University-Industry Partnerships: A Study of How Top American Research Universities Establish and Maintain Successful Partnerships

George W. Prigge, Richard J. Torraco

Abstract

This qualitative research study utilized the grounded theory tradition to examine organizational structures and processes in a purposefully selected sample of American universities that have established and maintained partnerships with industry. Institutional leaders from the corporate relations offices from fifteen of the top research universities in America were interviewed. Through a paradigm model we identified two major themes: (1) research universities that established and maintained partnerships with industry had a central corporate relations organization whose primary responsibility was to locate, secure, and maintain such partnerships and (2) these universities tended to utilize formal and regular communication mechanisms between the central corporate relations organization and other institutional units that interacted with industry. A set of conditional propositions were developed regarding the organizational structures and processes supporting the establishment and maintenance of partnerships with industry.

Introduction

"Funding provided by industry for any number of programs can play a major factor in the overall success of these universities. Partnering can also provide new opportunities for universities to reconfigure the way instruction gets funded, developed, marketed, delivered, and supported" *(Educause 2003)*.

Both universities and industry can derive benefits from partnerships. For universities, these partnerships provide financial support for the educational, research, and service missions; broaden the experience of students and faculty; identify significant, interesting, and relevant problems; enhance regional economic development; and increase employment opportunities for students. For industry, such partnerships provide access to expertise they did not have; aid in the renewal and expansion of technology; improve access to

students as potential employees; expand precompetitive research; and leverage internal research capabilities *(Prigge 2005)*.

These partnerships, however, are not without risks. Conflicts of interest between university and industry researchers, suppression of information from fellow researchers, and "undermining of academic standards" are real possibilities and must be managed appropriately in such partnerships *(Prigge 2005)*. A key for universities is to proactively manage university-industry partnerships and to put processes in place to minimize the risks to the greatest extent possible while maximizing the benefits.

This article summarizes a qualitative research study *(Prigge 2006)* performed to determine the organizational structures and processes that some of the top American research universities use to establish and maintain successful partnerships with industry.

Purpose

The purpose of the study was to understand the organizational structures and processes used by the American universities with the most successful research partnerships with industry (in terms of industry-funded research expenditures) to establish and maintain partnerships with industry. The resulting grand tour question asked was "How did American universities with the most successful research partnerships with industry (in terms of industry-funded research expenditures) establish and maintain industry partnerships?"

"A key for universities is to proactively manage university-industry partnerships and to put processes in place to minimize the risks to the greatest extent possible while maximizing the benefits."

This question was subsequently broken down into five core research questions: (Q1) Which organizational units had responsibility for establishing and maintaining partnerships with industry at these universities, and what were the relationships between these units? (Q2) What was the organizational structure of the units responsible for establishing and maintaining partnerships with industry at these universities? (Q3) What were the job titles and job responsibilities for the personnel that had responsibility to establish and maintain partnerships with industry at these universities? (Q4) What processes

