

Outsourcing product development operations to emerging country providers –

A paradox?

Taina Paju

Turku School of Economics

taina.paju@tse.fi

Abstract:

The ability to innovate is an important source of competitive advantage for firms operating in the most developed countries of the world. Complexity and multidisciplinary nature of modern technologies pushes companies to seek for external expertise to support their R&D. Outsourcing R&D operations to emerging country providers has become a possibility to which more and more of the firms are resorting. This operation mode is, nonetheless, full of ambiguities on the level of the firm as well as on national level. This paper discusses the paradoxical issues in transferring the responsibility for knowledge-intensive operations to an outside provider that is, furthermore, located offshore. The paper arrives at theory-based proposition for future empirical research to be studied.

Key words: capabilities, emerging country, outsourcing, offshore outsourcing, product development, R&D

1. Introduction

The complexity of technology development and science, combined with shortening product life cycles and increasing risk and cost of innovating have lead to the situation in which ever fewer organizations are able or willing to do all product development internally. The ability to innovate is, nevertheless, a key source of competitive advantage for today's firms. (Bader, 2008) Moreover, the share of internationally conducted research and development (R&D) operations has been rising since the 1960's, as multinational companies have invested in R&D facilities outside their home countries (Kuemmerle, 1999). In addition to having captive R&D units in various locations, firms have increasingly begun to rely on outside providers for many product development operations. Therefore, offshore outsourcing¹ of R&D operations seems to have become an interesting and promising possibility for firms (Carson, 2007; Khan and Fitzgerald, 2004; Quelin and Duhamel, 2003), and hence its importance is only likely to rise in the near future. The emergence of, for example, India and China as potential locations for a wide variety of business operations has lead many companies to reconsider how to organise the operations. The possibility of lowering cost levels, improving efficiency and gaining access to valuable external resources and capabilities are attracting numerous firms from the most advanced countries of the world to outsource and offshore their operations to emerging countries (Jahns, Hartmann, and Bals, 2006).

Outsourcing of business operations that are close to the core of a company is, however, an ambiguous issue. It can entail great benefits and possibilities to prosper

¹ The terms are defined here as follows: **outsourcing** entails the transfer of the responsibility for (i.e. the ownership of) an activity to an external business partner (a provider). In **offshore outsourcing** the business partner is located on another continent than the outsourcing company, usually a low-cost location. **Offshoring** refers to the transfer of a company's internal operations to a foreign location (i.e. setting up captive units in offshore locations). (Gilley and Rasheed, 2000; Jahns, Hartmann, and Bals, 2006; Lacity and Hirschheim, 1993; Li, Liu, Li, and Wu, 2008; Monczka, Markham, Carter, Blascovich, and Slaight, 2005; Quelin and Duhamel, 2003)

when implemented correctly. Nevertheless, there are numerous severe risks that can be realized. (Dove, 1999; Fitzgerald, 2003; Quinn, 2000) When the outsourcing happens in an emerging country context, it becomes even more ambiguous. This is because it involves the transfer of knowledge-intensive operations outside the firm boundaries, and from a developed country, the outsourcer's home country, to an emerging country (the host country).

This paper discusses the paradoxical issues in outsourcing product development operations to emerging country providers. The aim is to analyse the controversies related to this operation mode, and thus to shed light on the factors that make this kind of paradoxical business operation possible. In section 2, outsourcing as a means of accessing external resources and capabilities² and the outsourcing of knowledge-intensive operations are discussed. This is followed by the analysis of the controversies on national as well as on the firm level. The discussion ends with theory-based propositions for future empirical research.

2. Outsourcing and knowledge

In the era of heightened importance of knowledge (Miller, 1999), it is critical for companies to possess or have an access to the capabilities that serving their customers necessitates. Since firms have only limited resources (Barney, 1991; Grant, 1991; Peteraf, 1993; Wernerfelt, 1984), and also their capabilities are limited (Barney, 1999; Song and Shin, 2008), they need to find ways of complementing their internal knowledge and skills so that they will have the ability to serve their customers.

² Capability is here defined as a cluster of know-how assets. Usually these include discrete business-level organisational processes that are fundamental to running the business as well as generalised organisational skills. Capabilities are often quite durable and they are supported by routines and generally reside within a business function. (Teece, 2000, 24)

Completing firm capabilities with external ones is, nevertheless, quite a challenge. On one hand, it is very important to protect ones own knowledge assets to secure that competitors do not gain unintended benefits from the knowledge created by certain company (Lu, Louis Y. Y., 2007). On the other hand, open innovation and other open approaches to product development have been argued to be viable solutions for firms in various industries for enhancing their competitiveness (Chesbrough and Crowther, 2006; West and Gallagher, 2006). These two views seem quite opposite, and hence it is challenging for any company to determine what is the level of intellectual property protection their operations demand and how much should they open their operations to others in the hope of gaining efficiency and synergies. In the following, outsourcing of R&D³ operations as a means of accessing external capabilities is discussed in more detail.

2.1 Outsourcing as a means of accessing external resources & capabilities

Faced with technological changes that alter the capabilities needed for performing certain operations, firms can be seen to have two alternatives if they wish to stay in the business: they can develop the capability internally, or they can acquire an access to the capability of another organisation (Barney, 1999; Chi, 1994). Developing capabilities is often quite costly. In fact, it is considerably costly when the capability is based on historical conditions that do not exist any longer, on learning by doing, (i.e. is path dependent) or the actions needed are not fully known. In addition, social complexity of the capability makes it even more costly to develop (Barney, 1999; cf. Freiling, 2004).

