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UNIVERSITY TECHNOLOGY & ECONOMIC DEVELOPMENT
The URC: A Proposed Model for Innovation and IP Capital Deployment

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ABSTRACT

This paper describes an organizational model – the University Research Corporation (URC) - that would serve to expedite the development and deployment of technology in alignment with the mission of a college or university that conducts research. Three major areas for the proposed organization – Structure, Intellectual Property, and Economic Development – are described that employ any or all of three types of partners anticipated for the URC, namely academic, governmental and industrial.

Keywords: *Technology Management, Technology Strategy, Technology Transfer, University Research*

1. INTRODUCTION

1. University Research Corporations (or Institutes) (URC's)

Over 100 universities in the US have established a separate entity for managing university research projects under contract, the entity being usually a 501 (c) (3) non-profit corporation, whose Board of Directors (or Trustees) is composed mostly of university officials and outsiders whose appointments are originated by some university official, usually the President or Chancellor. The research work being conducted by university faculty and students at URC's is mainly funded by governmental agencies with a minor amount (the average is about 7%) being sponsored by commercial or industrial firms. The founding of some URC tech transfer offices date back many years (Stanford – 1970 (Office of Technology Licensing), Columbia – 1982 (Science and Technology Ventures), Georgia Tech – 1975 (Georgia Tech Research Corporation). Many URC's were established to expedite contracts, procurements, and external funding for faculty consulting and student employment. In addition, the URC provided some indemnification for the university from the obvious commercial work being conducted there as well. Net income from the URC is usually plowed back into a university foundation for funding further research or for providing scholarship money to students. In addition, The URC acts as the steward of university intellectual property including trademarks, copyrights, trade secrets and patents. The latter function allows the URC more flexibility in negotiating right-to-use agreements, royalty payments, and limited employment contracts with researchers, students and support personnel without going through university administrative channels. Since the URC can subcontract out work to commercial and industrial firms as well as utilize faculty and graduate students under contract, it can mobilize resources in rapid fashion in order to respond to any contract need as well as in assembling a proposal for a solicitation.

Under the Bayh-Dole Act of 1980, (see US Patent Publication L, No. 96-517) universities have been given ownership of the intellectual property generated from research performed with funds from both federal and private sources.(Salazar & Kumar, 2004) (Siepman, 2004) Although universities have been only modestly successful in tech transfer since Bayh-Dole, this sector has the largest number of organizations that specialize in research contract work and accompanying tech transfer activities.

2. URC Organizational Structure

The main functions performed by a URC are project oversight, financial administration, IP management and economic development. Hence, its organizational structure reflects these functions by having directors charged with their management responsibility. The aim is to keep the overhead expenses low and subcontract out as much of the work as possible. Contract bids by URC's are made with standardized personnel costing models and expense allowances so that over-runs are kept to a minimum. Further, financial oversight is centralized so that cost comparisons can be made easily and duplicate work eliminated.

In some cases, URC's have their own facilities apart from those managed by university departments. This allows the URC to integrate work being conducted by researchers from different departments and prevents disruption of the teaching and laboratory equipment and facilities of those departments. Also,

should a project be classified or top secret, by having its own facilities, the URC is able to control access to documentation and equipment associated with that project.

Human resource management in the URC can be tailored to contract work so that personnel movement in and out of URC does not have to comply with university personnel policies which are largely influenced by unionized labor groups.

A board of trustees, according to corporation law, is charged with financial and policy oversight of the URC operation. Regular meetings of the board (at least quarterly) ensure that URC operations run smoothly and with minimal disruption of adjacent university operations.

3. Setting Up the URC – A Structural Model

Following is a summary of general recommendations and conclusions for setting up a URC.