were used by the organizational units responsible for establishing and maintaining partnerships with industry at these universities to proactively locate, secure, and maintain such partnerships? (Q5) What were the measures of success used at these universities to determine the effectiveness of the organizational units that had responsibility for establishing and maintaining partnerships with industry?
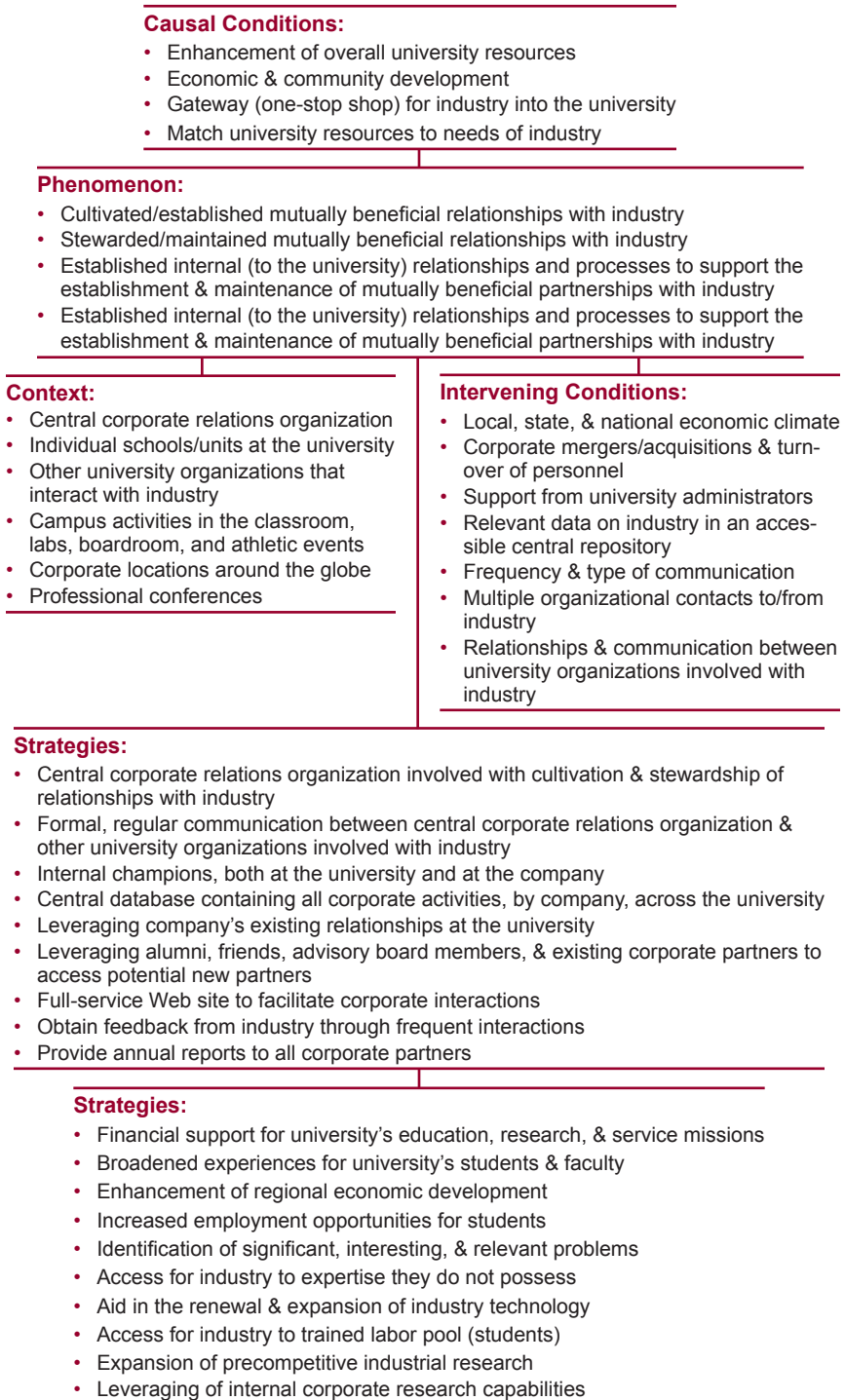
Methodology

This study consisted of a qualitative analysis of interviews of institutional leaders from the corporate relations offices of a purposefully selected sample of research universities. The sample was selected from the fifty American research universities with the highest total research expenditures as reported by the National Science Foundation for the year 2002, the latest year for which this data was available *(NSF 2004)*. The following fifteen institutions were selected, and each elected to participate in the study: Duke University, Georgia Institute of Technology, Massachusetts Institute of Technology, North Carolina State University, Pennsylvania State University, Purdue University, Stanford University, Texas A&M University, the Ohio State University, University of Iowa, University of Maryland–Baltimore, University of Rochester, University of Southern California, University of Texas, and University of Washington.

The data gathered from each institution were analyzed first using open coding, where the information was segmented into initial categories. Next, axial coding was used to assemble the data around a central phenomenon. Finally, selective coding was used to identify the story line that integrated the categories developed in the axial coding model *(Creswell 1998)*.