³ R&D operations are in this paper understood so that they encompass all product development activities, and thus R&D and product development are used as synonyms

Acquiring access to capabilities, on the other hand, can be done in alternative ways. One can acquire a firm that possesses the capabilities in question, or one can cooperate with other firms to gain access to the needed capabilities (Barney, 1999; Ouyang, 2008). Acquisitions, however, have been reported to have even negative impacts on innovation, since they may lead to lower R&D investments, in addition to which, they may discourage innovativeness in the organisation. (Hitt, Hoskisson, Ireland, and Harrison, 1991)

Since developing capabilities from the scratch and acquiring firms with the specific capabilities are very time consuming and costly, cooperating with business partners to gain access to certain capabilities and know-how is, especially in the current, increasingly volatile business environment, viable alternative for many firms. There are various possibilities for organising this. The alternatives range from arm's length relationships, such as licensing, through outsourcing relationships to non-equity alliances and joint ventures. Each of these has strengths and weaknesses, and thus they suit different situations. It seems that the better the firm is able to internalise new knowledge, the more likely it is to prefer the more interactive modes of technology sourcing (Ouyang, 2008).

Outsourcing, which refers to the purchase of services provided with the resources or capabilities of an external provider, seems to be a feasible alternative for accessing the business partner's capabilities (Chi, 1994; Zollo and Winter, 2002). The outsourcer must, though, have absorptive capacity so that it can derive benefits and learn from the services provided by its business partner. Having absorptive capacity is all about taking new knowledge in and associating it with existing company knowledge. (Cohen and Levinthal, 1990; Mol, 2005) A firm should, thus, have certain level of prior knowledge on the area so that it will be able to make full use of the new

knowledge. Outsourcing product development operations is, thus considerably more challenging than purely acquiring external technologies; the level of knowledge needed is much higher (cf. Mason, Beltramo, and Paul, 2004).

Moreover, Kotabe et al. (2008, pp. 81) argue that firms should strive for having the ability to maintain and develop their capabilities so that they are able to sustain their competitiveness with regard to competitors. This however, may turn out to be quite difficult if the firm is outsourcing its operations internationally, since it may not be able to derive enough value from the international supplier relations. Therefore, firms should not become too dependent on outsourcing, but maintain sufficient level of capabilities in-house. (Kotabe, Mol, and Ketkar, 2008) Outsourcing, thus, cannot involve the whole product development function, but it should focus on adding to the internal operations (cf. Chesbrough and Crowther, 2006).

Outsourcing as an operation mode can be both a source of cost savings as well as a way to acquire know-how for a firm (Kotabe, Mol, and Ketkar, 2008). Nevertheless, there are also circumstances under which outsourcing can lead to loss and destruction of capabilities. Therefore, it is essential to consider the future value of the operations, not just the current cost reduction possibilities. (Kotabe, Mol, and Ketkar, 2008) This would seem to be particularly important with regard to product development outsourcing. It is essential for firms considering R&D offshore outsourcing to examine their current capabilities as well as the desired future capabilities. Even though anticipating the future is not easy, firms should do their best to project the direction to which they are to take their core operations and which capabilities that necessitates.

The significance of trading knowledge seems to be rising (Bessant, Birkinshaw, Delbridge, Griffith, Haskel, and Neely, 2008), which confirms that acquiring

knowledge from a business partner is possible. Its popularity has been rising very slowly due to various problems that arise from the special characteristics of knowledge as a target of an exchange (Hayek, 1945; Levin, Klevorick, Nelson, and Winter, 1987; Teece, 1981). Nonetheless, it could very well be that the pace keeps on increasing since the practices for trading even tacit knowledge are developing all the time, as the firms are, based on their past experiences, further refining the practices.

It has been noted that firms are actually tapping into external resources in all phases of the product development process, beginning from initial idea all the way to the commercialization of the product. Quite few companies, though, have developed a strategy for utilizing external sources in R&D and thus only very a few firms can be said to be managing holistically their portfolio of innovation sources (Linder, Järvenpää, and Davenport, 2003) . Thus, firms would seem to have a lot to learn in this area, and that is why examining the topic further is very important. Outsourcing, i.e. the change from make to buy, necessitates clear strategy and thorough assessment of the firm's strengths and weaknesses as well as the objectives (Doig, Ritter, Speckhals, and Woolson, 2001). If a company does not have holistic approach to innovation sourcing, it is not likely to be able to leverage organizational learning and hence, the lessons learned in the sourcing relationships are not utilized in the future relationships. In addition, this kind of an ad hoc approach to the innovation sourcing increases the risk of unintended transfer of knowledge, i.e. knowledge leakage. (Linder, Järvenpää, and Davenport, 2003)

Firms have boundaries, which distinguish them from the surrounding world. The boundaries can be of varying thickness and thus variably permeable. This has an influence on how easily and effectively e.g. resources can be transferred across organisations. Usually the boundaries between two firms are semi-permeable, which

means that critical resources are protected, but less critical ones may be allowed to permeate the boundaries. In other words, it can be argued that firm boundaries are open but strategically monitored. (Freiling, 2004) The open innovation approach, which implies increasingly permeable boundaries, has spread beyond high-tech industries. Yet, on a larger scale it remains quite limited. Nonetheless, firms are increasingly turning to inbound open innovation, i.e. acquiring technologies from external partners, in striving for growth in products or in revenues. (Chesbrough and Crowther, 2006) It has even been argued that firms should begin to have increasingly open business models, i.e. to utilize external sources of e.g. technologies more efficiently, and to cooperate with partners also in bringing products to the market (Chesbrough, 2007). Hence, there appears to be a case for outsourcing as a means of accessing external resources and capabilities; it may even be necessary in some fields. Nevertheless, it is crucial that the outsourcer has a well-thought strategy in place for outsourcing, since outsourcing is never an end in itself, but an instrument for achieving various goals (Doig, Ritter, Speckhals, and Woolson, 2001). In the following section, the discussion moves on to the outsourcing of knowledge-intensive operations, especially in an international context.

