

Accumulating a Critical Mass of Resources to Gain a Favourable Position within a Life Sciences Network: The Case of Levodex.

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Work in Progress Paper for 18TH IMP Conference, University of Lugano

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Introduction:

This working paper centres on a small Irish start-up company called Levodex that is attempting to specialise in the production of specific forms of catalysts in a specialised field of organic chemistry. The main issue for this paper revolves the attempts of the firm to accumulate a critical mass of resources to establish a favourable network position. To give some semblance of coherence to what is to proceed this paper shall break down into three distinctive parts. The first part shall briefly appraise some literature centring on the themes of resources, the development of resources and the growth of the firm, and the idea of network positioning. Following from the case of Levodex shall be presented. Finally some concluding remarks shall be drawn.

Literature:

A major focus in the last twenty years, on exploring and explaining the strategies and actions of firms, has been upon resources and resource development. (Foss, 2002) Although there are numerous complementary and competing perspectives examining such areas as the accumulation, development and use of resources (for further elucidation see Foss, 1997, 2002) the perspective this paper wishes to take is that of the network perspective (for example see Hakansson and Snehota, 1995, Ford et al 1998, Hakansson and Waluszewski, 2002). Implicit to such a perspective is the key

issue of interaction whereby resources are accumulated, developed, and activated through the interaction of firms (Ford et al, 1998). Resources are not so much located within the firm but within the focal interfirm networks. (Gulati, 1999) Such a perspective further holds that resources are dependent upon the complex interaction between varying constellation of resources, patterns of activities and webs of actors where:

“Actors are defined as those who perform activities and/or control resources. In activities actors use certain resources to change other resources in various ways. Resources are means used by actors when they perform activities. Through these circular definitions a network of actors, a network of activities and a network of resources are related to one another.” (Hakansson and Johansson, 1994, as cited by Hakansson and Waluszewski, 2002, pp. 30).

With the stated focus of the paper much credence shall be given to the resource aspect of the ARA model of Hakansson and Snehota (1995), however to understand the use and accumulation of resources the aspects of actors and activities will necessarily be given some consideration.

Through the stated desire to concentrate on the attempt of a firm to accumulate sufficient resources to establish a network position an influential piece of work is Penrose's (1995) *Theory of the Growth of the Firm*. The main thrust of the argument circles around firms being seen to consist of pools of resources which are organised into administrative frameworks which in a way determine the types and amounts of services that can be provided. Such a perspective has certain congruence with the network perspective, although the network perspective on resources factors in direct and indirect interaction. However, an interesting aspect, as Garnsey (2002) notes, is Penrose's (1995) account of entrepreneurship and how it affects the growth of new ventures. Similar to one of the major themes of the work, much stock is placed upon the management function. From such a perspective emphasis is placed upon the competence of the entrepreneur and the imagination that they have to both mobilise and envision the inherited (which once again has resonance in the network perspective) internal resources they have and the resources needed to be able to connect them to the external opportunities in the market. As Penrose (1995) states:

“The selection of the relevant product markets is necessarily determined by the ‘inherited’ resources of the firm- the productive services it already has. This is true even in the extreme case of the prospective new firm with no resources at all other than the entrepreneur himself and what capital he can raise; the particular productive activities to be undertaken by such a firm must be chosen from among the alternatives suitable to the abilities, finance and preference of the entrepreneur.” (pp. 82)

Such a perspective has resonance within network studies and in the works of Witt (1998) and Loasby (1998). However, such a use of entrepreneurial ‘vision’ or ‘imagination’, as noted by Garnsey (2002), has its limitations in the sense that others need to be able to understand or have a similar vision to buy into the entrepreneurial conception. Similarly such a view is implicitly echoed in Witt (1998), and in Loasby (1998). An interest in this set of literature for this paper revolves around two central aspects. The first aspect is that the firm being briefly explored deals in the complicated field of the discovery of specialised scientific knowledge and secondly the firm is at the start-up stage and the pressing need is for an understanding of the entrepreneurial conception.