1) The URC should be established as a non-profit 501 c (3) corporation with no shareholders and no capital stock. The composition of the Board of Directors (or trustees) that manages the affairs of URC should be one third from industry, one third from academia and one third reserved for independent directors with no ties to academia and no ties to the industrial partners engaged in work for URC. Reserves should be set up by URC for an investment fund to be used for assisting the process of commercializing technology. The fund can invest in start-ups or spin-off companies as well as take an equity stake instead of (or as a supplement to) royalty payments for the technology being transferred from the URC.

2) The mission and primary objectives of the URC is to provide the highest quality technology research and development services under contract to government agencies of which DOE, DARPA, NOREL, are examples. One of the drivers for the establishment of URC is to increase the efficiency and speed by which technology enhances the region's, the state's and the nation's energy independence, security and efficiency through state-of-art applied research, testing and consulting services. The URC organizational by-laws should reflect the mission, operational structure and management dedicated to achieving this or similar goals.

3) The categories of partners engaged in the work of URC are expected to be private industrial firms, government-sponsored laboratories and public and private universities.(Etzkowitz & Leydesdorff, (1998) (Leydesdorff & Etzkowitz, 1998) (Berneman, 2003) The contributions realized by integrating the work from these sources of research and technology can far exceed that from any one source. Although government agencies are normally prohibited from becoming URC trustees, they will be affiliated parties in that many contracts will be issued by them. Each category of partner brings human resources, management, knowledge and know-how and researchers to the demands of fulfilling contract requirements.

4) Possibly the most important resource function to be developed at the URC is *project management*. This function allows a project or program with contributors from various URC partners to be set up with appropriate human resources, equipment and tools, a project schedule and budget, and reporting mechanisms so that mission objectives can be accomplished with efficiency and accountability.

5) URC should strive to have as much research and development work done at its own facilities for three reasons. First, work of a proprietary nature is more easily conducted in a single facility rather than at several. Second, the integration of resources from academic, governmental and industrial sectors is more easily done at a single facility. Proximity of collaborators, equipment and management can only aid the progress of work at hand. Third, ownership of IP is more easily claimed by URC if the work culminating in an innovation is done at its own facility. This factor is especially important when the work involves university researchers since their employers tend to claim some form of IP ownership rights when any work is done at university affiliated facilities.

4. Managing the University Intellectual Property

American universities have generally been adamant about retaining ownership of intellectual property created by faculty and students even when the research being conducted is not federally funded. This is usually the case if university facilities, equipment and other resources were used in the work. In the case where funding agencies have provided the facilities, equipment and support staff apart from the campus, universities have generally had a "don't ask, don't tell" policy with the IP created under those circumstances. Private firms have used these conditions to retain all rights to the IP created. Even if campus resources are used for the research, U.S. universities are generally willing to give industry

partners an exclusive licensing option built into sponsored research agreements although they still retain title to the IP.

However, there are a few universities where title of intellectual property vests in the inventors when the research is not federally funded. An example is the University of Wisconsin which possibly has the most liberal of IP policies among US universities. Unless there are specific restrictions from the funding agency, that university turns over complete control of the intellectual property to the researchers. Its URC is the Wisconsin Alumni Research Foundation (WARF), a non-profit organization founded in 1925, in charge of the university IP. Its policy is that it will represent the IP created by faculty and students but they must assign their intellectual property rights over to WARF. In more cases than not, the inventors have chosen to work with WARF despite having to relinquish their rights to the IP.

American universities use URC's to handle their intellectual property through a tech transfer (TT) office. Since the purpose of the TT office is to generate royalty income, the nature of licensing transactions almost always necessitates proof of ownership of technology, namely a US patent. The deeper and broader the "coverage" in the patent claims, the more valuable it can be for the licensee. However, if the technology is in a "raw" form that will require substantially more development and testing before it can be commercialized, the less valuable it can be for the licensee. A few universities have generated enviable income from their patents but most tech transfer offices at URC's are simply cost centers, namely having more expenses than income. The statistics, although skewed by the few successful universities, indicate that tech transfer at universities is worth supporting for economic development reasons. (AUTM, 1999) Indeed, the private sector does view universities as serious research partners that can generate valuable innovations. In addition, start-up companies based around university intellectual property have helped the nation's effort to create new businesses. Incentives presented to faculty and students to generate more IP have generally produced higher returns for universities. (Lach & Schankerman, 2003)

Continuing the set of recommendations for setting up a URC, following are some that are specific to intellectual property.

