Blueprinting a Knowledge Sciences Center to Support a Regional Economy

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Abstract. As cities and regions transform from an industrial to a knowledge economy, there is a need to build new working relationships among academic, business communities, labor and workforce, civil society, and the technology sector – to create Knowledge Cities. A Knowledge City values all kinds of knowledge, is grounded in an economy that runs on knowledge and intellectual capital, and encourages knowledge markets and transactions. The 21st century knowledge economy is dependent upon knowledge cities and regions, representing a major shift from the industrial economy. Transforming an industrial city to a Knowledge City is not a trivial task. It requires that all members of the society make the transition together. Currently, there are no institutions that can facilitate this role. This paper considers how a Knowledge Sciences Center might fulfill that role, and reports on the thoughts of over 200 participants of the Knowledge Sciences Symposium held in Canton, Ohio, and Washington DC in 2013. The paper also references recent initiatives to establish Knowledge Sciences Centers in the Eastern and Midwest regions of the United States. The role of a transformational leader in establishing a Center is also highlighted.

Keywords: Knowledge sciences center, transformational leadership, use cases, knowledge communities, knowledge economy, economic transformation, Knowledge Sciences Symposium

1. Knowledge Sciences Symposium

There is a need to redefine many of our institutional relationships and the way that our institutions work as we transition to a knowledge economy and a knowledge society in the 21st century. No aspect of society remains unchanged in a knowledge economy – every sector, every individual, every organization and business changes. What we value shifts – intellectual capital is as important as is financial or physical capital (Andriessen 2004) (Bontis 2001) (Bontis 2002) (Bounfour and Edvinsson 2005) (Kratke 2011). In an industrial economy, academia was a haven for cutting-edge knowledge. It was *where you went* to learn. Solutions to industrial economy challenges are structured and managed because industrial economy challenges are linear, predictable and manageable.

In the knowledge economy, there is as much or more knowledge being created outside of academia as there is within (Peters 2007). Knowledge economy challenges are chaotic, dynamic and "wicked". The knowledge economy is not as segmented or hierarchically structured as was an industrial economy – the transformation requires that all sectors and all stakeholders move together rather than move individually. Businesses understand the challenges of competing in a knowledge-based economy. Academia needs to learn from and deliver outcomes that can be used by business. Technology needs to move away from an industrial way of working or designing products for structured work to designing for a knowledge economy. The labor force needs to continuously learn – and learn not just from business or from union provided training – but to engage with academia. Learning today goes beyond formal degree programs. MOOCs, workshops, online webinars, in house training, and continuous lifelong learning are the norm. Academia needs to provide learning opportunities not just for those who can pay for formal credentials but to those who need to learn (Vardi 2012) (Rodriguez 2012).

Knowledge Cities are emerging all around the globe from the remnants of industrial cities (Baqir and Kathawalla 2004) (Brenner and Kell 2003) (Carillo 2004) (Carollo 2006) (Castells and Hall 1994) (Dvir and Pasher 2004) (Edvinsson 2006) (Ergazakis et al 2009) (Garcia 2007) (Goldberg Pasher and Sagi 2006) (Matthiessen Schwarz and Find 2006) (Metaxiotis and Ergazakis 2008) (Ovalle Barquez and Salomon 2004) (Papalambros 2011) (van Winden et al 2012). The transition, though, does not always include all members or organizations of the industrial city.

In September 2013, an emergent community of 200 people from across the country gathered in Canton, Ohio, and in Washington DC, to hold a Knowledge Sciences Symposium (www.kent.edu/slis/programs/iakm/symposium/index.cfm).

The purpose of the Symposium was to bring together knowledge management thought leaders from businesses and organizations, technology sector, academia, civil society organizations and the broader workforce to design a blueprint for a Knowledge Sciences Center in order to support the transformation of local industrial economies into the 21st century knowledge economy. The Symposium discussions were preceded by five webinars in July 2013.

The Symposium participants ("Participants") designed a blueprint for a 21st century Knowledge Sciences Center that focused on learning and career development, research and development, advocacy, advising and outreach and partnerships. The goal of this paper is to share that blueprint with the knowledge management community in order to elicit feedback and to find other people interested in moving the vision forward.

1.1 Rationale for a Knowledge Sciences Center

Participants envisioned a Knowledge Sciences Center as a source that would help a local economy and society make an effective transition to the 21st century knowledge economy. It was important to capture within the name of this Center the idea that the activities would go beyond what has typically been described as Knowledge *Management*. As a *science*, the range of activities would need to span the theoretical and academic foundations as well as the commercial and practical applications. The Knowledge Sciences Center we envisioned required a new blueprint if it was to serve this purpose.

