

2010

Dr. Minna Allarakhia,
Department of
Management Sciences,
University of Waterloo
200 University Avenue W.
Waterloo, ON, N2L 3G1
E: minna@alum.mit.edu

BIOENDEAVOR: ANALYZING KNOWLEDGE MARKETS IN THE LIFE SCIENCES

BioEndeavor seeks to understand how knowledge markets evolve, are structured, and managed across the life sciences.

TABLE OF CONTENTS:

Objectives...	3
Organizational Structure...	4
Research Agenda...	5
Knowledge Management Repository...	7
Partnerships...	8

BioEndeavor Objectives:

There are several complexities driving the formation of knowledge markets (KMs) in the life sciences namely, knowledge complexities—with knowledge exhibiting high complementarity and high applicability across domains; technological complexities associated with interdependencies between technologies, the need for sophisticated equipment, as well as the scope and scale of research; and commercialization complexities associated with technology transfer and product development. BioEndeavor seeks to understand how knowledge markets evolve, are structured, and managed across the life sciences.

Knowledge markets have considerable applicability as the bio-convergence paradigm evolves—where the biological, information, and even devices paradigms intersect. Many of complexities of the current systems biology (information) paradigm will have even more serious consequence as firms seek to develop synthetic devices, manipulate genomic information to develop new organisms, or apply knowledge assets to new domains including the energy and environment domains.

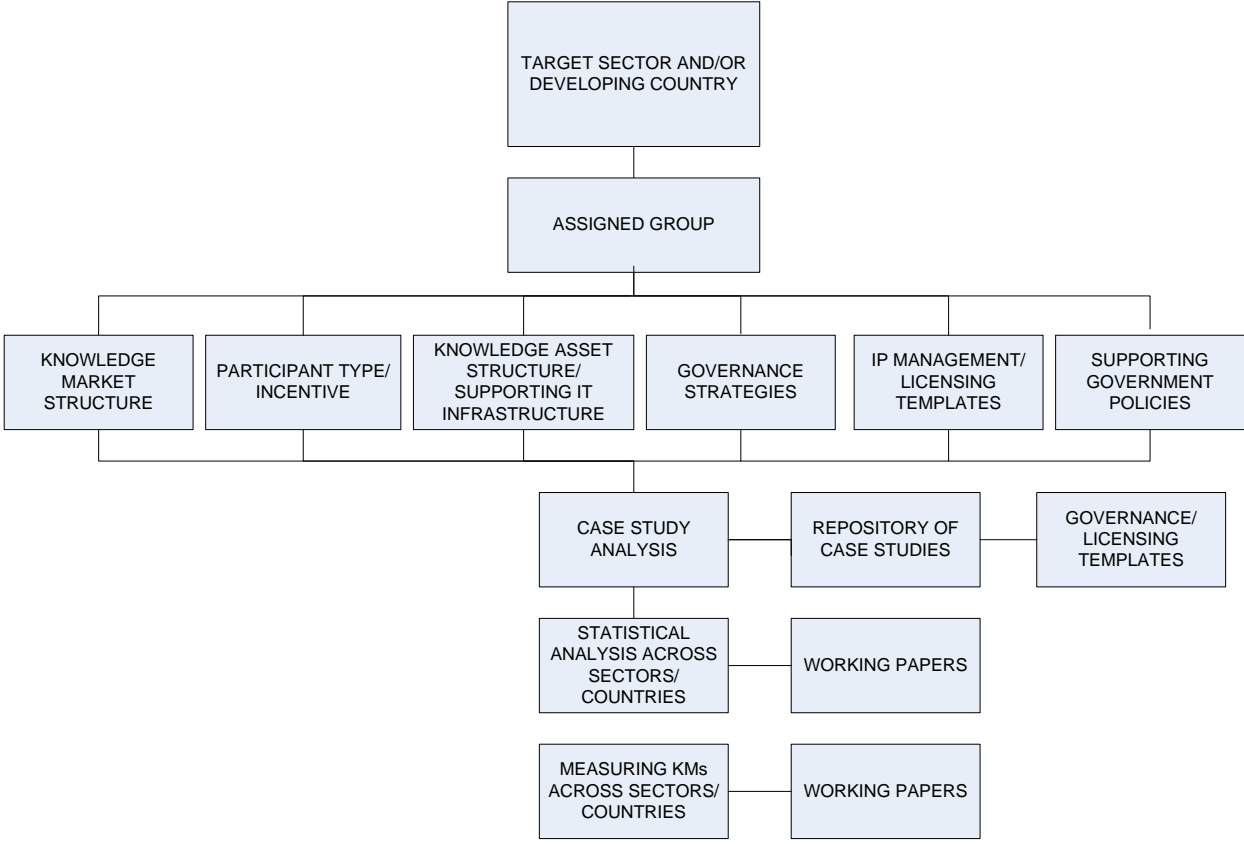
Based on the selection of target sectors for analysis i.e. industries and domains of strategic importance to members, subprojects can be designed to better understand the incentives for participation in KMs, the structure of KNMs across sectors and across sector value chains, the structure of knowledge assets being produced and disseminated, governance rules, licensing/knowledge management agreements, and supporting government policies. The development of a repository of governance strategies across sectors including any licensing agreements should enable stakeholders to effectively manage knowledge assets from the outset of any collaborative effort.