Data analysis and coding began as soon as the first interview was completed and transcribed. Five main categories emerged through open coding that characterized how these universities established and maintained successful partnerships with industry. These categories were: organizational structures, internal processes, cultivating relationships with potential corporate partners, stewarding relationships with existing corporate partners, and measures of success.

Relationships between the categories developed in the open coding stage were explored through axial coding. A paradigm model was developed that portrayed the interrelationships of the

Figure 1: University-Industry Partnership Paradigm

Causal Conditions:
- Enhancement of overall university resources
- Economic & community development
- Gateway (one-stop shop) for industry into the university
- Match university resources to needs of industry

Phenomenon:
- Cultivated/established mutually beneficial relationships with industry
- Stewarded/maintained mutually beneficial relationships with industry
- Established internal (to the university) relationships and processes to support the establishment & maintenance of mutually beneficial partnerships with industry
- Established internal (to the university) relationships and processes to support the establishment & maintenance of mutually beneficial partnerships with industry

Context:
- Central corporate relations organization
- Individual schools/units at the university
- Other university organizations that interact with industry
- Campus activities in the classroom, labs, boardroom, and athletic events
- Corporate locations around the globe
- Professional conferences

Intervening Conditions:
- Local, state, & national economic climate
- Corporate mergers/acquisitions & turn-over of personnel
- Support from university administrators
- Relevant data on industry in an accessible central repository
- Frequency & type of communication
- Multiple organizational contacts to/from industry
- Relationships & communication between university organizations involved with industry

Strategies:
- Central corporate relations organization involved with cultivation & stewardship of relationships with industry
- Formal, regular communication between central corporate relations organization & other university organizations involved with industry
- Internal champions, both at the university and at the company
- Central database containing all corporate activities, by company, across the university
- Leveraging company's existing relationships at the university
- Leveraging alumni, friends, advisory board members, & existing corporate partners to access potential new partners
- Full-service Web site to facilitate corporate interactions
- Obtain feedback from industry through frequent interactions
- Provide annual reports to all corporate partners

Strategies:
- Financial support for university's education, research, & service missions
- Broadened experiences for university's students & faculty
- Enhancement of regional economic development
- Increased employment opportunities for students
- Identification of significant, interesting, & relevant problems
- Access for industry to expertise they do not possess
- Aid in the renewal & expansion of industry technology
- Access for industry to trained labor pool (students)
- Expansion of precompetitive industrial research
- Leveraging of internal corporate research capabilities

axial coding categories by using the following headings: causal conditions, phenomenon, context, intervening conditions, strategies, and consequences (see figure 1).

Results and Conclusions

The five research questions put forth by this study were designed to help answer the grand tour question: "How did American universities with the most successful research partnerships with industry (in terms of industry-funded research expenditures) establish and maintain industry partnerships?" The answers to research questions Q1, Q2, Q3, and Q5 were based upon the data analysis that resulted in open coding, and the results for these four research questions are reviewed below.