The final stream of literature that provides interest to this paper is in the area of market investments and market positioning. Dealing with the former first, Johanson and Mattsson (1985) extend and deepen the concept of long-term investment activity and its affect on positioning of a firm within a network structure. They distinguish between internal (production and marketing) assets and external (market) assets. Internal assets are assets that the firm has easy access to and greater control over, and investments in such assets are aimed towards the external (market) assets (Araujo and Easton, 2002). Market assets are the sum of the past activities of the firm “...but also embody the results of complementary and competitive investments by other firms.” (Araujo and Easton, 2002, pp.2). Similarly these assets “...also define the position and the role of the firm in the network in which it is embedded.”(Araujo and Easton, 2002, pp.2)

Following on from this the concept of positioning needs to be briefly explored. Although a central concept to many areas within management and marketing

literature, positioning from a network perspective takes into account the embeddedness and direct and indirect interaction of firms. Positioning, in a traditional network sense, is therefore understood by the function performed by the firm in relation to other firms in a focal net, the other actors the firm has contact with and the importance of the firm in the network. (Araujo and Easton, 2002, Mattsson, 1985)

Taking investment and position together what emerges, as noted by Johanson & Mattsson (1985) and Araujo & Easton (2002), is that the investments over the long term, both internal and external, help to provide the position of the firm. How this affects the case then is that because position is part of continuing investments and a long-term activity the problem that the firm has is to establish a position because they are only a recent start-up in a very complicated and opaque field. Therefore one of the problems that potentially faces the firm is the access to certain forms of knowledge and the initiation of suitable relationships.

In sum, the literature of interest is in firstly the perspective of resources as accounted for by the network perspective- where resources are activated through interaction and through actors and activities. Secondly, an interest lies in the Penrosian(1995) account of entrepreneurship but with the provision that the entrepreneurial imagination or vision must be understood in kind by the focal firm and other firms. Finally an interest lies in the area of network investment and positioning and the difficulty a firm faces in establishing a favourable location. A short case shall now follow.

Background to the Scientific Area:

Levodex is a small Irish start-up that is attempting to specialise in the patenting of intellectual property for the production of chiral catalysts that aids and enables the discovery process across a multitude of areas including pesticides, biochemicals, dyes and pharmaceuticals. The study of chiral chemistry involves the discovery and use of chemicals in single-handed form. In nature molecules often exist in mirror image form, but like your hands they are the same but different (i.e they are mirror images). How this affects for example pharmaceuticals is that a drug could contain molecules with both hands but with each hand having different properties and effects. An infamous example of this is Thalidomide (morning sickness drug) where the right hand of the drug relieved morning sickness while the left hand caused birth defects.

Therefore what is involved in chiral chemistry is either the discovery (natural or artificial) or separation of molecules into single-handed form. There are three forms- left, right and racemic (equal measure).

A surge of interest in chiral chemistry occurred in the nineties through the 1992 FDA ruling in the USA that pharmaceuticals drugs that are chiral have to be made in the three forms. Prior to this most chiral drugs had been made in a racemic mixture. Now though three forms have to be made and the one which displays the best therapeutic use, and least side effects, are the ones to be used, once the patent on any racemic drug has expired. Through this legislation a number of companies began specialising in chiral technology targeting large multi-national pharmaceutical companies whose racemic drugs were running out of patent. However, many racemic drugs have already been switched to their chiral form or else have stayed racemic (switching is only recommended if the equal measure is not as effective as the single-handed form). The impetus in the industry is now towards the discovery and creation of new chiral catalysts for either the creation of new drugs or the improvement of older pharmaceuticals.