1.2 Existing Models

There are many examples of research institutes,, science centers and think tanks, but none that aligned with the community and economy focus of the Knowledge Sciences Center. Research institutes and science centers are designed to leverage expert knowledge, often focused on theoretical research or the R&D needs of specific funding organizations (Anttiroika 2004) (Appold 2003) (Chen and Choi 2004) (O'Mara 2005). The intended stakeholders are other highly credentialed or deeply resourced organizations, and the engagement models are heavily dependent upon public or endowment funding sources. Another example of a science center is a Think Tank where experts focus on investigating current topics for the purpose of advocacy or public policy development (Mendizabal 2010) (Goodman 2005). While these models certainly serve a purpose, Participants agreed that they do not meet the needs of a city or region making the transition to a knowledge economy. There was a clear consensus that a new model was needed.

1.3 Design Issues

The Participants envisioned a new kind of Center that would act as a bridge between the worlds of academia, business, labor and technology, and could find no existing models to use as a blueprint. The design and vision emerged as we explored five issues (Figure 1). We needed to know *who* would participate in the center (Issue 1). We needed to know *what* kinds of activities the center would support to achieve its goals (Issue 2). We needed to know *how* stakeholders would *engage* (Issue 3). We needed to know *how* we would *fund* the Center (Issue 4). Finally, we needed to know *what it would look like* – physically and virtually (Issue 5).

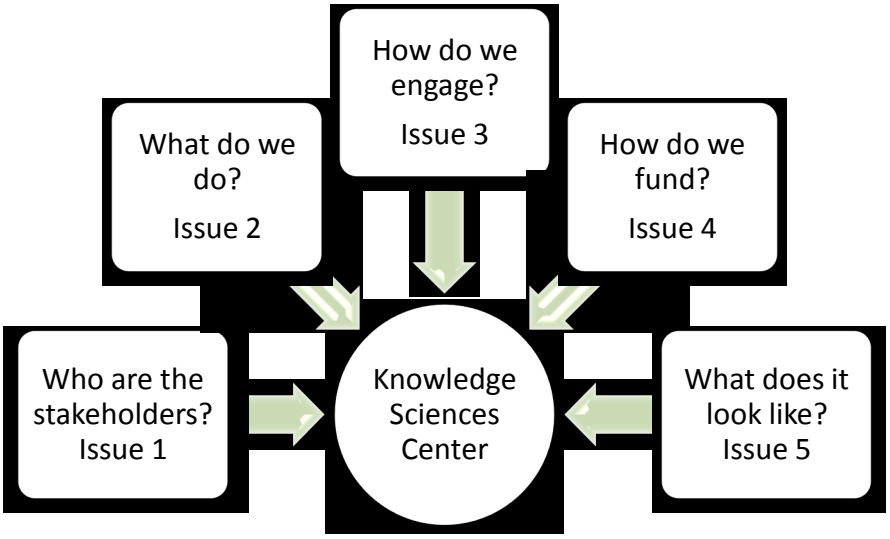

Figure 1: Knowledge Center Vision and Design – Five Key Issues

Issue 1: Who are the Participants in a Knowledge Sciences Center?

We began the discussion of stakeholders with an assumption that there were five primary interest groups, including academic, business, labor, civil society and technology developers. It quickly became obvious that these groups were neither comprehensive nor inclusive of possible stakeholders. We realized we needed to look at potential stakeholders from multiple perspectives. In the end, the Participants concluded that any member of the community that was being served by the Knowledge Sciences Center was a potential stakeholder, including but not limited to: academic, religious, and educational institutions, libraries, localized ownership, NGOs, governmental organizations – federal, state, local, county , academics, congressional staff, service organizations (boy scouts, girls scouts, youth groups, 501(3)c organizations, charitable organizations, military support organizations, professional societies, chambers of commerce, city visitors' bureaus, unions, local government agencies such as fire, police, emergency management, innovators in search of partners, elected government officials, and voluntary sector organizations. The list of participants clearly requires a different kind of organization than traditional institutes, science centers or think tanks.

Understanding stakeholders along a single dimension such as their economic role presented a risk, but understanding stakeholder interests and needs will be necessary for brainstorming the types of activities, products and services the Center should provide. As a first step, Participants suggested a Knowledge Sciences Center should prepare persona. Persona templates would help to understand stakeholders' goals, their different roles and responsibilities, their technology environment and skill levels, social media behaviors, and pain points. All of these dimensions are critical to planning activities, to designing access and supporting collaborative environments, to financing activities and to designing engagement models.