2.2 International outsourcing of knowledge-intensive operations

Outsourcing knowledge work, which actually became trendy in R&D management in the 1990's (Bader, 2008), has been argued to have become a realistic alternative for organising various operations largely due to technological developments that enhance world-wide communications. While, it at the same time, is acknowledged (even by the very same authors) that the possession of knowledge has always been, and continues to be, an important source of organisational strength. (Gavious and

Rabinowitz, 2003) To be able to find some clarification to this dilemma, it has been argued that there must be different categories of knowledge; some are critical to the core operations, some are strategically important and the rest are not that crucial. Different areas of knowledge have, thus, different roles in the corporate operations. Outsourcing should touch only part of the knowledge-intensive operations so that the firm does not lose its competitive edge.

Due to increasing reliance on external sources of knowledge as well as the fact that the amount of knowledge needed for maintaining and improving company competitiveness keeps on growing, the importance of knowledge management is rising (Gavious and Rabinowitz, 2003). In general, firms need to consider what their knowledge needs are and which sources they will use to gain access to the necessary knowledge, whether internal or external. (Gavious and Rabinowitz, 2003)

In addition to the risks mentioned above, there are also other possible downsides to the offshore outsourcing of R&D operations (see e.g. Paju, 2007 for discussion on risks and rewards) and some companies have felt very strongly about R&D outsourcing being impossible for them (see e.g. Dove, 1999). Despite the rapid development of communications technology, geographical and cultural distances cannot always be overcome (Morgan, 2004). It seems that the complexity of the project at hand has decisive importance when it comes to the need for geographical proximity; the more complex the tasks are, and the more tacit the knowledge involved is, the closer the interaction needs to be (Morgan, 2004). Furthermore, outsourcing of R&D operations may be inhibited by the lack of trust on external providers and their ability to meet the expectations (for example in terms of quality). (Dove, 1999)

Companies outsourcing product development and acquiring technologies from external partners face, furthermore, various challenges in bringing the technologies

into use within their own organisation. For example, resistance to accepting technologies can result from the fact that those have not been developed internally, i.e. the not-invented –here syndrome (Chesbrough and Crowther, 2006)⁴. This has been found to occur also in more recent research (Chesbrough and Crowther, 2006; Linder, Järvenpää, and Davenport, 2003; West and Gallagher, 2006) . In addition, there may appear problems in retaining internal motivation and commitment long enough for the benefits of the technology to be realized (Chesbrough and Crowther, 2006). Therefore, acquiring external technologies can be very challenging, and as argued above, outsourced product development and deriving sufficient value from the outsourced operations, is quite a challenge.

Multinationals have been found to be more prone to source capabilities and technologies from locations where the capability level is higher than in their home country (Song and Shin, 2008). This argument can be seen to conflict with the idea of offshore outsourcing of knowledge-intensive operations. In general, the capability level in the emerging countries, to which the term offshore usually refers, is somewhat lower than that in the home country of the outsourcing company. For example in India, the traditions in scientific research are rather long in some fields, but corporate R&D operations have only recently begun to grow (Bound, Leadbeater, Miller, and Wilsdon, 2006). Hence, it seems contradictory that operations can be outsourced into these kinds of locations. How come is it reasonable then?

R&D operations can be divided into home-base exploiting and home-base augmenting operations. The first ones build on the research done at the company home country, i.e. exploits the firm's existing research capabilities. The latter type, then again, adds to the capabilities of the home country R&D function. (Kuemmerle, 1999; see also

⁴ Original source: Katz, R and Allen, T. (1985) Organizational issues in the introduction of new technologies. In: *The management of productivity and technology in manufacturing*, ed by Kleindorfer, Paul R. Plenum Press: New York.

March, 1991) The selection of the location for the operations can be seen to be largely determined by the goals set for the operations, whether internal or outsourced. It seems that emerging countries could serve as locations for exploiting the product development done at the home country through adapting the products to the local market (Knott, 2002; Mariani, 2002). Nevertheless, it is also possible that the emerging country locations serve as the basis for augmenting the home based research and development work. There may be some special, location-bound, know-how in the target country or region, which makes the location attractive. Therefore, also various emerging country locations can be seen to offer some capabilities or knowledge that is not available elsewhere. (cf. Mariani, 2002) Moreover, the resources available in the location may be superior, in terms of e.g. costs or quality, compared to alternative locations.