As knowledge markets become more common, it is deemed important to pay attention to broader access and equity issues. Are knowledge markets open to participants from a wide variety of countries? Do they help or hinder the flow of knowledge across borders? How do lesser developed countries tap into these structures? (OECD, 2009)

With respect to developing countries and capacity development, members from such countries can provide a starting point in terms of country selection and analysis. Beyond country selection, it will be necessary to select key target sectors for analysis. The governance strategies and outcome from the use of KMs for capacity development in developing countries can provide a template for other such initiatives; the above repository should therefore include KMs from developing countries.

BioEndeavor: Organizational Structure

Groups of members/countries can be charged with the analysis of KMs across individual sectors and developing countries for the purpose of case and statistical analysis, as well as creation of the repository of governance/licensing strategies. One possible organization including outcomes is as follows:



BioEndeavor: Research Agenda

Knowledge markets cover a wide variety of types of data, information and knowledge, including: databases, services, materials, compounds, software, methodologies, expertise, as well as any other patentable inventions. What is traded is a combination of explicit know-how, physical materials, methods as well as tacit knowledge (OECD, 2009). BioEndeavor seeks to determine the driving motivation for participation in a knowledge market as a function of knowledge asset structure, product development paradigm, and phase of participation (upstream discovery research vs. downstream product development). By adopting a knowledge perspective including paradigm, phase, and subject matter focus, it may be possible to correlate the structure of knowledge markets to knowledge asset types and the subsequent management of knowledge assets.

Phase 1: Target Sectors to be analyzed by BioEndeavor

Genomics-Upstream Genomics; Downstream Drug Development

Synthetic Biology-Upstream research

Nanotechnology-Upstream research

Energy and the Environment-Upstream research

Objectives:

- Understanding Knowledge Markets
 - Typology of Market, Knowledge Asset Structure, IT and Policy Infrastructures, Outcomes
 - Repository of Models-Case Studies (Typology, Participants, Knowledge Assets, Outcomes)

- Understanding the Management of Assets in Knowledge Markets
 - Governance and Intellectual Property (IP) Management
 - Repository of Knowledge Management/IP Management Templates/Contracts

As knowledge markets become more common, it will be important to pay attention to broader access and equity issues. How do knowledge markets address global – or local – health challenges, as is done in public private partnerships? How is distributed knowledge harnessed through knowledge markets to address specific public health challenges – for example, AIDS and TB in South Africa? Can this model be expanded? (OECD, 2009)

A starting point for example can be an analysis of the NEPAD Biosciences Networks. The NEPAD/African Biosciences Initiative is being implemented through regional networks of laboratories and technoparks that are involved in

carrying out cutting edge research and development and in transferring biosciences technologies. The governance strategies and outcomes from these networks can provide a template for other such initiatives seeking to enable capacity development in under-developed markets. Other such initiatives include the Indian Open Source Drug Discovery Network, the African Network for Drug and Diagnostics, as well as the health partnerships listed by the IFPMA for HIV/AIDS, TB, Malaria, tropical diseases, preventable diseases, and chronic diseases. Phase 2 of the project will therefore closely examine the role of knowledge markets as enabling capacity development in selected emerging markets.