Issue 2: What Do We Do?

A core question for the blueprint is, "What does the Center do for these stakeholders?" We were fortunate to have more than 200 seasoned knowledge management professionals share their ideas on activities. We were also fortunate that this group had an implicit understanding of what we meant by knowledge sciences – its goals, its scope – and by what it means to practice knowledge management - its methods and tools. The participants proposed five areas of focus drawing upon their profound knowledge of the field and the challenges inherent to the transformation (Figure 2).

Figure 2: Business Capabilities of a Knowledge Sciences Center

The five broad areas were: (1) Learning and Career Development; (2) Research and Development; (3) Advocacy; (4) Advising; and (5) Networking and Partnerships. A significant portion of the in-person meetings in Ohio and Washington DC were devoted to brainstorming activities for these five areas. As shown in Tables 1-5, there was no shortage of ideas. Use cases are provided for each of the five activity areas to provide a deeper understanding of the value that such a Center might provide to the community.

Table 1: Learning and Development Activities

Activity Name	Brief Description
Center of Excellence Reference materials	Business Growth Maps, Case Studies, Lessons Learned/Smart Lessons, Information Repositories – Wikimedia Repositories for Other Hubs/Chapters, KM Body of Knowledge, KM Standards, Knowledge Visualizations, Open Repository or Wiki, Real Work Scenarios, Roadmaps, ROI Methods, Scalable Solutions, Standards Organizations, , KM Principles
Knowledge Sciences (KS) Learning Programs	MOOCS, ADDIE Model Training and Collaborative Workshops, Webinars, in House Training Programs for Organizations, Retraining Programs With Economic Development Units.
KS Book and Journal Clubs	Open Discussions of Recent Works to Help Promote Research Uptake
KS TV	KM Tedtalks, Open Webinars, KM Internet Travel Channel, Community of Practice Study Tours (Virtual and Physical)
Knowledge Sciences Learning Center	Certificate Programs, Competitions for Knowledge Games, Learning Games – Simulations, Pointers to Courses, Pointers to Programs, Transformation Learning Support
Knowledge Visitor Center	Orientation to the Knowledge Society and Knowledge Economy, KM Tourism, KM Concierge
KS FAQs	Basic Q&A for KM Novices, FAQs for Individual Topics, KM Study Guides
Student Internships and Practicum	Project and Internship Opportunities, Student Resumes and CVs, Matchup Projects and Industry Needs

For Learning and Development, we have identified three use cases that could be developed and launched with the support of academia, the business community and public sector agencies, technology vendors, and private citizens.

Use Case 1: Capture and Preservation of Knowledge Management Historical Grey Literature. Much of the body of knowledge supporting the discipline of knowledge management assumes the form of grey literature. Because of the fragility of grey literature, this means that much of the body of knowledge of knowledge management is at risk of disappearing. No single academic institution or publisher can take on the responsibility of assembling, digitizing, preserving and making it accessible. Research (Bedford 2015) tells us that there is a need to make the body of knowledge accessible through an open web search tool. Knowledge Sciences Center assembles a project team consisting of federal agencies who were at the helm of knowledge management in the 1990s, engages academia – students and faculty – to prepare a plan to identify and preserve key sources, identifies vendors to help digitize and semantically process the materials, and negotiates with commercial vendors to make sources searchable. The project team also puts in place a submission function which allows individuals to contribute their historical materials to the repository.

Use Case 2: Knowledge Audit and Knowledge Management Maturity Assessment Workshops. Knowledge management techniques are challenging to learn because there are few practical guidebooks, because workshops at conferences are expensive and few have resources to travel, and because many methods take more than a half-day or a full-day to learn. Knowledge Sciences Center works with practitioners and academics to craft low- or no-cost open workshops on key techniques, e.g. knowledge audits, knowledge management maturity modeling, knowledge capability modeling, knowledge network analysis, knowledge elicitation and representation, etc. The workshops are recorded and posted to YouTube, and materials are available for anyone to use. They can be used by local groups to organize learning events, or used for self-study purposes.