Finally, there are basically two different ways of approaching the connections between product development and outsourcing. On one hand, from the viewpoint of transaction cost economics, it seems that R&D intensity discourages outsourcing. The cost of organising exchange of knowledge, can be very high, and thus performing the operations internally may result in lower transaction costs. In addition, there is the threat of opportunism of the business partner, which discourages R&D outsourcing. (Mol, 2005) On the other hand, efficiency gains through outsourcing non-core R&D operations can be seen to lead to lower costs and hence outsourcing may be seen as a viable alternative (Zhao and Calantone, 2003). From the relational point of view, it can be argued that R&D intensity, in fact, encourages outsourcing. This argument is based on the fact that the amount of knowledge needed keeps on expanding and hence firms need to increasingly also utilise external sources of know-how. (Mol, 2005) Also the resource-based approach supports this view. Gaining access to “best-in-

world” resources and capabilities through outsourcing R&D supports the outsourcing of the operations (Zhao and Calantone, 2003).

3. Ambiguous aspects in product development offshore outsourcing

It is a fact that the cost level, in general, is relatively high in developed countries. Thus the firms operating there rarely can compete with prices. Especially the production costs are considerably higher in the developed countries than in the emerging and developing countries. Thus, the firms located in the developed countries naturally focus more on knowledge-intensive operations: creation of new knowledge, technology development etc. Hence, product development function is at the very core of most of these firms (Brown and Eisenhardt, 1995, pp. 374).

It has long been argued that the tasks incorporating the core capabilities of the firm should be performed internally and the ones that are not strategically critical or in which the firm has no specific capabilities can, or even should be outsourced (Prahalad and Hamel, 1990; Zhao and Calantone, 2003). Outsourcing R&D operations, nonetheless, means interfering with operations that are very close to the core, and thus also perhaps risking the firm specific competitive advantage by exposing critical operations to external parties. As offshore countries, which are mainly emerging countries, have not traditionally been viewed as ideal locations for knowledge-intensive operations, and as the outsourcing of very close to the core operations has not been seen to be questionable, this seems to be a rather absurd operation mode.

In addition to this obviously controversial situation within the firm, also numerous societal issues are involved in offshore R&D outsourcing (domestic job loss, national competitiveness etc.) Furthermore, intellectual property rights issues are very

important in this context, since the level of protection of knowledge assets has been lower in the emerging countries than in the developed countries. In the following, both the national level, as well as the firm level, aspects of this paradox are discussed in more detail.

3.1 National level considerations

Various societal issues relate to the product development offshore outsourcing in the home country of the outsourcing firm. An important aspect in international outsourcing relates to “the hollowing of corporations”. The concept of Hollow Corporation was brought up in business magazines in the mid 1980’s (see e.g. Jonas, 1986; Pastin and Harrison, 1987). The point in the discussion is that outsourcing of various, mainly manufacturing operations can lead to the hollowing of a firm. This means that the firm is not producing anything itself, but it focuses on marketing and perhaps also developing the products and services. (Jonas, 1986) The hollowing of a corporation was feared to lead to the loss of competitiveness on the firm level, but above all, on the national level (Barney, 1999; Jonas, 1986). There can be found similarities between the outsourcing wave in manufacturing that caused these concerns and the current wave of outsourcing knowledge-intensive, close to the core, operations.

The loss of knowledge-based competitiveness has raised discussion, for example, in the United Kingdom. There was, quite recently, a special report in the Business Strategy Review (vol. 19, no. 1) on “Competing on Knowledge”. The authors argue that instead of competing on low costs, the developed country companies must put their efforts on competing via adding value (Bessant, Birkinshaw, Delbridge, Griffith, Haskel, and Neely, 2008). This means focusing on higher order operations, such as

product development. The authors argue that this can be achieved through developing the corporate knowledge base; not only by creating new knowledge, but also by capturing new ways of utilising existing knowledge (cf. Bessant, Birkinshaw, Delbridge, Griffith, Haskel, and Neely, 2008). It can, thus, be argued that the future competitiveness of developed world firms, and hence also the nations derives from finding innovative ways of utilising knowledge, no matter where or by whom it is created (Drejer and Sørensen, 2002; Lorenzoni and Lipparini, 1999; Møller, Johansen, and Boer, 2003) . The new core is in the ability to coordinate versatile business networks and to combine existing knowledge in new ways for new purposes. Hence, it has been argued that the role of corporate R&D function is changing from developing of technologies into scanning and adopting externally developed technologies (Linder, Järvenpää, and Davenport, 2003; Nambisan and Sawhney, 2007) .

There can also be found some neutral or even positive aspects in the issue. Population is ageing in the majority of the most developed countries, and thus the countries may face, and some are already facing, shortage of labour. The lack of knowledgeable and educated employees is driving companies to seek for the talent in other countries. (Hyvönen, 2008) Therefore, the movement of jobs from the outsourcing firm's home country to an emerging country does not necessarily have to increase the unemployment rates. Instead, it may be necessary for the companies to be able to find competent people to do the job.

International outsourcing of any operations naturally has effects also in the target country. The outsourcing of product development operations to an emerging country provider creates business for the provider and thus enables it to employ people. Thus it also creates incomes for the people and hence enhances development. Furthermore,

there is also the possibility of spillovers; for example, new businesses can be created as spin-offs from the original provider, as the employees gain know-how in performing the outsourced product development operations (Meyer, 2004).

Periods of rapid technological change, on national and even global level, require special response from companies. Firms accommodated to deal with the incremental changes may not be suited at all to deal with discontinuous, rapid change. (Bessant, Birkinshaw, Delbridge, Griffith, Haskel, and Neely, 2008) This is why and where outsourcing of e.g. product development operations can be very useful and helpful for a firm. Outsourcing can be a means of coping with a rapid change which necessitates such capabilities that the firm does not have (Pisano, 1990). This leads the discussion to the firm-level.

