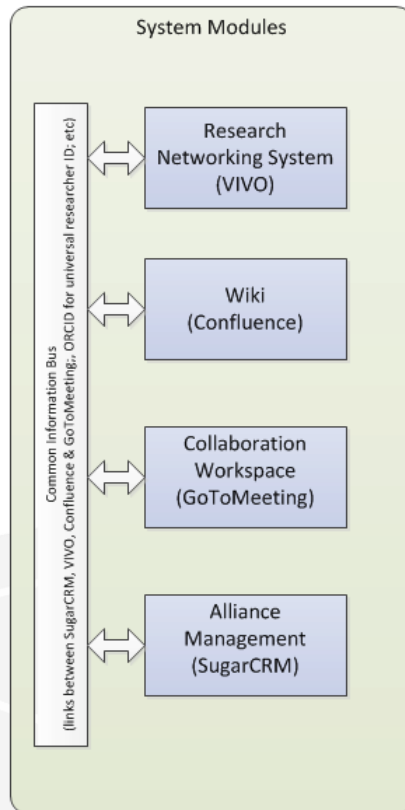


RESEARCH NETWORK SYSTEMS (RNS)

Research Networking Systems (RNS) are systems which support individual researchers' efforts to form and maintain optimal collaborative relationships for conducting productive research within a specific context.



GLOBAL CANCER COLLABORATORY



Paul K. Courtney, MS, Dana-Farber Cancer Institute

COLLABORATIVE PROJECT CONCEPTS

- **Encouraging pre-competitive collaboration** among scientists; mapping research resources worldwide; connecting collaborators leveraging the semantic web and increasing capability of social media and open source tools.
- **Mapping sources of funding** and support of medical research worldwide and working with funding agencies and foundations to address the needs of global medical research.
- **Building and managing international consortia** that will address provocative questions of medical science with a view to reduce the global burden of disease.
- **Creating a global knowledge cloud for medical research and treatment** to support global health with a team science approach and using biomedical informatics, information technology and International Research Network Cooperation (IRNC) .
- **Promoting open source**, interoperable, standards based software and providing inventory, integration, training, and support.

PROJECT CONCEPTS CONT.

- **Building a global community** of users for deployment and co-development of caBIG (cancer Biomedical Informatics Grid)
- **Creating a globally shared cyber-infrastructure for medical research** including high performance computing (HPC) for life sciences with advanced network connection, in partnership with University Corporation for Advancement and Internet Development (UCAID/Internet2), and Mid-Atlantic Crossing (MAX).
- **Initiating a pre-competitive research consortium** for in silico drug design and development from botanical and herbal molecules.
- **Supporting innovation in biomedical research** including biospecimen, biomarkers and clinical trials, especially emerging models for Comprehensive Dynamic Trials, Adaptive Trials, and Virtual Trials.
- **Promoting information proficiency** and meaningful use of human-centered, outcomes-oriented appropriate technology, where the ability to adopt and adapt resides with the user community.

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