Use Case 3: KM Journal Discussion Clubs. There is a substantial body of high quality knowledge management research in the peer-reviewed journals. There are challenges, though, in accessing and interpreting the research due to the nature of scholarly writing and presentation standards. Because the field is application- rather than theory-focused, it is important to increase the uptake of current research. The Knowledge Sciences Center will sponsor monthly "Research Clubs". These clubs will function like book clubs. Each month, an article from a peer-reviewed journal will be selected by the group for discussion in an interactive webinar. The author will be invited to join the online discussion. The author has an opportunity to explain the value of the research, to extend the impact of the reach in practical ways, and the discussants have an opportunity to gain a better understanding of the research. The expectation is that the discussions will lead to further applications of the research and to new research projects.

Table 2: Research and Development Activities

Activity Name	Brief Description
KS Experimental Test Lab and Incubator	Access to Smart Knowledge Systems, Technology Transfer Facilitation and Adoption, Novel Approaches to Licensing Or Purchasing Tools for Groups Or Communities, Guidebooks for Scalable and Right-Sized Solutions, Technology Transfer Opportunities, Identification of Reasonably Priced Platforms for Small and Medium Sized Organizations, Evaluate Products for Vendors, Focus Group Testing for Vendors, Open Source Software Development for Knowledge Sciences Community – in Collaboration With Other Disciplines
Knowledge Sciences Collaborative Research & Development	Collect Research Needs Ideas , Creation of Use Cases and Case Studies, Enterprise Scalable Solutions, Interoperable Solutions, New Approaches to Translation and Interpretation of Regulations, Policies and Standards, Provide Real World Problems for The Center to Work On, Research Agenda, Research Needs Statements, Standards and Guidelines for Findability
Knowledge Sciences Information Access Improvement	Knowledge Sciences Languages, Knowledge Sciences Organization Systems (e.g., Classification Schemes, Thesauri, Authoritative Lists)
Knowledge Challenge Workshops and Projects	Global Expert Teams, Special Topics, Wicked Problem Teams
Knowledge Elicitation Lab	Knowledge Elicitation Training, Knowledge Loss Prevention and Capture Strategies
General Research & Development	Assess Research Capabilities, Benchmarking Opportunities, Knowledge Cities Index, Knowledge Economy Models, Knowledge Society Behavior Codes and Ethics, Project Assessments, KM Research Agendas, Innovation Research
Knowledge Economy Future State Visions	Economic Sector Scans, Industry Scans
Knowledge Sciences Research for Economic Sectors and Industries	Knowledge Society Futures. Knowledge Futures for Specific Organizations

For Research and Development, we have identified three use cases that be considered for the initial roll out of a knowledge Sciences center.

Use Case 4: Small and Medium Sized Business Consortium Services. A key business capability or the knowledge economy is semantic management of an organization's knowledge and information assets. Small and medium sized businesses cannot afford these services, which often cost more than their annual operating budgets. They also cannot afford the expertise that it takes to sustain these technologies. Because the semantic technologies are expensive to develop and sustain, there needs to be a large market for vendors to survive. The market is currently limited due to lack of knowledge and skills to implement the technologies. The Knowledge Sciences Center can bring students and faculty together with vendors to provide affordable services in a consortium environment. This allows software vendors to expand their market for semantic products and services. Through the consortium, the academy is creating a cadre of trained semantic engineers to help business implement the solution.

Use Case 5: KM Access Tool Development and Adoption. Knowledge management is a cross-disciplinary field. Finding the literature of the field is challenging because commercial databases and web search tools do not support KM-specific discovery. There is a lack of knowledge organization tools specific to the KM discipline. The Knowledge Sciences Center can draw upon the skills of the academy to draft discovery tools. The Center can provide a context for deployment and testing of the tools by stakeholders across all sectors. Once developed, the discovery tools can be given to commercial database producers and libraries to use in their search systems.

Use Case 6: Knowledge Elicitation Training Courses. With the Silver Tsunami – the mass retirement of the Baby Boomer generation – upon us, there is a need for effective and efficient methods of knowledge elicitation and representation. There are many books on the subject, but there are few methods that have been proven to work for organizations. The Knowledge Sciences Center can engage with those experts who have developed effective methods to extend their reach across sectors. The Center can engage with experts and academics to transform methodologies into training materials. By training students in effective methods, the Center increases capacity across the field, and makes it possible for organizations to mitigate knowledge loss.