The technologies to make chiral compounds for enabling products vary. These methods include manipulating enzymes, chromatography, chiral auxiliaries, resolution, and asymmetric synthesis. The newest form of chiral discovery, and which industry reports (for example BCC report 1999, D &MD report 2003) pin the future on, is asymmetric/chiral synthesis. What this form of technology does is to synthetically create chiral catalysts for industrial use.

Idea behind the Focal Firm:

The firm of interest, Levodex, is a small Irish start-up situated within an Irish University Incubator programme. The idea behind the firm is to discover chiral catalysts for industrial use to help enable the creation of new products, particularly within the pharmaceutical industry. What differentiates this firm from others operating within this realm is that they intend to industrialise the discovery process, where most discoveries had previously emerged from university laboratories and mostly by hand, using asymmetrical synthesis and adapting state of the art combinatorial technology. By doing this they hope to speed up the discovery process

and file for intellectual property rights. What is interesting about this is that this corresponds to Penrose's (1959) idea on entrepreneurship and also to Rosenberg's (1994) account of research and development in the US- where most emphasis is placed upon the development of processes.

Setting up the Business:

The company at present is made up of a recent Doctoral Graduate, who had the initial idea from a presentation he attended at a conference in 1998, his supervisor and a recent MBA graduate who has commercial experience in science and engineering. To make this idea feasible they applied to the university incubation programme in 2001 and were accepted under the provisions that they gave 15% of any future earnings to the university and employ an MBA graduate to head up the company. In accepting these terms they received facilities and funding for the operation and they applied and got further funding from Enterprise Ireland. Their present activities revolve around raising a substantial amount of capital to operationalise the idea.

Resources and Social Networks:

Although the company has access to a certain amount of seed capital and working facilities their main resources lie in the access to knowledge that they have and the contacts that they have acquired. The contacts that they have involve academic, business and government.

Academic:

The senior academic involved in the company has worked in this area for over twenty years and received his doctorate from a prestigious university in the States and then worked as an active researcher on a large project with a scientist who won the 2001 Nobel prize for chemistry. Through this active participation in this very specialised field the contacts that he has acquired span across universities in both Europe and the States. In utilising these social resources Levodex have put together a Scientific Advisory Board that consists of three of the leading scientists in this field, including the Nobel prize winner, two senior scientists in research in the pharmaceutical industry and a very well respected and senior Irish science academic. The use of this board is two-fold- firstly to enable the discovery process and secondly the use of the board to gain access to companies that require such solutions. Similarly, to

operationalise this idea they have begun to target research groups across European Universities to recruit doctoral graduates in this area. Interestingly, particularly with regards to the varying research groups, this in a way holds some similarities to the structural holes discussed by Burt (1992).

Business:

However, to be able to fully utilise this network of contacts to the full, substantial capital is needed. To raise this capital Levodex has been using sets of contacts provided by the University to pursue funding. They have been provided access to some of the prominent business members associated with the University to gain access to the community of venture capitalists in Ireland and the UK and also to prominent entrepreneurs in the Life Sciences in Ireland. An interesting aspect is the small and close venture capital industry in Ireland where "...the VC funds in Ireland are a mixture of high net worth individuals who have institutionalised their investing and then also more traditional VC funds... There are a lot of smaller funds as well like Pure Engines like you know 100 or 200 grand funds but we are out of that league. It ends up being a small number of guys who end up having funds of 10 or 30 million... to invest which is small because any of the Life Science funds in the UK they are all looking at funds of 500 to 900 million. So it's entirely different scales... of organisations and funds." Also because of the small size of the market each of the venture capitalists knows the other and also all the start-up companies looking for funding. Similarly through utilising business contacts they have had meetings and discussions with Pharmaceutical organisations that have shown an interest in potential research alliances in the future.