3.2 Firm-level issues

The national level and the firm-level issues are in a way two sides of the same coin; competitiveness of nations is built through the competitiveness of the firms operating in the economy (cf. Porter, 1990). Product development is one of the most essential functions for many firms. For example, in the pharmaceuticals industry the competitiveness of the firms lies on innovation (Mehta and Peters, 2007), which means that product development is one of the core capabilities. Therefore, outsourcing of these operations happens possibly at the cost of internal capabilities (cf. Kotabe, Mol, and Ketkar, 2008). Outsourcing product development, furthermore, increases the complexity of R&D management. (Mehta and Peters, 2007) It seems also that the intra-firm diffusion of knowledge is growing in importance. It is necessary for firms to effectively exploit their innovation potential, while outsourcing some of the product development operations. (Pitt and Clarke, 1999)

Firms generally claim to outsource only non-critical parts of their product development. Nevertheless, the outsourcer usually exchanges information on how to perform the outsourced task with the provider. Thus, the provider gains insights on e.g. the outsourcer's proven practices. (Mehta and Peters, 2007) Hence, also less critical operations may lead to the transfer of strategically important knowledge.

Dankbaar (2007) has examined the effects offshore outsourcing of manufacturing operations can have on the innovative capabilities of a firm. Even though the focus is on manufacturing operations, his study gives valuable insights to the effects of international outsourcing in general. As manufacturing operations are outsourced, the firm loses knowledge and capabilities related to those operations. Hence, it becomes more difficult for it to assess the abilities of the suppliers as well as to integrate the necessary manufacturing know-how into product development. (Dankbaar, 2007) The effect is likely to be amplified in the case of knowledge-intensive operations, due to the uncertainties related to assessing the value of knowledge in advance (Levin, Klevorick, Nelson, and Winter, 1987; Wiig, de Hoog, and van der Spek, Rob, 1997). Hence, outsourcing of R&D operations may lead to the loss of certain important capabilities and hence to the loss of competitiveness through losing the ability to assess externally developed products and technologies. It is, thus, very important for companies to maintain certain level of know-how on the operations in-house so that they have the ability to evaluate external innovations as well as the needed absorptive capacity for integrating those external innovations into their own processes (cf. Cohen and Levinthal, 1990).

The possibility of partitioning R&D operations into smaller tasks that can be outsourced is related to the above discussion. It has been discovered that modular product design encourages outsourcing, especially if the components can be designed

and manufactured to a large extent independently, based on detailed specifications (cf. Dankbaar, 2007; see also Hätönen and Jantunen, 2007) Thus, it seems that one of the key issues in the ability to outsource product development internationally is the possibility of splitting the product into smaller pieces that can be managed and developed independently according to certain compatibility specifications. This can be seen to imply that the whole core of the firm is not actually exposed even though it would outsource some of the even critical tasks. It seems to be possible to outsource very selectively and hence to protect those operations that are considered the most risky or sensitive in this context.

One of the major issues in internationally outsourced R&D is overcoming the physical distance. It has been observed that a distance of over 30 meters has a powerful influence on communication (Richtnér and Rognes, 2008)⁵. Based on this finding, international outsourcing of R&D should not be a reasonable alternative. This finding, however, is already more than 20 years old, and communications technology has developed enormously since. Nonetheless, also more recent studies have discovered that face-to-face communication is clearly more efficient than virtual communication. When the face-to-face contact is missing, the cohesion of the communicating group as well as the relational ties between them are weak, and thus hinder effective communication. (Chiesa, Manzini, and Pizzurno, 2004; Linder, Järvenpää, and Davenport, 2003; Richtnér and Rognes, 2008; Warkentin, Sayeed, and Hightower, 1997) Despite technological developments, communicating across distance seems to be a challenge.

Companies seem to solve this problem, at least partially, through organizing the operations so that most of the knowledge is centered in one place. Geographically

⁵ Original source: Allen, T.J. (1984) *Managing the Flow of Technology*. Cambridge, MA: MIT Press.

dispersed R&D projects have been found to be mainly asymmetrical in the sense that the responsibility for the project and the coordination of the project are in one place. The other units perform sub-tasks, i.e. contribute to the project according to the instructions from the coordinating unit. (Richtnér and Rognes, 2008)

4. Propositions for future empirical research

The recent discussion on open innovations has shown that the era of relying exclusively on internal sources of know-how is over. Innovating with outside partners is becoming increasingly important, especially for small and medium sized companies, since they have to survive with very limited resources (Rigby and Zook, 2002). Outsourcing of close to the core operations could, nevertheless, be argued to be one way of hollowing of a corporation, as mentioned earlier. On the other hand, it can also be argued that outsourcing of these operations enables the firm to concentrate on other operations and thus incorporate other kinds of capabilities. In a way, this can be seen as evolution of the companies as they transform from one set of specialisation and capabilities towards the next. The figure below summarises the discussion in the thus far.

