

Management levels involvement in strategic R&D decisions in firms

Amiram PORATH

Amiram Porath Consulting
E-mail: amirampster@gmail.com
Telephone: +972-54-8028171

Abstract

Long-term R&D activities and especially Collaborative Research (CR) with other firms and with the academy are considered by nature as strategic. Such decisions not only commit resources like other decisions but also set a focus for the R&D units in the firm for the future.

A recent research found that firms dealing with CR make decisions regarding participation with a limited number of management levels involved. This finding supports the claim that the CR participation decision is a strategic one and that the upper management should be aware of opportunities if they are to approve participation.

This observation is important when dealing with the dissemination of such CR supporting programs, as is discussed in the last section of the article below.

Keywords: *research and development, management involvement, strategic decisions*

JEL Classification: O32

Introduction

The Lisbon Agenda and its updates have established the need for increasing the cooperation between the research community and industry (EU, 2006), the end being the establishment within the EU of the “Knowledge Based Society” (EU, 2003) with the final aim, to make Knowledge the basis of the EU economy.

Based on these intentions, the Commission has updated its tools for promoting this end. When looking at the changes the EU Framework Programme for Research and Technological Development (FP), has undergone since the 5th FP, to the current FP7 one can see evidence to that effort. FP5 was a relatively simple framework with 5 programs included (FP5 Programmes, 2009), four thematic programmes supporting research:

- 1) Quality of Life and management of living resources
- 2) User friendly information society (IST)
- 3) Competitive and sustainable growth (GROWTH)
- 4) Energy, environment and sustainable development (EESD)

Added to them was the Euroatom programme as a research program (an optional part to participants) and horizontal programs intending to supply additional activities (not thematic):

- 1) Confirming the role of community research (iNCO II)
- 2) Promotion of Innovation and encouragement of SME participation
- 3) Improving human research potential and the socio-economic knowledge base
- 4) Direct actions joint research centre.

This respectable FP with its thematic programmes and financial support models may have been deemed as complex, but it was nothing compared to FP6 and FP7 that followed it. By adding the battle against brain drain and the emphasis on increasing the researcher mobility internationally, and between the sectors of academy and industry the relatively simple 3rd horizontal programme has become a complex framework by itself (EU FP7, 2009).

The complexity of the thematic programmes has increased even more by turning them into 10 thematic programmes with additional super programmes dealing with regional development and scientific excellence.

While the purpose of this article is not to describe the evolution of the FP over the last decade or so, it serves to show that the issue of CR and its supportive programmes is complex. Another rule of thumb is the proliferation of consultants advising firms and research organizations regarding the FP and the fact that organizations dealing with these programmes on daily basis have created special divisions / offices to deal with it.

When dealing with Collaborative Research in the form discussed here, we refer to the cooperation in R&D among firms and academy bodies regarding generic technology, while the firms compete in the market place with their products (sometimes based on same generic technology). The CR is relatively new, emerging in both major areas for such cooperation, the US and the EU, only since the mid-80's (Miyagiwa and Ohno, 2002) following removal of restrictive laws. To further foster that action – deemed economically positive, the change in legislation allowed governing bodies to financially support CR. Which in turn created a fertile research environment for research into the economic nature of CR and the development of numerous models (Katz, 1986; D'Aspremont, & Jacquemin, 1988; Kamien, Miller, and Zang, 1992; Laredo, 1998; Pastor & Sandonis, 2002). Some of the literature focused on different players (, Rosenberg, 1990; Lukkonnen, 1988), while other writer preferred to research different disciplines such as social and organizational theories (Thursby, Thursby, & Mukherjee, 2005; Stern & Pozner, 2007) and even a few multi-disciplinary comprehensive models (Doz, Olk, & Ring, 2000; Fontana, Geuna & Matt, 2006; Porath, 2008).

The important nature of CR and its strategic implications regarding future generations of products, new markets and the activity of the firm made the decision process regarding entry or not into CR projects, very interesting.

How do decisions to participate or not, evolve in firms? Does the management level making the decision do it, based on familiarity with the programmes?

Ever since the firm was considered as making balanced and informed decisions (Penrose, 1959) it was understood that the decision-making organ within the firm requires some basic information in order to make a decision. This article will not go into the complicated world of decision making literature but will try and see how the involvement of high level management in the decision making process requires better understanding of the characteristics of the support programmes.

Research

Research question

Considering the above, the research question is: Is senior level of management involved in the decision to enter or not an R&D consortium?

This could be translated into working hypotheses:

- 1. High level management will be involved in decision making regarding CR consortium entry;**
- 2. Few levels of management will be involved in making the entry decision into a CR consortium.**

In companies where the upper level management is involved following discussion at several lower levels it can be argued that the upper level is not actually making the decision but rather ratifying it. In such cases the involvement of the senior level management is more in a mode of notification to it that the firm is about to engage in such an activity. It stands to reason that when only one more level is involved that the senior management is actually the deciding body. Therefore the suggestion above is to check that senior management is involved and also how many levels are involved in the process. These two working hypotheses presented as questions will help answer the research question.

