A KNOWLEDGE MANAGEMENT SYSTEMS FRAMEWORK TO SUPPORT A TECHNOLOGY COMMERCIALIZATION – FRIENDLY ENVIRONMENT

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ABSTRACT

Improving economic development by stimulating technology commercialization (TC) is a goal of many governments, private foundations and some national laboratories and universities. The wide range of policies, activities, and grants stimulating TC in national laboratories, universities, and the commercial sector are frequently knowledge-laden processes. Therefore, appropriate knowledge management (KM) tools should be utilized to maximize effectiveness and efficiency of these processes. This research provides a framework that aligns early stage technology commercialization activities with specialized knowledge management systems. This framework allows the identification of gaps where TC activities are not supported by KM systems.

INTRODUCTION

A recent state publication recommended funding the design of a database of intellectual property available from regional universities and national laboratories. It is hoped that an existing application serving the same purpose, Flintbox, would be reviewed before designing a new information system to accomplish essentially the same thing. The research in this paper describes information systems which support early stage TC activities, so that those information systems can emulated, utilized, or improved upon. By arranging these systems in a framework, it can also be seen where there are gaps – TC activities that are yet to be supported with appropriate information systems.

This paper particularly focuses on those ambiguous early stage activities related to creating a TC-friendly regional environment. A region might be a state, a nation, the European Union, a county, or some other bounded area. The following activities were identified by the Washington Economic Development Commission [4, p. 8] as essential to commercializing technology developed in regional research institutions. They have been paraphrased here, and could be relevant for any region.
- Increase awareness and understanding of the region's unique TC dynamics with researchers, inventors, business leaders, elected officials and the general public.
- Expand the amount of funding available at the early stages of an innovation-based enterprise and improve access to capital and other funding sources.
- Create a commercialization-friendly environment in the region by improving access to information and decreasing adverse policy and regulatory issues.
- Promote research and commercialization collaboration within and among our research institutions as well as between the public and private sector partners within the region.
- Expand the region's infrastructure to support technology commercialization and innovation.

KNOWLEDGE MANAGEMENT SYSTEM CAPABILITIES

KM systems designed to support TC are of particular interest in this paper, as it can seen that activities such as those listed above are knowledge-laden [2]. KM has been defined in many ways, but this paper utilizes a set of KM system components provided by the Federal Enterprise Architecture program [3, p.

48-49], as those components relate particularly well to the activities of the technology commercialization (TC) process.   These components form the y-axis in Table 1.

KNOWLEDGE MANAGEMENT SYSTEMS (KMS) THAT SUPPORT TC

KMS that have been designed or tailored to support early stage TC activities are described below. These systems have been developed for use in various environments, and this is undoubtedly an incomplete list of all the systems which are available for supporting TC.

1) Regional and Industry websites
   - The Economic Development Office at Pacific Northwest National Laboratory -- http://www.pnl.gov/edo
   - The Washington Biotechnology and Biomedical Association --www.wabio.com/
2) Database of rurality issues -- www.ibrc.indiana.edu/innovation/data.html
3) Information visualization software -- infoviz.pnl.gov/
4) Geographic Information Systems software
5) Flintbox online application -- www.flintbox.com/
6) TurboNegotiator expert system -- uidp.org/UIDP_TNWorkingGroup.html
7) CREST Collaboration Decision Guide -- ec.europa.eu/invest-in-research/policy/crest_cross_en.htm

AN INFORMATION SYSTEMS PLAN

Information systems planning ensures that enterprise goals are supported by appropriate information systems, and matrices are a common planning tool [1]. In this paper, instead of focusing on the goals of an enterprise, the focus is on the goals of a region trying to stimulate TC. A matrix is used here to match KMS to TC objectives to see how well TC objectives are being supported, and where systems are needed.

In Table 1, the activities which support the creation of a TC friendly environment are on the x-axis. Functions of knowledge management systems are on the y-axis. In the cells are numbers representing KM systems (listed in the section above) which support the TC activity with the corresponding KM feature.

DISCUSSION

From the framework it can be seen that there are systems to support information sharing and retrieval, as well as improving access to information for many TC activities. This is not surprising, as websites and databases are easily implemented. In addition to the websites and databases, Flintbox, TurboNegotiator, and CREST decision tree also provide access to information, as well as supporting collaboration, particularly between holders of intellectual property (IP) and businesses interested in developing that IP. The visualization tools are knowledge discovery tools, in that they help find research synergies which were not previously recognized. Flintbox utilizes Smart documents, in that the knowledge about collaborative research agreements is contained within the software, and the system guides the users through the process of reaching an agreement.

Some columns and rows where there are few or no KM systems provoke interest. It seems like the complex arena of intellectual property could benefit from a system to support information mapping and taxonomy creation.

CONCLUSIONS

Rather than reinvent the wheel by recreating such systems, entities interested in fostering technology commercialization (TC) may choose to emulate, utilize, or improve upon existing information systems. Filling in the blank areas in this framework with new knowledge management systems (KMS) designed to support some aspect of the TC process will be a significant service.

TABLE 1: KMS Framework to Support a TC – Friendly Environment

TC Activities / KM Function	Increase awareness of TC dynamics	Expand funding	Improve access to information	Promote collaboration	Expand infrastructure
Categorization			IP tool-5		
Information mapping/taxonomy					
Information retrieval	Websites-1 Databases-2	Websites-1 Databases-2	IP tool-5 Websites-1 Databases-2	IP tool- 5 Expert systems-6, 7	Websites-1 Databases-2
Information sharing	Websites-1 Databases-2	Websites-1 Databases-2	IP tool-5 Websites-1 Databases-2	IP tool-5	Websites-1 Databases-2
Knowledge capture					
Knowledge discovery	Visualization-3 GIS-4			Visualization-3 GIS-4	
Knowledge distribution & delivery					
Knowledge engineering			Expert systems-6,7	Expert systems-6, 7	
Smart documents			IP tool-5	IP tool-5	

REFERENCES

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