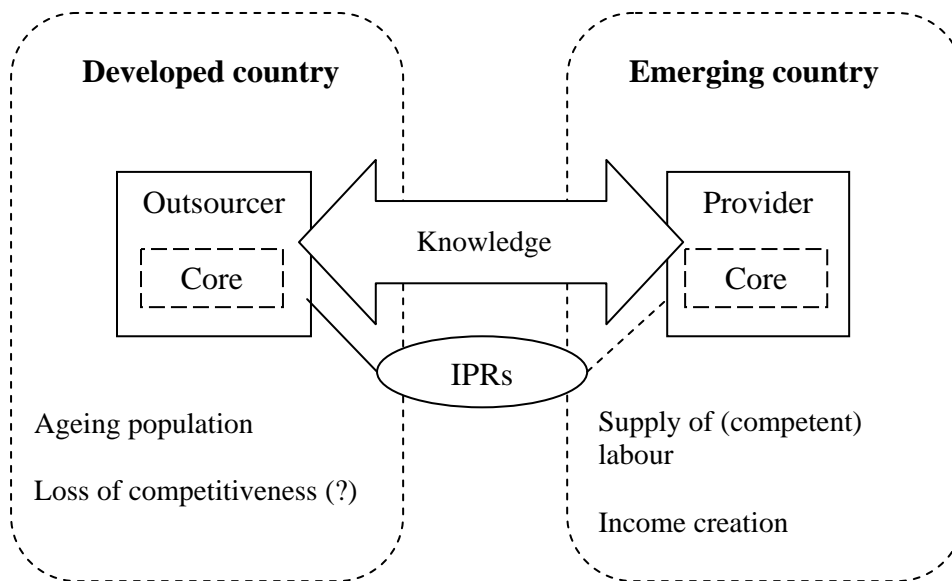


Figure 1. Paradoxical aspects of R&D offshore outsourcing phenomenon

As it can be seen in the figure, there are numerous issues that can be seen controversial in R&D offshore outsourcing. The main source of tension can be seen to be the context in which the outsourcing takes place, i.e. the developed country versus an emerging offshore country. Second major issue is the tension with regard to outsourcing tasks and operations that are very close to the core of the company. In addition, the distance between the firms, both physical and mental distance as well as the distance in the level of capabilities can be seen to cause some friction. Finally, the intellectual property rights (IPRs) issues may be complicated.

As it has been discussed above, the offshore outsourcing of product development operations is quite a versatile phenomenon. Strong arguments can be set both for and against it. Nonetheless, the world rarely is purely black or white. This seems to be also the case with regard to offshore outsourcing of product development: many of the issues discussed have both positive and negative aspects and the difference between arguments is not always as straight forward as would appear at first glance.

The seemingly conflicting arguments may, and often do, have differing logic behind them. Thus, the differing reasoning on the issue leads to conflicting conclusions. One should, therefore be very careful when mixing arguments and viewpoints from different fields or traditions. In addition, controversies may arise from mixing different levels of analysis. If different levels are paralleled without careful consideration, the conclusions may, again, be controversial. (Richtnér and Rognes, 2008)

The open innovation approaches can be seen as ways of importing new ideas to the firm's product development process. The risks involved, as discussed above, are real, but manageable. (Rigby and Zook, 2002) Open approaches to product development are most valuable when the intensity of innovation in the industry is high, the markets are volatile and the economies of innovation are low. Moreover, largely cumulative nature of innovation and their application across industries speaks for open approaches. (Rigby and Zook, 2002) This implies that different kinds of approaches and strategies are needed for innovation in different times (Bessant et al., 2008; Rigby and Zook, 2002). It has, actually, been argued that in all kinds of industries, trading in knowledge will in the 21st century become as important as trading in goods and services has been in previous centuries (Bessant et al., 2008).

Since the creation of new knowledge is not anymore enough for developed country firms to maintain their competitive edge, it can be argued that governing and controlling knowledge flows is the current and future source of competitive edge (Bessant et al., 2008). Thus, the outsourcing of parts of knowledge creation does not have to mean the loss of competitive edge, or a threat to the core of the firm capabilities. Instead, the very core of these knowledge outsourcing firms lies in operations that scan external developments, integrate knowledge from various

sources, control knowledge flows and capture new kind of value from external capabilities (Engardio, Einhorn, Kripalani, Reinhardt, Nussbaum, and Burrows, 2005). The input of the management is crucial in this; the managers need to recognise new knowledge and have the ability to integrate it with previous knowledge, as well as to exploit the newly acquired knowledge (cf. Pitt and Clarke, 1999). Hence, the first proposition:

Proposition 1: The role of corporate product development function is changing from internal product development towards scanning, absorbing and adopting external developments and technologies.

Firms will be, and are already, acquiring and utilising knowledge created by other organisations, and thus maintaining crucial knowledge in-house is very important. I.e. the protection of knowledge areas that are at the very core of its capabilities is vital. Therefore, the firm must be able to clearly separate the tasks for outsourcing from the ones performed completely internally (cf. Dankbaar, 2007; Hätonen and Jantunen, 2007). This leads to the second proposition:

Proposition 2: It is possible to outsource operations and tasks very selectively and thus to protect the most critical know-how of the firm while outsourcing very close to the core operations.

The emphasis of firms is shifting from in-house innovations to the ability towards bring new products to the markets, no matter who has developed them (Mol, 2005). This can also be seen to be related to dynamic capabilities, since the ability to bring new products to the market necessitates the ability to renew and to respond to and anticipate changes in the business environment (cf. Teece, 2000). Therefore, competitive advantage cannot any longer be based on static issues, such as the capability of producing certain product, but firms must develop their capabilities

towards continuous development and renewal. They must figure out with which capabilities they can respond to needs of their existing and potential customers.

Finally, it can be concluded that the knowledge gap between the developed and the emerging countries appears to be gradually closing as the emerging countries are finding ways to utilise their huge potential in knowledge-intensive businesses (Bound, Leadbeater, Miller, and Wilsdon, 2006). Therefore, performing knowledge-intensive operations there can well be justified.