Instrument

As part of a large research into the forming mechanisms of R&D consortia, a questionnaire was developed and employed. This questionnaire was adapted from a validated questionnaire used by Dyer and Nobeoka (2000). The original questionnaire referred to US registered consortia, organized voluntarily without government funding. In this research the R&D consortia researched were part of the Israeli Magnet programme financed by the national government. The questionnaire was adapted to these specifications; the main parameters however, remained unchanged.

Population

The Israeli Magnet programme started operation in 1994 and has up to 2007 initiated and financed under 40 (about 37) CR consortia. At the time 11 consortia were active and members of them could easily be identified (Porath, 2004) covering most of the industrial areas existing in Israel. In recent years consortia have been formed (approved for financing, established and started R&D operations) at the rate of 2-3 per year. The Israeli Magnet programme is defined as generic long term research, (no more than 30% of the firm's research budget can be allocated for such consortia, per the programme regulations) which reduces the number of firms that are involved or are ready to be involved (Porath, 2004).

The overall population identified included firm managers and project managers who were involved in the process of making the decision to join the consortium and have experience of its operation and functioning (due the high rate of personnel change in high tech companies during the 1990's and early 2000's), was estimated to be very small. Firms participating in a consortium tended to participate in following consortia, which further reduced the number of potential responding persons.

Methodology

The rate of response was ninety-seven questionnaires received out of 220 sent or handed out to members of Magnet consortia, making it a 44.1% response rate. Members could be identified of the 33 Magnet projects existing at the end of data collection (60%) of which members from 20 responded. Tracking of members of the older and some others proved very hard due to the high rate of personnel change in the high-tech industry, firm mergers and dissolvent etc. While some of the questionnaires were sent by mail, the most effective data collection method seemed to be combined of sending the questionnaires, interviewing the members and filling the questionnaire with each one. The director manager of the programmes assisted by supplying a support letter but that proved as legitimizing step only, not sufficient to induce the potential responders into filling the questionnaire wholly. The sample consisted of different level managers involved in the decision-making and management of the consortia and the members in each consortium responding. Some of the responders were veterans of several consortia, while others were newcomers to the programme.

Statistically the analysis was adapted to the specific needs of the research. The parts relevant to this discussion are described in the section below.

Results

There were two questions in the questionnaire out of 25 complex questions related to management involvement in entry decision making. The results and the analysis of the two questions are presented below.

Questions regarding decision making (join the consortium)

Question 8 of the questionnaire referred to deciding on joining the consortium - Forming a committee rather the recommendation of a single person, to decide regarding joining a consortium. As the question offered a YES / NO choice the analysis refers to the number of responses in each direction. The involvement of a committee in the decision rather than a single person as a recommendation emphasizes the role of the management in the decision making and increases the support to the claim that this is a strategic decision, or is at least regarded so by the management.

Table 1 – Q8 Statistics

Item	Yes	No
Will you form a committee?	64.8%	35.2%

As can be seen, in most firms the decision to enter a consortium would follow the evaluation work of a committee, an indication of the multi-departmental effort expected of such a decision.

The second question relevant to management involvement in decision-making in the questionnaire (question 20), asked how many management levels would be required for approval of participation in the organization?

This was an open question requesting the answering person to write a number. The answers varied between 1 and 3 with 2 getting 56.0% of the answers, 1 getting 28.8% and 3 getting 15.2%. There were no more levels involved. As can be seen 1 and 2 levels were used in 84% of the cases.

Table 2 – Q20 statistics

Item	Mean	Median	Mode	SD
Two levels of management	1.87	2.00	2	0.655

Discussion and conclusions

The results show that in the most cases (over 84%) there were 1 or 2 levels of management involved in deciding to enter a CR consortium. Further to that in most cases the decision was made following the work and recommendation of an internal interdisciplinary committee.

It is important to bear in mind that the firms in the sample were not start-up firms, but rather more mature firms and therefore the assumption that the small number of management levels involved is due to the size of the firm is rejected. As the Israeli Magnet program regulations demand firms participating will spend no more of 30% on such generic R&D of their total R&D budget. The majority of the firms are medium-large according to Israeli standards, deal with export of their products or services, and in most projects relevant to telecommunications are players on the international level. It is therefore safe to assume that the firms

would have more than two and even three levels of management. As the joining requires a firm commitment regarding IPR issues that also assures that the levels involved are the top levels of management.