- 1) URC policies should be put into place whereby funding agents cede intellectual property rights to URC but intellectual property (IP) policies at URC provide the funding agency and all URC partners involved full access to technology developments through non-exclusive licensing arrangements. Sublicensing by any URC partner to a third party is subject to a joint agreement in which the Board of Trustees agree that the sublicense is in the best interests of URC. IP developed at URC should be managed to maximize its value through tech transfer that includes licensing arrangements and encouraging start-ups that will commercialize the technology to the financial benefit of URC. Licensing compensation to URC can occur through cash payments as well as equity participation with the licensing party.
- 2) Tech transfer at URC will occur on an ongoing basis since academic and industry partners are expected to work on projects on a collaborative and integrative basis. Each partner will be expected to require access to technology developed on a joint basis in order to complete assigned projects on an unconstrained basis. The tech transfer policies at URC will supersede any intellectual property rules, guidelines and regulations of any partner's organization.
- 3) Significant incentives for researchers to participate in the generation of intellectual property and subsequent technology transfer should be built into the URC intellectual property policy. These incentives serve to protect the technology developed under URC contracts from infringement claims by third parties. For example, evaluation of projects can be made partly on the basis of the number and coverage of patents created from the project.
- 4) Technology developed by the URC and protected by patents should be reviewed by investors such as angel groups or venture capital firms so that further development of the technology can sometimes be funded by parties other than URC. Such development extensions will serve to broaden the base of technology available to URC and government agencies.
- 5) URC should make available a tech transfer officer, perhaps under contract to URC, who can assess the value of the inventions and discoveries disclosed during the execution of contracts funded by URC. The officer can recommend next steps for patent filing and claim coverage.
- 6) Researchers at URC should receive formal training in the different stages of the patent process and tech transfer. This training should include disclosure documentation and claim coverage for the patent filing process.

5. Workforce and Regional Economic Development

The public university has frequently been expected to act as a catalyst in regional economic development. (Nelson, 1996), (Arnold & Kuusisto, 2002) (Jamison & Jansen, 2001) With a URC in place the public university can rely on the job creation possibilities from start-ups that take advantage of the URC's intellectual property. (Salazar, 2006) The public university's URC is then seen as a fount of innovation to the regional population. By exploiting the URC's IP regional wealth creation results by having college graduates and faculty initiate and grow business opportunities that lead to higher levels of exports and higher per capita income for the residents that support the public university.

Following are some recommendations for setting up the URC that would embed economic development principles in the URC bylaws.

- 1) University partners can supply professors, researchers and undergraduate and student interns to work on URC projects. This action enhances a workforce pipeline for future URC projects and possible employment at governmental agencies and laboratories and at industry partners.
- 2) Industry partners are expected to supply to URC projects their management expertise, manufacturing and product testing resources when appropriate.
- 3) Intellectual property developed at URC can be used to seed start-up companies in terms of innovative products and services for commercial or governmental applications. URC management of intellectual property and accompanying policies applicable to all URC partners can encourage the commercialization of technology process.
- 4) Venture capital and angel investors should be encouraged to invest in start-ups who declare commitment to commercialize technology developed by URC. The preparation for the presentation to the investor group can be handled by the tech transfer office under contract to URC.

6. SUMMARY

With few exceptions universities that have set up URCs have found them to be cost centers rather than profit making enterprises. (Salazar, 2008) However, the URC model organizes the important elements, especially for the public university, of innovation through IP creation and regional economic development. Now, more than ever, the national economy is critically dependent on its global competitiveness that can only be established and maintained through an aggregated investment of creative efforts in IP by its colleges and universities.

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