References

Bader M.A. (2008). Managing intellectual property in inter-firm R&D collaborations in knowledge-intensive industries. *International Journal of Technology Management*, 41/3/4, 311-335.

Barney J. (1999). How a firm's capabilities effect boundary decisions. *Sloan Management Review*, 40/3, 137-145.

Barney J. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*; Bloomington, 17/1, 99-120.

Bessant J., Birkinshaw J., Delbridge R., Griffith R., Haskel J., & Neely A. (2008). Special report: Competing on knowledge. *Business Strategy Review*, 19/1, 73-89.

Bound K., Leadbeater C., Miller P., & Wilsdon J. (2006). The new geography of innovation: India, Finland, science and technology. , *Sitra Reports* 71.

Carson S. (2007). When to Give Up Control of Outsourced New Product Development. *Journal of Marketing*, 71/1, 49-66.

Chesbrough H.W. (2007). Why companies should have open business models. *MIT Sloan Management Review*, 48/2, 22-28.

Chesbrough H., & Crowther A.K. (2006). Beyond high tech: early adopters of open innovation in other industries. *RD Management*, 36/3, 229-236.

Chi T. (1994). Trading in strategic resources: necessary conditions, transaction cost problems, and choice of exchange structure. *Strategic Management Journal*, 15/4, 271-290.

Chiesa V., Manzini R., & Pizzurno E. (2004). The externalisation of R&D activities and the growing market of product development services. *R&D Management*, 34/1, 65-75.

Cohen W.M., & Levinthal D.A. (1990). Absorptive Capacity: A New Perspective On Learning And Innovation. *Administrative Science Quarterly*, 35/1, 128-152.

Dankbaar B. (2007). Global sourcing and innovation: the consequences of losing both organizational and geographical proximity. *European Planning Studies*, 15/2, 271-288.

Doig S.J., Ritter R.C., Speckhals K., & Woolson D. (2001). Has outsourcing gone too far? *The McKinsey Quarterly*; New York/4, 24-37.

Dove R. (1999). Outsourcing knowledge work--Why not? *Automotive Manufacturing & Production*, 111/10, 16-17.

Drejer A., & Sørensen S. (2002). Succeeding with sourcing of competencies in technology-intensive industries. *Benchmarking*, 9/4, 388-408.

Engardio P., Einhorn B., Kripalani M., Reinhardt A., Nussbaum B., & Burrows P. (2005). Outsourcing innovation. *Business Week*/3925, 84-94.

Fitzgerald M. (2003). At Risk Offshore ; U.S. companies outsourcing their software development offshore can get stung by industrial espionage and poor intellectual property safeguards. *CIO*; Framingham, 17/4, 78.

Freiling J. (2004). A competence-based theory of the firm. *Management Revue*, 15/1, 27-52.

Gavious A., & Rabinowitz G. (2003). Optimal knowledge outsourcing model. *Omega*, 31/6, 451-457.

Gilley K.M., & Rasheed A. (2000). Making more by doing less: an analysis of outsourcing and its effects on firm performance. *Journal of Management*, 26/4, 763-790.

Grant R.M. (1991). The resource-based theory of competitive advantage: implications for strategy formulation. *California Management Review*, 33/3, 114-135.

Hätönen J., & Jantunen S. (2007). Modularity and outsourcing in new product development of software.

Hayek F.A. (1945). The Use of Knowledge in Society. *The American Economic Review*, 35/4, 519-530.

Hitt M.A., Hoskisson R.E., Ireland R.D., & Harrison J.S. (1991). Effects of acquisitions on R&D inputs and outputs. *Academy of Management Journal*, 34/3, 693-706.

Hyvönen P. (2008). Osaajat loppuivat kesken. *Prima*/3, 50-57.

Jahns C., Hartmann E., & Bals L. (2006). Offshoring: Dimensions and diffusion of a new business concept. *Journal of Purchasing and Supply Management*, 12/4, 218-231.

- Jonas N. (1986). The hollow corporation. *Business Week*/2935, 57-59.
- Khan N., & Fitzgerald G. (2004). Dimensions of Offshore Outsourcing Business Models. *Journal of Information Technology Cases and Applications*, 6/3, 35-50.
- Knott A.M. (2002) Exploration and exploitation as complements. In C.W. Choo and N. Bontis, (eds) *The Strategic Management of Intellectual Capital and Organizational Knowledge*. Oxford: Oxford University Press, 339-358.
- Kotabe M., Mol M.J., & Ketkar S. (2008). An evolutionary stage model of outsourcing and competence destruction: a triad comparison of the consumer electronics industry. *Management International Review*, 48/1, 65-93.
- Kuemmerle W. (1999). Foreign direct investment in industrial research in the pharmaceutical and electronics industries—results from a survey of multinational firms. *Research Policy*, 28/2-3, 179-193.
- Lacity M.C., & Hirschheim R. (1993). The information systems outsourcing bandwagon. *Sloan Management Review*, 35/1, 73-86.
- Levin R.C., Klevorick A.K., Nelson R.R., & Winter S.G. (1987). Appropriating the returns from industrial research and development. *Brookings Papers on Economic Activity*, 1987/Special Issue 3, 783-831.
- Li Y., Liu Y., Li M., & Wu H. (2008). Transformational Offshore Outsourcing: Empirical Evidence from Alliances in China. *Journal of Operations Management*, 26/2, 257-274.
- Linder J.C., Järvenpää S., & Davenport T.H. (2003). Toward an innovation sourcing strategy. *MIT Sloan Management Review*, 44/4, 43-49.
- Lorenzoni G., & Lipparini A. (1999). The leveraging of interfirm relationships as a distinctive organizational capability: a longitudinal study. *Strategic Management Journal*, 20/4, 317-338.
- Lu, Louis Y. Y. (2007). Protecting intellectual property rights. *Research Technology Management*, 50/2, 51-56.
- March J.G. (1991). Exploration and exploitation in organizational learning. *Organization Science*, 2/1, 71-87.
- Mariani M. (2002). Next to Production or to Technological Clusters? The Economics and Management of R&D Location. *Journal of Management & Governance*, 6/2, 131-152.