The involvement of the top management in the decision is important when considering the dissemination of the information regarding the CR programmes. As mentioned above such programmes are often complex in their regulations, application requirements, reporting and accounting. That complexity which is the result of the different ends of such CR programmes. The programmes while normally not as complex as the FP, are by the nature of the cooperation between different sectors (Industry and Academy) and the regulations imposed due to the government support, are naturally at least complex enough to require some delving into and learning of the regulations and by-laws.

Some of the programmes, such as the Israeli Magnet Programme require the formation of a special legal entity which complexes the administrative understanding required in order to make the join / not join decision.

While firms and especially firms from medium size and up, in the High-Tech sectors are used to apply for R&D support for product development to different programs, the involvement with Generic research and specifically with CR is normally more limited. The effort required for participation in a CR is bigger than that of a single firm involved in individual R&D. Therefore in most cases, firms will be involved in CR projects sequentially or in a limited extent. Therefore while the upper management may be familiar with and used to seeing requests for approval for individual R&D support, that is not the case with CR programmes.

The result of the fact that management is less familiar or used to CR programmes makes the decision process more difficult and lengthy. CR programmes promoters should take that into account. These promoters, being normally government agencies, should realise that in order to better promote their programmes they need to invest effort and resources in “educating” or disseminating programme related information to upper management. That is more difficult than disseminating the same information to R&D managers. Just getting the share of mind and time of the upper management is more difficult than the same action with R&D managers.

Limitations to the research

The sample size is a limitation to the research. However for our purposes and the type of analysis it can be claimed to be indicative in the way we wish to understand the operating mechanism.

Another limitation is the sector cover. Only a limited variety of sectors were covered, mostly in telecommunication and related sectors. The other sectors had limited if any representation in the Magnet programme consortia. However, considering the strategic nature of the decision discussed and the result of the sector covered that limitation does not seem too critical. In order to overcome that limitation similar research in programmes covering more sectors should be

pursued.

Bibliography

1. D'Aspremont, C., & Jacquemin, A. (1988). *Cooperative and non-cooperative R&D in duopoly with spillover*. *The American Economic Review*, 78, 1133–1137.
2. Doz, Y. L., Olk, P. M., & Ring, P. S. (2000). *Formation processes of R&D consortia: Which path to take? Where does it lead?* *Strategic Management Journal*, 21, 239–266.
3. Dyer, J. H., & Nobeoka, K. (2000). *Creating and managing a high performance knowledge-sharing network: The Toyota case*. *Strategic Management Journal*, 21, 345–367.
4. EU. (2003). Communication from the Commission; Investing in research: an action plan for Europe. *COM (2003) 226 final/2*.
5. EU. (2006). Report of the CREST expert group on: Encourage the reform of public research centres and universities, in particular to promote transfer of knowledge to society and industry. *Final report, March*.
6. EU FP7- description downloaded from <http://cordis.europa.eu/fp7/> on December 7th 2009.
7. Fontana, R., Geuna, A., & Matt, M. (2006). *Factors affecting university – industry R&D projects: The importance of searching, screening and signalling*. *Research Policy*, 35, 309–323.
8. FP5 programmes description downloaded from <http://cordis.europa.eu/fp5/programmes.html> on December 7th 2009.
9. Kamien, M. I., Muller, E., & Zang, I. (1992). *Research joint ventures and R&D cartels*. *The American Economic Review*, 82(5), 1293–1306.
10. Katz, M. (1986). *An analysis of cooperative research and development*. *Rand Journal of Economics*, 17, 527–543.
11. Laredo, P. (1998). *The networks promoted by the framework program and the questions they raise about its formulation and implementation*. *Research Policy*, 27, 589–598.
12. Miyagiwa, K., & Ohno, Y. (2002). *Uncertainty, spillovers, and cooperative R&D*. *International Journal of Industrial Organization*, 20, 855–876.
13. Pastor, M., & Sandons, J. (2002). *Research joint ventures vs. cross licensing agreements: An agency approach*. *International Journal of Industrial Organization*, 20, 215–249.
14. Penrose, E., T. *The theory of the growth of the firm*. Basil Blackwell, Oxford UK, (1959).
15. Porath, A. (2004). *Intellectual property by-laws in national and multi national programs: A comparison of the EU Framework Programs and the Israeli Magnet Program*. Proc. Inter. Conf. EARMA, Bucharest,

Romania.

16. Porath, A., *Joint Venture Forming mechanisms under structured programs. working paper. Proc. PhD workshop at Austauschprozesse: Extracting the value out of University-Industry Interaction.* Muenster, Germany (2008).
17. Stern, I., & Pozner, J. E., *Organizational size, performance and frequency-base imitation: A test of competing hypotheses.* ISC conference, Jerusalem, Israel, 2007.
18. Thursby, M., Thursby, J. & Mukherjee, S. (2005)., *Are there real effects of licensing on academic research? A life cycle view.* NBER Working Paper No. 11497.