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Improving Industry-University R&D Partnership Project Management: A Pilot Study

Quamrul Hasan* and H. M. Belal

Knowledge Science Research Lab, School of Technology Management and LogisticsCollege of Business, University Utara Malaysia, 06010 Sintok, Kedah, Malaysia

ABSTRACT

In April 2004, a new law turned Japanese national universities into independent public corporations. This change has increased pressure on them to look to industry for more support than ever before. Since one of the laboratories in Japan Advanced Institute of Science and Technology's (JAIST's) School of Materials Science is involved in a collaborative project with two industrial partners (one large and one small), we saw an excellent opportunity to conduct a pilot study on an industry-university knowledge partnership for a scientific research and development project in the Japanese national university setting. The purpose of our study is to identify both which areas and considerations have the most influence on such projects and how such projects can be improved. This paper presents our methodology and data results. Most importantly, it presents a list of specific suggestions for improving project performance. Although it was a pilot study with a small number of respondents, this study still may have significance in terms of the suggestions for improving collaborative projects and in regard to the data-gathering methodology we used. We planned to provide results of the study to the project team members and recommend they apply the most important suggestions for improving their project. We also planned to do a follow-up study to determine whether or not the project is improved by the implementation of these key suggestions.

Keywords: Industry-University, R&D partnership, relationship with partner, project management, knowledge creation

***Correspondence to Author:**
Quamrul Hasan
Knowledge Science Research Lab,-School of Technology Management and Logistics, College of Business, University Utara Malaysia, 06010 Sintok, Kedah, Malaysia
quamrulhasan@gmail.com

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INTRODUCTION

To sustain in today's highly competitive business environment, companies are eager to prove themselves as the solution providers rather than typical product producers. Engaging the customers in the knowledge co-creation process is a core to create a new service as a solution (Belal et al. 2013). In this circumstance, typical companies are under pressure to enhance their performance capability as a solution provider. Since typical manufacturers are generally structured with technology and engineering strengths only, therefore, to meet with current business trend and gain competitive advantages as well companies are seeking to innovate knowledge with the aim of making successful research and development project to produce new services as the solution desired by customers.

The beneficial and strategic corporate partnership is one of effective mechanism to all who are pushing organizational knowledge co-creation practice. Generally, universities are known as a source of new concepts (European Commission 2007) in new scientific and technological innovations as well as in the skilled development of technical personnel (Nelson 2003; Shane 2004; Stephan 2001; Thursby and Thursby 2004) for improving idea generation process. On the other hand, in this, industry plays a complementary role by offering other necessary resources to utilize these concepts in the practical field (European Commission 2007). Therefore, making strong and beneficial relationship between university and industry and working in partnerships are crucial for a successful R&D (European Commission 2007) that can be transformed into processes of furnished products, and services.

In today's competitive business environment (Bettis et al.1995) industry-university (IU) partnerships offer a potentially powerful alternative to inter-firm collaborations. In the past, IU partnerships were primarily 'sponsorship' relationships, in which industrial firms provided university researchers with resources and financing. In this way, many firms valued university research principally for solving specific problems or building basic knowledge when the horizon was long-term.

The shift of today's economy from traditional business view into knowledge-based view has also brought about a shift in IU relationships from 'sponsorship' to 'partnership', with ongoing interaction the major focus (Betz 1996). Although many industrial firms still think of universities as simply a source of basic knowledge and highly trained students and graduates, and while the partnering process is not always managed properly, universities can be valued partners providing complementary expertise, knowledge and resources that are often unavailable within the industrial community (Jacob et al. 2000).

As a result of these changes, more and more scientific research and development is being done in a collaborative way, often including both universities and companies. At the same time, there is increasing interest in the management of technology, including ways to improve the effectiveness of scientific research and development projects.

JAIST has activities in both areas above. One of the laboratories in the JAIST School of Materials Science is providing the research and development service for a collaborative project. The project team includes with a small local company, which is providing the manufacturing capability for a making product, and a large multinational company, which is providing the raw materials, technology, and others skills for manufacturing products and its marketing. In addition, one of the Centers of Excellence at JAIST is developing the knowledge science bases for the management of technology to ensure value for providers and recipients.

Given this situation, we saw an excellent opportunity to conduct a pilot study on collaborative scientific research and development projects. The purpose of our study was twofold: (1) identify what areas or considerations have the most influence on such

projects, and (2) identify how such projects can be improved. Our assumption was that any project, unless its progress was considered excellent, could be improved; this assumption was confirmed by all of our questionnaire respondents.

The rest of the paper is structured as follows. Section 2 describes the methodology of this research. Section 3 presents analysis of data and findings including with discussion, and the final section concludes the paper with a summary.

METHODOLOGY

A written questionnaire (see Appendix) with 5 main questions was prepared in two versions, English and Japanese, so that the respondents could use the version they felt more comfortable with. Questions 1 and 2 ask the respondents to make choices from the material presented. It should be noted that the areas included in question 2 were chosen based on discussion between experienced project managers and on consultation with a faculty member who includes project management material in his courses. Questions 3 and 4 ask the respondents to provide explanations in regard to the choices they made in question 2. Question 5 asks the respondents to provide any comments in addition to the explanations they gave in question 4.