Table 3: Advocacy Activities

Activity Name	Activity Examples
Active Engagement with Knowledge Economy Transformation	Adaptive Society Change Information Technologies, Innovation to Gain Market Share, Libraries Coached to Communicate Knowledge Management in Real-World Terms
Executive marketing and communication about KM	Knowledge Sharing Workshops, Lessons Learned Engaging With Corporate Executives
KM Competencies	Cost Reducing Solutions, Early Maturity Needs, Efficient and Effective Solutions , Facilitation Services, Larger Strategic Perspective , Problem Solving Approaches That Leverage KM, Standards Graphs Showing ROI
Sponsorship and Representation at Major Conferences and Social Activities	Marketing Center for All Things KM, Ability to Integrate with Other Domains, Providing Opportunities for Professionals to Socialize and Exchange Ideas
Development of KM Legal and Ethical Codes	Advocacy With Professional Societies, Collaboration With Human Capital and Human Resource Management
KM Standards Development and Promotion	Establish Committees to Define Standards for KM Professionals, Develop Standards for KM Professionals, Assess the Validity for Standards for KM Professionals, Disseminate Standards for KM Professions
Promotion of KM at all levels of education	Criteria for Teaching and Selection, Subversive Missions - Influencing Education and R&D, Gaming and Simulation, Education Technology, Cognitive Sciences, Lifelong Learning, Communications
Promotion of KM Project Opportunities	Receiving and Broadcasting Knowledge Management Projects Throughout the KSC Network, Promoting Stakeholder Capabilities
Promotion of Open Access KM Journals	Working with Publishers to Develop Pricing Models That Support Broad Access to Knowledge Management Research and Development, Case Studies and Thought Papers, Develop Online Open Access Journals and Trade Publications to Promote Stakeholder Knowledge and Learning.
Knowledge Management Industry Awards	KM Awards and Recognition of Leading Organizations and Individuals

Advocacy is another critical capability for the field. A Knowledge Sciences Center could play an important role in advocacy for the field and also for a local knowledge community. .

Use Case 7: KM Standards Development. In order for the field to achieve the level of a professional discipline, there must be a set of professional competencies for individuals, standards for coverage of knowledge management education programs, and guidelines for operationalizing knowledge management in organizations. This is a challenge in a field which has such a broad reach. Knowledge Sciences Centers – acting in a network structure across the country – can provide the advocacy and support for this effort. The role of the Center is one of convening and mobilization, and advocacy across sectors.

Use Case 8: Promotion and Adoption of KM Education Across Levels. At the present time, knowledge management education and training is focused on graduate level programs or advanced certificates. A general education base for knowledge management is missing across the field. Developing knowledge management education programs below the graduate level will take a considerable mobilization and advocacy effort. Knowledge Sciences Centers can engage educators, curriculum developers, artists, and trainers to engage in the creation of materials which will support the introduction of knowledge management at the primary and secondary school levels.

Use Case 9: Local Knowledge Notes. Knowledge management is an application-focused discipline. It is important that knowledge management methods be accessible to local businesses. At the same time it is important that local solutions and practices be promoted to the larger discipline. There is a need to communicate about knowledge management efforts at the local level. Local businesses may not have the capacity to report on their progress to the peer-reviewed press. A local Knowledge Sciences Center could provide a local reporting and publishing capability – Local Knowledge Notes – that would create a vibrant dialogue around knowledge management activities. Local high school students, undergraduates, and graduate students could develop and publish stories.

Table 4: Outreach and Partnership

Activity Name	Brief Description
Annual KM Surveys	Understand Stakeholder Needs, Local and Networked Resources
Consulting and Advising	Establish Requirements, Create "People Finder" (e.g., through LinkedIn), Differentiate Types of Consulting the Center Does / Pilots, Develop a Methodology for Matching Stakeholders with Expertise for Consulting Purposes / Services, Identify Tools Repository
Development and Collection of Metrics and Stories	Performance Plan Examples, Price Points, Provide Strategic Maps and Assistance to Cities and Towns
Funding proposals and opportunities	Crowdsourced Solutions, Crowdsourced Funding for KM Research Needs, Short Term Services
Knowledge Management Mentorships	Mentoring Across Organizations, Mentoring Across Ages
Open Virtual Laboratory	Learning Management System, Sandbox Tool – Simulators, Prototypes, "Authoritative" Tools, Customer Relation System, Profile, Access Rights, Track & Trend Analysis, Library of Access to Authoritative KM Content, Ontologies, Analysis, Blogs, Social Media Presence, Tool "Reviews"/ Recommendations

Outreach and Partnerships are the core activities of a Knowledge Sciences Center. It is through partnerships that the Center undertakes activities. Outreach is a critical function that helps to grow the discipline and to also spur the growth of the local knowledge economy and society.