- Mason G., Beltramo J., & Paul J. (2004). External knowledge sourcing in different national settings: a comparison of electronics establishments in Britain and France. *Research Policy*, 33/1, 53-72.
- Mehta S., & Peters L.S. (2007). Outsourcing a Core Competency. *Research Technology Management*, 50/3, 28-34.
- Meyer K.E. (2004). Perspectives on multinational enterprises in emerging economies. *Journal of International Business Studies*, 35/4, 259-276.
- Miller W. (1999). Building the ultimate resource. *Management Review*, 88/1, 42-45.
- Mol M.J. (2005). Does being R&D intensive still discourage outsourcing?: Evidence from Dutch manufacturing. *Research Policy*, 34/4, 571-582.
- Moller M.M., Johansen J., & Boer H. (2003). Managing buyer-supplier relationships and inter-organisational competence development. *Integrated Manufacturing Systems*, 14/4, 369-379.
- Monczka R., Markham W., Carter J., Blascovich J., & Slaight T. (2005). Outsourcing Strategically for Sustainable Competitive Advantage.
- Morgan K. (2004). The exaggerated death of geography: learning, proximity and territorial innovation systems. *Journal of Economic Geography*, 4/1, 3-21.
- Nambisan S., & Sawhney M. (2007). A Buyer's Guide to the Innovation Bazaar. *Harvard Business Review*, 85/6, 109-118.
- Ouyang H.S. (2008). Resources, absorptive capacity, and technology sourcing. *International Journal of Technology Management*, 41/1, 183-202.
- Paju T. (2007). Conceptual model of R&D offshore outsourcing. *Journal of Global Business and Technology*, 3/1, 49-61.
- Pastin M., & Harrison J. (1987). Ethical standards are difficult when a firm farms out much of its business. Social responsibility in the hollow corporation. *Business and Society Review*, 63/fall, 54-58.
- Peteraf M.A. (1993). The cornerstones of competitive advantage: a resource-based view. *Strategic Management Journal*, 14/3, 179-191.
- Pisano G.P. (1990). The R&D Boundaries Of The Firm: An Empirical Analysis. *Administrative Science Quarterly*, 35, 153-176.

Pitt M., & Clarke K. (1999). Competing on competence: A knowledge perspective on the management of strategic innovation. *Technology Analysis & Strategic Management*, 11/3, 301-316.

Porter M.E. (1990). The competitive advantage of nations. *Harvard Business Review*, 68/2, 73-93.

Prahalad C.K., & Hamel G. (1990). The core Competence of the Corporation. *Harvard Business Review*, 68/3, 79-91.

Quelin B., & Duhamel F. (2003). Bringing together strategic outsourcing and corporate strategy: outsourcing motives and risks. *European Management Journal*, 21/5, 647-661.

Quinn J.B. (2000). Outsourcing innovation: the new engine of growth. *MIT Sloan Management Review*, 41/4, 13-28.

Richtnér A., & Rognes J. (2008). Organizing R&D in a global environment: Increasing dispersed co-operation versus continuous centralization. *European Journal of Innovation Management*, 11/1, 125-141.

Rigby D., & Zook C. (2002). Open-market innovation. *Harvard Business Review*, 80/10, 80-89.

Song J., & Shin J. (2008). The paradox of technological capabilities: a study of knowledge sourcing from host countries of overseas R&D operations. *Journal of International Business Studies*, 39/2, 291-303.

Teece D. (1981). The market for know-how and the efficient international transfer of technology. *Annals of the Academy of Political and Social Science*, 458/November, 81-86.

Teece D.J. (2000) Managing intellectual capitalorganizational, strategic, and policy dimensions. New York: Oxford University Press.

Warkentin M.E., Sayeed L., & Hightower R. (1997). Virtual teams versus face-to-face teams: An exploratory study of a Web-based conference system. *Decision Sciences*, 28/4, 975-996.

Wernerfelt B. (1984). A resource-based view of the firm. *Strategic Management Journal*, 5/2, 171-180.

West J., & Gallagher S. (2006). Challenges of open innovation: the paradox of firm investment in open-source software. *R & D Management*, 36/3, 319-331.

Wiig K.M., de Hoog R., & van der Spek, Rob (1997). Supporting knowledge management: A selection of methods and techniques. *Expert Systems with Applications*, 13/1, 15-27.

Zhao Y., & Calantone R.J. (2003). The trend toward outsourcing in new product development: case studies in six firms. *International Journal of Innovation Management*, 7/1, 51-66.

Zollo M., & Winter S.G. (2002). Deliberate learning and the evolution of dynamic capabilities. *Organization Science*, 13/3, 339-351.