The first 3 respondents were selected because they were the official project representatives from their respective organizations: a Professor in the JAIST School of Materials Science, the President of the small, local Japanese company, and a regional manager of the large multinational company. Two additional respondents were chosen from JAIST because of their direct involvement with the project: a laboratory technician and an administrative assistant.

This survey was carried out in the following way. First, the questionnaire was distributed to the selected respondents via E-mail. It turns out that there were some difficulties with this procedure in regard to both completeness and timeliness; these difficulties necessitated supplemental phone or person-to-person follow up to complete the data gathering. Note that the need for translation between English and Japanese for the two respondents who used the Japanese version may have resulted in changes to the exact wording of the respondents' comments.

After collection of the completed questionnaire, the results were analyzed and summarized by the author.

DATA ANALYSIS AND DISCUSSION

Identifying what areas or considerations have the most influence on collaborative scientific research and development projects: The top five areas or considerations named by the respondents as having the most influence on such projects are as follows: (1) relationship with partner (100% of respondents), (2) project management – considering both the amount and style of management (80% of respondents), (3) project organization – considering authority, responsibility, level of effort, reporting chain, and communication channels (80% of respondents), (4) previous experience of team (60% of respondents), and (5) resources – considering staff, both number and qualifications, facilities, equipment, and materials (60% of respondents).

Although we were interested in identifying only the top five areas or considerations, it is worth noting that 40% of the respondents named two other considerations: funding and time, while 20% of the respondents named two more areas: relationship with the sponsor and intellectual property.

Identifying how such projects can be improved: The following lists as shown in table 1; table 2; table 3; table 4; and table 5 summarizes the comments of respondents regarding how to improve such projects in the top five areas or considerations named above

Table 1. For relationship with partner

WHAT	Improve business alignment
HOW	Provide effective communication and leadership
WHAT	Clarify expectations of all parties
HOW	Provide a clear plan of the roles and services of all team members
WHAT	Clarify business and technical directions of the project
HOW	Increase the amount of face-to-face discussion
WHAT	Clarify each partner's expectations and roles
HOW	Establish communication and negotiation mechanisms
WHAT	Keep the relationship good
HOW	Communicate more often, directly or through a project coordinator; specifically, have more frequent meetings to exchange information and to compensate for a lack of knowledge or skills

Table 2. For project management

WHAT	Increase or improve leadership
HOW	Define and make clear project leadership and organization; clarify project, objectives, and timing
WHAT	Improve understanding of the project
HOW	Make the objectives, action plan, and timing clear
WHAT	Improve project management
HOW	Employ a full-time project manager and/or create a task force to support the project manager
WHAT	Harmonize different interests
HOW	Involve professional consultant and employ project manager

Table 3. For project organization

WHAT	Improve organization itself
HOW	Build concrete organization chart, including roles and responsibilities
WHAT	Clarify organization
HOW	Announce clear roles and responsibilities
WHAT	Harmonize different interests and responsibilities
HOW	Involve professional consultant and employ project manager
WHAT	Clarify lines of authority and communication channels
HOW	Re-establish organization charts

Table 4. For previous experience of the team

WHAT	Minimize the gap between small and large companies
HOW	Involve professional consultant and/or employ project manager
WHAT	Increase amount of team interaction
HOW	Hold more meetings with all the people directly involved
WHAT	Improve on the lack of project experience
HOW	Hire a strong and experienced project manager

Table 5. For resources

WHAT	Improve small company's staff abilities
HOW	Employ qualified and experienced staff
WHAT	Increase resources
HOW	Employ a project manager and experienced researchers
WHAT	There is a need for a project manager
HOW	Employ a project manager

Summary of suggestions for how to improve project performance

Based on responses to the "How" section of Question 4, specific suggestions for improving project performance can be grouped into three categories as follows:

People: The most important person listed was a project manager or coordinator (8 responses). Next came a professional consultant (3 responses) or a task force to support the project manager or coordinator (1 response). Last came qualified and experienced research staff (2 responses).

Communication: Effective communication mechanisms (2 responses) and more meetings (face-to-face) and discussions with all the people directly involved (also 2 responses) were most mentioned. More frequent communication to exchange information was also mentioned (1 response).

Management Aids: Most mentioned was a clear plan of roles and services (4 responses). Next was a clear organization (3 responses). This was followed by clear goals and objectives (2 responses). Garnering 1 response each was the following: clear expectations, clear action plan (both technical and business), and clear timing.

CONCLUSION

Industry-University R&D partnership is one of the core mechanisms in knowledge co-creation process for science and technological innovation policy which leads to business and economic sustainability. Nevertheless, making a success of this industry-university R&D partnership project and its improvement for a breakthrough in the human life quality, social, national and economic issues are difficult tasks. Keeping this issue in our mind, we have conducted this pilot study. Given the context of our pilot study, we believe that we have accomplished our twofold purpose of identifying what areas or considerations have the most influence on collaborative scientific research and development projects and identifying how such projects can be improved.

This was a pilot study with only a small number of respondents, but it still may have significance in terms of the suggestions to improve university-industry collaborative scientific research and development projects in terms of the data-gathering methodology we used.

We plan to provide results of the study to the project team members with a recommendation to apply the most important suggestions of how to improve the project operation under the context. In addition, we plan to do a follow-up study to determine whether or not the project is improved by the implementation of these key suggestions. Finally, we plan to suggest that, a similar study with a larger number of respondents should be carried out in the near future.

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