Use Case 10: State of the Discipline Surveys. Knowledge management suffers from a lack of routine, periodic and repeated assessments of the state of the field. Such surveys are generally undertaken by practicing professionals or professional associations. Because there is not a single discipline-wide professional association, we lack a good survey base. Knowledge Sciences Centers – working together across the country – will have a strong sense of the surveys that are needed, the base to be surveyed, and the interventions and projects that would follow the surveys. Eventually, a professional association might evolve from the collaborative efforts of knowledge science centers.

Use Case 11: Clearinghouse for KM Opportunities and Expertise. It is challenging to find and evaluate sources of knowledge management expertise. It is also challenging to find opportunities for new professionals to grow their expertise and build their portfolio. Local Knowledge Sciences Centers can act as clearinghouses for opportunities and expertise. Opportunities may include consulting contracts, new position advertisements, student course projects, as well as general directories of knowledge management expertise.

Table 5: Advising Activities

Activity Name	Activity Examples
Broadcasting KS Activities	"News" Source for Innovative KM Practices, KM Blogs, Investigative Reporting, Electronic Calendar of Global KM Events
Networking and Public Outreach	Community Networking, Linking Consultants and Clients, Affinity Grouping within and across Sectors, Networking across City Organizations, Links From Citizens to Thought Leaders, Knowledge Connectors – Linking Those with Problems and Those with Solutions, Knowledge Practitioners Directory
Open Meetings Spaces	Experiments, Brainstorming Sessions, Knowledge Jams,
Outreach to Other Disciplines and Economic Sectors	Partnership Outreach and Extension Service
Social Media Support for Dynamic Conversations	Links to Twitter Feeds Related to Knowledge Sciences

The field of knowledge management is rich with consulting and advisory services. Many of these services, though, lack a cohesive community from which to draw and to which to offer their services. The Knowledge Sciences Center can help to fill this gap.

Use Case 12: Local Calendar of KM Activities. As the level of knowledge management activity grows in response to the efforts of the Knowledge Sciences Center, there will be a need to identify and promote a local KM calendar of events. The local Knowledge Sciences Center would be a good resource to maintain such an event calendar. The Center could

also promote national and international KM activities through the calendar to ensure the local community is connected to the broader community.

Use Case 13: Local Communities of Practice. The need for knowledge sharing and brainstorming increases as knowledge management practices grow in a city or a local economy. Sponsoring knowledge conversations or a local community of practice can be a heavy burden for a single organization. A local Knowledge Sciences Center can act as a catalyst for these conversations either by arranging to host lunch meetings or informal gatherings, or by managing the logistics and communication for the group. A local community of practice can also provide opportunities for students and faculty to engage in the conversation.

The list serves as a catalog of opportunities for any group that wishes to take up the challenge of building a Knowledge Sciences Center. It serves as a tool for prioritizing and implementing activities as relationships with stakeholders develop. Clearly, there are variations in cost, value, duration and sustainability, and lead times. The significant number of activities recommended reinforces both the need for and the lack of existing support provided by current players. It is clear that no one organization or institution can fulfill all of these needs. Only through working in a consortium or cooperative environment can a Knowledge Sciences Center meet these needs. Different activities and stakeholders also mean different engagement models.

Issue 3: How Do We Engage?

The Center's engagement strategy is complex. Multiple engagement models would be required because different kinds of activities require different ways of working. Multiple models are needed because stakeholders' interests, environments and resources vary. Participants discussed five possible engagement models, including: (1) Traditional academic R&D model; (2) Agricultural extension service model; (3) Knowledge services corps model similar to that of the Peace Corps; (4) Consortium model; and (5) Business franchise model.

The first envisioned model would support applied research that is needed by the community or for which there is no other logical source. This engagement model looks like a traditional academic science center where knowledge resides in the center and is channeled out to the community. Such a model assumes there would be formal contracts in place with funding agencies or organizations, and that all research standards, records and protocols would need to be maintained. In order to support research, access to library resources is also required. The Center would have to work with the university or college to contract for access.

The second envisioned model resembles that of an agricultural extension service. This model would support the development of solutions needed by the community, the non-formal learning needs of the community, and technology transfer issues. In this model the Center uses visits to stakeholders as a way of staying in touch with the needs of the local community, gather input to policy formulation, and provide targeted client advice. This engagement model would be a good fit for Learning and Career Development, and Advising activities.

