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Evaluating non-core technologies: Contrasting external and internal views on corporate research results

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ABSTRACT

Nowadays, many research organizations extract information from research findings that are, as such, not feasible or valuable for their own use. It is crucial for any organization conducting extensive research activities to have effective and efficient methods so that they receive maximum economic benefit from research outcomes. Two separate mail surveys were implemented to find appropriate measures for evaluating research outcomes from both internal and external perspectives. The results of this exploratory study show a wide gap between the internal and external respondents, when considering meaningful and appropriate measures for judging the commercial potential of non-core technologies. Based on the identified gaps between internal and external views, the study suggests several propositions to guide further theoretical work. Further research is needed to validate the observed differences between the internal and external perspectives on utilising non-core technologies. Moreover, the underlying reasons for these differences would provide a fruitful opportunity for future research.

1. Introduction

One of the most vital tasks for a research organization is carrying out on-going exploration of new ideas and technologies. This exploration inevitably produces – by its nature – many findings, which are, as such, not feasible for further development within that organization. Tao, Daniele, Hummel, Goldheim, and Slowinski (2005) argue that even sophisticated companies utilise less than 30% of their patents and the rest sit on the shelf. In addition, important and vital innovations are neglected and remain un-commercialized as a research surplus in many companies, threatening their long-term survival and existence (Christensen, 1997; Lehrer, Nell & Gärber, 2009).

Extracting value from research surplus is challenging, since non-core activities compete with core activities for scarce resources, and often, technology licensing meets intra-company resistance (Goldheim, Slowinski, Daniele, Hummel & Tao, 2005; Galbraith, DeNoble, Ehrlich & Kline, 2007). However, continuous competitive pressure has compelled many research organizations to find new ways to gain more revenue and to create new businesses from research surpluses (Blau & Harris, 1992; Chesbrough, 2004; Chesbrough, Vanhaverbeke & West, 2006). Instead of acting as 'shelf-warmers' that collect dust on the shelves of the R&D unit, they could be exploited and commercialized by other organizations if the proper instruments existed (Grimpe, 2006). Technologies that do not fit in the parent company's core businesses could be licensed out, sold, brought to the market via spin-off or start up or even donated (Chesbrough, 2003b; Narayanan, Yang & Zahra, 2009). The utilisation of research surplus is important in managing the commercialization of research findings and results, especially from the open innovation point of view.

Three drivers may exist behind this development. Firstly, a firm may attempt to cover sunk costs incurred by the development phase that did not lead, for any reason, to further actions. Sometimes, sunk costs may rise to a remarkable level (Keil, 1995). Selling a technology that does not fit into the firm's current strategy, business model or product/research portfolio may produce income

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that, at least partly, covers developmental costs. Secondly, although sunk costs presumably also exist, the main driver is the creation of a new revenue source (Kuczmarski, 2000). Alongside the firm's core business, many firms are striving for other revenue sources that could generate a significant source of income. Unlike the previous driver, in this case, the firm typically does not totally detach itself, but sells the licence to another company to perhaps generate a small, but constant flow of income. Instead of licensing, another possible strategy could be some kind of revenue sharing (van der Heijden, Potters & Sefton, 2009). Moreover, it may be possible to create another revenue stream alongside the initial royalty payments, for instance, by offering consultancy to companies that have already licensed innovations (Chesbrough, 2003a). Thirdly, a firm may use external interest to gain internally legitimised status for new ideas or innovations. In some cases, innovations may encounter internal inertia and to displace this inertia, external power is used to also induce internal interest. Hence, the third driver is tightly involved with strategic issues.

Identification of commercially appealing ideas is seldom straightforward. Although the parts of a business idea construct the basis for the evaluation of commercial potential of an incomplete non-core technology, i.e., the research surplus (see e.g., Normann, 1977), a more comprehensive approach is needed. Furthermore, the evaluation process needs to be carefully designed in order to find the appropriate personnel to implement it at each stage (Galbraith et al., 2007). This leads us to the question: how is the commercialization potential of non-core technologies evaluated? Two different parties are involved with the evaluation and commercialization of non-core technologies: the one that discovers the technology (internal perspective) and the one that can make use of the technology (external perspective). Therefore, in corporate research, we are also interested in this question: what differences exist between internal and external perspectives when evaluating commercial potential? These research questions are tackled with an exploratory survey of two groups: the internal and external agents of a company.

2. Evaluation as a part of commercialization

The evaluation of new technology and research surplus must support the commercialization process. There are many options open for the realisation of revenue from non-core technologies, such as licensing fees, direct sell-offs or founding a new business around an idea (Parhankangas, Holmlund & Kuusisto, 2003). They all have unique features that affect their risk and return expectation rates. The evaluation and its outcome will affect which of the options are worth considering. For example, if after the evaluation, the management decides that the technology in question will not be developed further internally, the decision will then exclude options of 'internal development in existing businesses' and 'internal development in corporate venturing unit'. On the other hand, different commercialization options may have some specific features, questions or demands that the evaluation must be able to answer. An example is the option to form a spin-off. The spin-off provides strategic freedom, but concurrently requires attention and commitment of resources much more than some other options do. Thus, to tap the fullest potential, the evaluation process must be flexible and usable to all the requirements of the commercialization process.

After the research phase, the outcome of a project needs to be defined as a core or a non-core technology by the parent company or its strategic business units (SBU), according to their technology strategies (see Fig. 1). The outcome must be assessed from the viewpoints of the corporate and business units' technology strategies and then it must be decided whether or not the outcome fits the strategy (Loch & Staffan Tapper, 2002). There are two kinds of outcomes that fall into the 'not commercialized by the parent company' category: intentional and not intentional (Grimpe, 2006). Intentional outcomes can be called 'shelf-warmers', for they were intended for discovery, but were not commercialized. Unintentional outcomes can be called 'gadgets'; they refer to unintended findings that have no chance for commercialization. However, this kind of separation into shelf-warmers and gadgets may not be reasonable, since this separation depends upon the current understanding of the potential users — and that current understanding might be short-sighted or even totally incorrect.

The evaluation process itself is an iterative process. It would be of great help to the post-evaluation if the non-core technologies were already properly evaluated during the research process. The outcome must be stored to the portfolio of non-core technologies, which is here called the Research Surplus Portfolio (RSP). The RSP is a tool for managing non-core technologies. It is an electronic inventory of the research surplus and a tool for assessment of future technical and commercial options of non-core technologies. The ultimate purpose of the RSP is to identify appropriate ways to bring a non-core technology to market, and furthermore, to facilitate new business creation and opportunity-seeking.

Storing the outcome to the RSP is the first stage in evaluating the outcome from the perspective that it could be further developed and commercialized by an outsider or in co-operation with outsiders. This outcome storage forms a basis to which

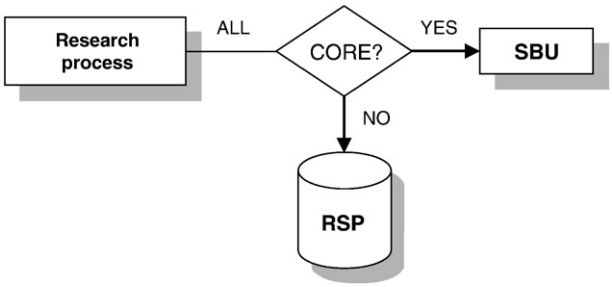

Fig. 1. Non-core technologies are stored to research surplus portfolio.