Phase 2: Emerging Market to be Analyzed by BioEndeavor

Selected Markets: India, Brazil, East Africa

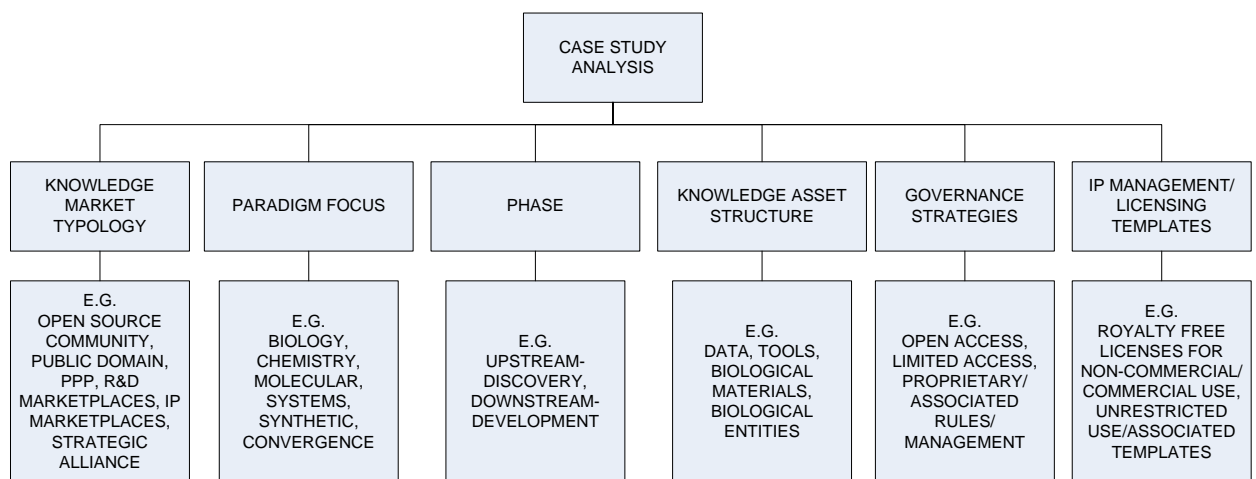
Objectives:

- Understanding Knowledge Markets in Emerging Markets
 - Understanding the Management of Assets in Knowledge Markets in Emerging Markets
 - Training in Knowledge Management for Emerging Markets
 - Partnership Development
 - Education-Model Development and Governance Structures
 - IP Management-Knowledge Dissemination and Licensing
-

BioEndeavor: Knowledge Management Repository

Allarakhia, Kilgour, and Fuller (2009) recently analyzed 39 open source genomic, proteomic and/or systems-based consortia to better understand how such consortia of public and private sector participants jointly create and manage biological knowledge assets in the post-genome era. Allarakhia, Kilgour, and Fuller (2009) found that consistently consortia differentiated between disembodied knowledge in the form of raw data and embodied knowledge created by consortium members in the form of tools, biomaterials, and reagents. Although data were mandated in most cases for almost immediate release, tools, biomaterials, and reagents could be appropriated and licensed to consortium members and the public at large. Interestingly, this appropriation was regulated in most cases by the provision of rules regarding licensing terms. Supporting data and materials sharing policies provided by the National Institutes of Health (NIH), the Wellcome Trust, the Creative Commons, the Biological Innovation for Open Society, and even private sector firms such as Open Biosystems, enabled for relatively easy access to disembodied and embodied knowledge created within consortia.

It is proposed that as part of the BioEndeavor Initiative, a repository of governance strategies, including any licensing templates be created as has been developed by BiOS and the Creative Commons. Ultimately, the goal of this repository should be to enable stakeholders to effectively manage knowledge assets from the outset of any collaborative development effort including managing those placed into the commons. The suggested infrastructure for this repository is as follows:



BioEndeavor: Partnerships

Call for Partnerships:

BioEndeavor seeks partnerships with various institutes in Canada, the US, and in the markets to be targeted by the network that are interested in the above research questions including institutes that are interested in the development of and application of knowledge markets in the life sciences.