Government:

An interesting aspect to this case is the role of the government in promoting research in the Life Sciences in Ireland. The government has earmarked the Life Sciences and Information Technology as the areas for future investment in Ireland. What makes Levodex's case of particular interest is that they are trying to develop novel research in Ireland that, as one of the correspondents puts it, in Ireland it has previously all been about "...tweaking the process, not working out the process from day one... Their research isn't actually done here... they are really good at running process facilities but core research isn't done here." To try and rectify this situation the government has earmarked various schemes including the setting up of The Science Foundation of Ireland (SFI), which has been granted over 650 million euro to spend over the next

few years. To capitalise on this Levodex has used contacts in Enterprise Ireland to secure initial funding and has used contacts in the Science community to have contact and discussions with the SFI.

Present Activities:

At present the company are trying to accumulate sufficient monetary resources to create a position for themselves within this network. However certain problems and constraints have arisen constraining their ability to achieve this. The first major hurdle, as they perceive it is the nervousness of the market where they feel like they are "...getting blamed for the dotcom bubble, for the excesses of Enron, for the accounting malpractice's of Worldcom and the incompetence of Vivendi not even to mention what's going on with Élan."

The second constraint on their activities has been the problem of the validity of their idea

"... because you do become involved in ideas and one of the big problems scientists, engineers, technologists always have is that they fall in love with their ideas. This is wonderful, you fall in love with this wonderful chemistry in this instance and great chemistry very interesting, you can get very excited about it late at night but its not worth a hat of rabbits and a lot of technologies just aren't, it might be very interesting technology but does the market really want it." There are a few interesting facets to this- firstly use and value only arise through interaction and secondly the difference between, as seen in Rosenberg (1994), inventors and entrepreneurs.

Similarly, a third problem that has been faced by the company has been the valuation of chiral catalysts where through their peripheral role, newness, and complexity of their area of specialisation they have found it difficult to provide pricing structures for chiral catalysts. As one of the correspondents states "How do you value these things- it depends how goodly or badly it is needed". This has resonance with the work of Kogut(2000), some of the ideas of network studies with regard to learning and knowledge, and also with Gulati (1999) and access to knowledge in alliance formation. Another problem that has been faced has been getting across their idea to venture capitalists because of the specialised knowledge required to understand what they wish to achieve in any great detail. This has echoes in Garnsey (2002) on the limitations of Penrose's (1995) theories on entrepreneurship and implicitly mirrors the

ideas of network studies. A final problem has been the validation of their science, which because of their links within this specialised field it has been difficult at times to find independent verification.

Concluding Remarks:

This early working paper contains some issues of interest at an early stage of development. The firm *Levodex* have an idea that is a potential market maker and could change the discovery process for chiral catalysts, similar to Rosenberg's (1994) account of technological development in the US. Similarly, the active use of imagination and inherited resources (that is to say their extensive social networks and academic knowledge of chirality), a la Penrose, has brought them to the start-up phase. Similarly the utilisation of the social resources available to them has stirred interest in the investor community and already secured some initial funding.

However, certain constraints persist, of which some are inside their control and others outside. Firstly because the focal firm is a start-up and the complexity and novelty of what they are trying to do, it is difficult for potential investors and potential customers to both grasp (for the venture capitalists and certain private investors) as well decide upon the feasibility of the idea. This in some ways echoes both Garnsey (2002) and Rosenberg (1994). A similar problem resides in the length of time of their existence whereby the investments in internal and external assets has been very limited leading to a peripheral position within the network at best. Following on from this because they are peripherally involved in the network they do not have access to critical issues and demands that are emerging in their focal network, such as for example the valuation of potential discoveries.

To conclude, this working paper has very briefly explored the issues of resources, entrepreneurship, and investment and positioning. To achieve this a case of a start-up company in the area of chirality was presented. The aim has been to show some of the opportunities and constraints that an organisation is facing in attempting to acquire suitable resources to achieve a desirable network position. However, there is other central issues that have need further exploration. Such areas include the idea of market making, the ideas inherent in technological development and path dependence,

the area of network alliance formation, and the network perspective on the emergence of strategic plans to name but a few.

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