Research Question 1: "Which organizational units had responsibility for establishing and maintaining partnerships with industry at these universities, and what were the relationships between these units?" The data collection and subsequent analysis showed that for the institutions surveyed, while industry interactions occurred through most of the universities' colleges, schools, or units, the vast majority (13 of 15) of these institutions did have a central organization at the university level that was responsible for establishing and maintaining partnerships with industry, regardless of the institution's size or complexity. The results also showed that for the institutions surveyed, even though formal relationships rarely existed between their central corporate relations organization and the individual schools/units, significant informal relationships did exist whereby the central organization tended to serve as a central point of contact or funnel for the majority, if not all, of the corporate relations activities that took place on campus, regardless of the institution's size or complexity.
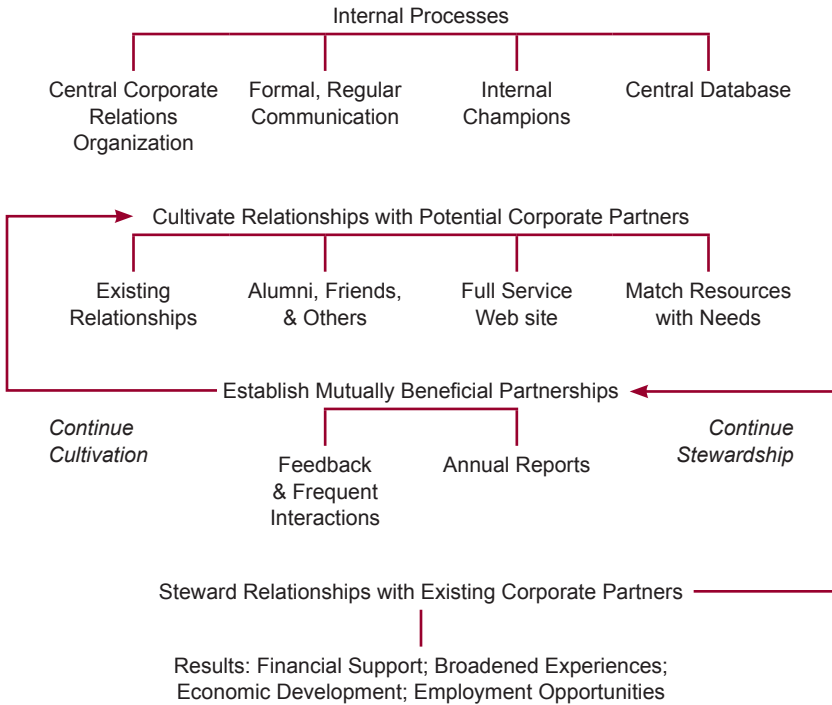
Research Question 2: "What was the organizational structure of the units responsible for establishing and maintaining partnerships with industry at these universities?" Analysis of the data showed that for the institutions surveyed that did have a central organization responsible for establishing and maintaining partnerships with industry (13 total), in ten of them this organization reported to the primary fund-raising organization for the university. The central corporate relations organizations at the institutions surveyed were typically small in size, regardless of the institution's size or complexity, with the majority of the institutions surveyed (69%) having five or fewer full-time professionals in this organization. The data also showed that the work of establishing and maintaining

partnerships with industry was not confined to the central level of the university. The vast majority of the institutions surveyed (87%) indicated that dedicated staff whose primary responsibility was to establish and maintain partnerships with industry were located in at least the major schools/units, if not all of the schools/units. At the majority of the institutions surveyed (87%), the personnel located in the individual schools/units were not organizationally linked to the university's central corporate relations organization.

Research Question 3: "What were the job titles and job responsibilities for the personnel that had responsibility to establish and maintain partnerships with industry at these universities?" For the institutions surveyed that had a central organization responsible for establishing and maintaining partnerships with industry, the data analysis indicated the majority (12 of 13) had a director or senior director as the senior official in this unit. These officials tended to operate at the same level as college and school deans or unit vice presidents. The primary goal of these central organizations was to enhance their institution's overall resources by establishing mutually beneficial partnerships.

Research Question 5: "What were the measures of success used at these universities to determine the effectiveness of the organizational units that had responsibility for establishing and maintaining partnerships with industry?" The data collection and subsequent analysis showed that measuring the success of a corporate relations program was a complicated task due to the difficulty in quantifiably measuring relationships. For the institutions surveyed, measures of success tended to be quite individual in nature, dependent upon the institution's particular interests. Although dollars were important, various sources of overall funding (both cash and gifts in kind) generated through grants and contracts, and to support faculty, students, and facilities, were identified as valuable measures of success.