The third envisioned model resembles a Knowledge Services Corps – similar to a missionary model or Peace Corps structures where knowledge evangelists engage directly with the community to foster conversations and knowledge transactions while leveraging the Center's infrastructure and resources. This engagement model might leverage graduate students, students fulfilling practicum or internship requirements, who were supported by community scholarships, or volunteers earning community service or continuing education credits. This model would align well with Outreach and Partnership activities.

The fourth envisioned model resembles that of a consortium where the Center acts as a cooperative partner with other universities, institutions, and agencies to support activities. This model supports activities that require or benefit from a collaborative environment. This engagement model would be a good fit for Advocacy activities, where the Center would partner with other organizations to move initiatives and standards forward on behalf of the larger community.

And a fifth envisioned model – business franchise – was suggested. This was a particularly interesting model because it would allow the Center to reach out into the community through a hub-spoke model, and because it would provide conceptual buy-in and ownership relationships. "Franchise owners" at local libraries or universities or agencies would provide space or connectivity through which stakeholders could engage with the Center.

Each of the use cases discussed earlier would leverage one or more of these engagement models. It is important for a Knowledge Sciences Center to have multiple models from which to draw and design engagements.

Issue 4: How Do We Fund the Center?

As a Knowledge Sciences Center our goal would be to mobilize and promote ideas. As with any such venture, funding will be necessary for sustained effect. Participants were asked to consider what kind of an innovative funding model would support Learning and Career Development, Research and Development, Advocacy, Advising and Networking. The answer to this question was similar to other answers – multi-faceted, dynamic and flexible. Funding models – as engagement models – must be relevant to the activity and to the stakeholders. Learning and Career Development activities may leverage a variety of funding models ranging from entirely open source contributed courses accessible on MOOCs, to no-fee open webinars, to fee-based workshops and on-site training courses, to formal certification or testing services. Advocacy activities would leverage in kind resources, community grants, crowd-funding, or direct sponsorship.

Research and Development may be funded through grants, research funding awards, and joint sponsored funding. Research may also be supported by in-kind contributions of the members of global expert teams. The model will depend on the nature and intensity of the research. R&D projects that support technology development or evaluation may be sponsored by technology vendors or venture capitalists. Research that has a direct community application may be funded through crowd-sourced or in-kind contributions. The nature of the funding must also take into consideration the intellectual property rights of the products and services. In some cases, established intellectual property provisions will apply. In other cases, creative commons and open source models might be more appropriate.

Another funding model would be pay-for-service. This may be appropriate for Advising activities. Again, there would need to be a progressive pricing strategy to ensure that all members of the community can afford to participate in these activities. The lowest pricing option should be an in-kind contribution or a barter system. In-kind contributions strengthen the Center by increasing its stock of knowledge. Where the Center might support in-kind contributions or contributed services, it would be necessary for stakeholders to have access, and the Center to support the idea of a "knowledge bank". The idea would be that as stakeholders contribute to the Center, they earn intellectual credit that can be applied to future requests.

Also proposed was a fee-based membership model.. The challenge with membership models, though, is that they lock and organization into providing predictable and pre-defined services to members. This typically leads to the need to define generic products and services rather than on-demand or stakeholder-focused activities. We have observed that institutions based on memberships over time can become bogged down in the administrative tasks of supporting members. The membership model might also price many community members out of most engagements. The Participants thought that a membership model should be considered only after all other options had been explored.

In addition, to having a stock set of funding models, the Center would need to have a robust list of funding sources and opportunities. On-going fundraising relevant to current or planned engagements would be one of the Center's major operations.

Another more revolutionary approach would be to maintain a "knowledge bank" of deposits and withdrawals among Knowledge Sciences Center participants. Such contributions may take the form of in-kind contributions or effort, no- or low-cost advising or simple knowledge sharing. We would expect a healthy Knowledge Sciences Center to generate a high level of activity, not all of which would needed to have a financial basis.

Issue 5: What Does the Center Look Like?

The Participants were of one mind in recommending both a virtual and a physical preference. The sentiment was that the physical presence should be minimalist and networked to increase visibility.

The physical space should ideally be located on a university or college campus to ensure there is easy access to faculty and students, as well as to research protocol support. However, participants suggested that a remote or satellite campus might be more appropriate to ensure that the Center can establish its own innovation-oriented, dynamic and community-focused organizational culture. The nature of the space should be open, heavily technology-enabled, with spaces for stakeholders to meet and work. The physical space should feel like an open knowledge sharing

environment. As the Center grows, there may be a need for spaces for visiting scholars or short-term team work spaces.