Research Question 4: "What processes were used by the organizational units responsible for establishing and maintaining partnerships with industry at these universities to proactively locate, secure, and maintain such partnerships?" This question was answered using axial and selective coding. Axial coding was used to assemble the data generated during open coding around themes. A coding paradigm was created that included conditions, context, action/interactional strategies, and consequences, as depicted in figure 1. This paradigm model identified a three-stage phenomenon: (1) how these universities cultivated/established mutually beneficial partnerships with industry; (2) how they stewarded/

Figure 2. University-Industry Partnership Process

Internal Processes

| Central Corporate Relations Organization | Formal, Regular Communication | Internal Champions | Central Database |

Cultivate Relationships with Potential Corporate Partners

| Existing Relationships | Alumni, Friends, & Others | Full Service Web site | Match Resources with Needs |

Establish Mutually Beneficial Partnerships

Continue Cultivation

| Feedback & Frequent Interactions | Annual Reports |

Continue Stewardship

Steward Relationships with Existing Corporate Partners

Results: Financial Support; Broadened Experiences; Economic Development; Employment Opportunities

Adapted from Prigge 2006.

maintained these mutually beneficial partnerships with industry; and (3) how these universities established internal (to the university) relationships and processes to support the establishment and maintenance of mutually beneficial partnerships with industry.

The paradigm model also identified two major themes for research universities that were successful at establishing and maintaining partnerships with industry. (1) These institutions tended to utilize a central corporate relations organization whose primary responsibility was to proactively locate, secure, and maintain partnerships with industry. This gave the university a "common voice" to industry while serving as a central point of contact for industry and acting as a funnel for all industry-related activities within the university. (2) These institutions also tended to utilize formal and regular communications mechanisms between the university's central corporate relations organization and the other units within the university that interacted with industry to make sure "everyone was on the same page." This form of coordination helped make the entire university more efficient and effective in its overall interactions

with industry, enhancing the university's ability to speak to industry with one voice and allowing the central corporate relations organization to identify new leads for potential corporate partners while serving as a "traffic cop" between the university's various units involved with industry.

Selective coding was performed to identify a story line and write a story that integrated the categories in the axial coding model. The core category that emerged from selective coding was mutually beneficial partnerships. Benefit to *both* the university and the corporation was deemed essential in maintaining a long-term relationship.

*"Benefit to **both** the university and the corporation was deemed essential in maintaining a long-term relationship."*

The coding analyses yielded a set of propositions regarding the organizational structures and processes these universities utilized to support the successful establishment and maintenance of partnerships with industry. These propositions appear to be applicable regardless of the institution's overall size or institutional complexity.

Ultimately, a process theory was developed for university-industry partnerships. This process theory, which is depicted in figure 2, described how the research universities surveyed established and maintained mutually beneficial partnerships with industry. The process steps identified did not necessarily all occur in a specific order for everyone, but they provided a framework for understanding the process of establishing and maintaining partnerships with industry at research universities. The propositions and process theory developed were shown to support the existing literature.

This study showed that in order to establish and maintain mutually beneficial relationships with industry, universities must proactively manage their relationships with industry, putting processes and organizational structures in place to reduce or eliminate risks while maximizing the benefits to both industry and themselves. Regardless of the type of organizational structures and processes universities employed, recognizing the importance of industry partnerships to their overall bottom line was of primary importance.

"Seeking corporate and foundation support has become a specialty in great demand" *(Gregory 2000, 27)*. Even for individuals at universities who are involved with establishing and maintaining partnerships with industry, many questions remain regarding the best way to go about this. This research study documented how

some of the leading research universities in America established and maintained partnerships with industry. Analysis of this process revealed that the universities did not use a "one size fits all" approach to establish and maintain successful partnerships with industry. However, a set of theoretical propositions generated from the data describe what appear to be successful practices at some of the nation's top research universities. These practices could be modeled at other institutions if appropriate. If managed properly, the establishment and maintenance of mutually beneficial university-industry partnerships can be a win-win-win for the university, for industry, and for society.

Implications of the Study for Further Research

Several other areas could be investigated to provide a more comprehensive understanding of university-industry partnerships. One particular area in which little research has been done is the assessment of the economic impacts of such partnerships on both universities and industry. The literature suggests that such partnerships have a positive economic effect on both the university and industry, but further study is needed to quantify these impacts. For universities, financial data clearly indicate the amount of industry funding received by institutions of higher education, but the exact disposition of these funds leaves room for further research. What percentage of funding received from industry is used to support students, faculty, facilities, and other initiatives? Depending upon the use of the funds, the university may elect to pursue these funds from industry in different ways, which could in turn affect the processes, procedures, and organizational structures employed to obtain them.

Similar unexplored areas remain for industry. Just how do industry partners invest in institutions of higher education? Do they direct their funds toward specific programs, and if so, why? The Council for Industry and Higher Education in the United Kingdom surveyed a designated "Top 200" U.K. companies together with the largest U.K. financial institutions to determine just what companies do and spend to support higher education in Britain *(White and Horton 1991)*. A similar study in the United States could greatly benefit American universities by providing a better understanding of industry's needs and desires. With such an understanding they could more effectively cultivate potential corporate partners.

Another important area of research would be to survey industry's satisfaction with the value received from supporting higher

education. While the question posed in the U.K. study is an important one to universities (What do companies do and spend to support higher education?), equally important to understand is just how satisfied these companies are with the value they receive from these investments. This information would be beneficial to universities as they attempt to improve the processes they use to cultivate new relationships with industry and steward existing ones.

This study showed that the majority of institutions surveyed house their corporate relations functions in the institution's fund-raising organization. While some indicated that this was due more to organizational legacy than conscious intent, it still sends a message to industry that corporate relations is primarily focused on fund-raising rather than creating partnerships that extend beyond financial philanthropy. Is this the right focus for these institutions of higher education? Should they take a broader view? Is it possible to do both?

> *"As public funding for higher education continues to decline, universities will be forced to aggressively seek different sources of private funding in order to survive."*

Each of the areas for further research identified above holds information that could significantly impact the success of university-industry partnerships. Further examination of one or more of these topics could affect how universities establish and maintain partnerships with industry.

In *Innovation U: New University Roles in a Knowledge Economy (Tornatzky, Waugaman, and Gray 2002, 9)*, the authors stated, "The most successful American higher education institutions in business–higher education partnerships have demonstrated a very pluralistic and individually tailored approach to the evolution of their practice of partnering." They went on to state, "We believe that there are several organizational factors that can contribute to the development and maintenance of partnering activities . . . (1) leadership; (2) supportive conceptual and language systems; (3) organizational structures and policies; and (4) the state and regional policy and political context" *(173)*.

The results of this qualitative research study may help us understand the processes and procedures that the American research universities with the most successful research partnerships with industry use to establish and maintain these partnerships. Slaughter

and Rhoades *(2004, 205)* wrote, "The pursuit of academic capitalism . . . extends beyond research universities. Even within small, private liberal arts colleges in the United States, there is evidence of a programmatic push toward the private marketplace, particularly in less prestigious colleges." These results should provide other universities, whether they are research universities or "small, private liberal arts colleges," with ideas for enhancing their own methods of collaboration with industry. They may also provide industry a better understanding of how these universities approach partnerships with industry.

Universities and industry have had a long history of collaboration. As public funding for higher education continues to decline, universities will be forced to aggressively seek different sources of private funding in order to survive. As a result, university-industry partnerships will become much more important in the future. The literature is replete with examples of the benefits and risks associated with such partnerships. As these sorts of partnerships continue to proliferate, it is incumbent upon universities to clearly recognize the benefits and risks associated with them in the beginning and to put organizational structures and processes in place to maximize the benefits while minimizing the potential risks.

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About the Authors

• George W. Prigge, Ph.D., is the assistant dean for administration and finance for the Georgia State University College of Law, where he directs a service-focused organization that provides all administrative support functions to the college's faculty, staff, and students. Prior to joining Georgia State, he established and maintained successful university-industry partnerships for both industry and universities while with Lucent Technologies and the Georgia Institute of Technology respectively.

• Richard J. Torraco, Ph.D., is an associate professor in the Department of Educational Administration at the University of Nebraska–Lincoln, where he is a faculty member in the educational leadership and higher education program and serves as the coordinator of the graduate program in human resource development. He is the editor of *Human Resource Development Review* and has served as editor of the *Academy of Human Resource Development Conference Proceedings* and as the vice president for research for the Academy of Human Resource Development.