Depending on the nature of the stakeholders, their competencies and environments, the physical Center may need to provide access to the Center's virtual space. We would also expect "Center franchisees" to provide community-based access to the Center. The Center's virtual structure includes online collaboration environments, access to social media and cloud-based repositories. The Center is also virtually linked to other similar-Centers. The Center's virtual presence might leverage cutting edge technologies under development or testing by technology developers or vendors.

The heavy reliance on virtual access would present both challenges and opportunities. In terms of challenges we would expect that many stakeholders would not have affordable high-bandwidth access. We also expect that digital literacy rates might be low for some stakeholders. This presents opportunities, though, for coaching and mentorships particularly where students and community members contribute training time in exchange for other services.

2. The Blueprint

The participants generated a wealth of ideas and options. While a number of support activities might be consistently supported through stable funding sources, it is clear that many will be 'designer-oriented'. In other words, a stakeholder engagement and funding design model might need to be put in place for each activity. This is not the way that most organizations work. Thus, the participants agreed that an engagement design model would need to be developed for the Center.

The model favored by the participants was an emergent engagement design (Figure 3). The design process would begin with a proposed activity. To ensure that the Center stays true to its goal of facilitating the community or local area's transition to a knowledge economy, deployment needs to be carefully managed and aligned with demand. The Center would put in place the virtual infrastructure, and engage stakeholders in activities that required low investments but could demonstrate high value. As value is recognized and promoted, stakeholder engagements would expand and build the Center's reputation.

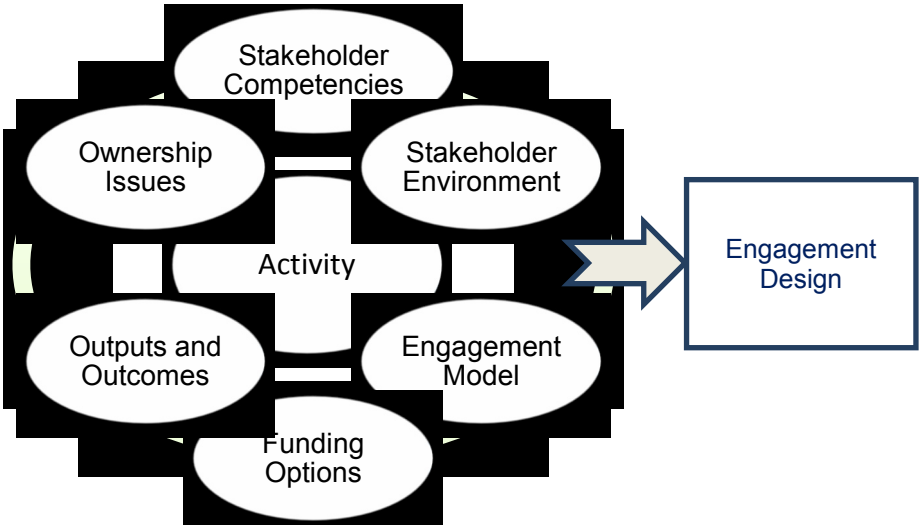

Figure 3. Knowledge Center Activities

2.1 Observations and Next Steps

The purpose of sharing these ideas is to encourage communities around the world to consider starting a Knowledge Sciences Center. At the time this article is going to press, there are three Knowledge Sciences Centers in design stage. Two of these are on the East Coast, and one is in the Midwest. Each Center will have a different focus and will launch with a different set of engagements. Each is taking an effective approach in reflecting the interests of the local community. The intent of a Knowledge Sciences Center is to serve the local community, and act as a connection point for stakeholders in the community. Some Centers will anchor with an existing research institute, and grow into the community. Others will begin by partnering with local foundations and will develop connections to local universities over time.

It is clear from these recent initiatives that five issues are core to successful implementation of the Center, and to each individual initiative. It is also clear that there is no one-size fits all strategy for building out the Knowledge Sciences Center. A successful Knowledge Sciences Center is interactive, problem-focused, trans-disciplinary, and community-based. Another lesson that has been learned through these young initiatives is the importance of a facilitator or leader with a robust and broad understanding of the field. Finding a transformational leader with the behavioral competencies, dedication and creative spirit to bridge diverse communities is key to its success. The long-term success of the Center is dependent upon the continued engagement of and value to the local community.

It is the intent of the research team to share these ideas, the blueprint, and information on current initiatives to encourage others to consider establishing Knowledge Sciences Centers for their local communities. The research team is open to sharing ideas and knowledge gained with any knowledge management practitioners.

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