Corporate Alumni Networks and Knowledge Flows

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Introduction

In contemporary business access to external knowledge is essential for the survival of individuals and firms, this is particularly so in the biotechnology industry. In order to access these external knowledge flows organisations encourage employees to tap into the knowledge of their informal network of contacts, they hire new employees with the objective to raising the knowledge base of the firm and finally, organisations engage in formal cooperation agreements to formally access knowledge flows in external organisations. However, this paper argues that these three mechanisms may interact with each other in certain circumstances by analysing the concept of the corporate alumni network and how this facilitates interaction between the three network mechanisms to produce more effective knowledge flows for the corporate alumni network members. The IMP recognises the importance of continued research on knowledge management issues and particularly the interaction between knowledge management and networks. This paper is divided into three main parts, the first section discusses the knowledge economy and why organisations need to access external knowledge in order to survive. The second section analyses the literature surround knowledge flows mechanism. The third section introduces the idea of the corporate alumni network and how this network form facilitates the three knowledge flow mechanisms that are outlined in the literature and how they interact with one another. The fifth and sixth section discusses the methodological approach we have adopted to empirically research corporate alumni networks and knowledge flow mechanisms in an Irish biotechnology setting. Finally, the seventh section draws some conclusions regarding this area of research.

According to Argote, McEvily and Reagans (2003) research on knowledge management in recent years has focused on several main topics; how organisations create knowledge and what factors influence the process, how organisations retain the knowledge they create, where is knowledge embedded in organisations, how is knowledge transferred within organisations or within regions and what factors facilitate or inhibit this transfer, do the factors that inhibit knowledge transfer inside an organisation promote transfer across organisational boundaries and more recently on the effect knowledge has on an organisations competitive advantage (Argote and Ingram, 2000). Instead the human interactions that are the primary method of knowledge transfer (Argote and Ingram, 2000) and the role played by informal mechanisms (Awazu, 2004) have been neglected and it is recognised that there is insufficient research into informal processes of knowledge diffusion at a theoretical and empirical level (Morone and Taylor, 2004). In particular informal networks are thought to play a critical role in the knowledge transfer process; however, our understanding of how informal networks access knowledge flows remains largely undiscovered because of the lack of research that has been conducted on the effect of networks on knowledge transfer (Reagans and McEvily, 2003). Therefore by identifying how networks and epistemic communities operate could shed some light on how widely knowledge is exchanged through a network (Dahl and Pedersen, 2004).

The Knowledge Economy

As far back as the early 1990's authors like Toffler (1990) were promoting that knowledge would become the key to power in the future replacing all other resources as the determinant of power and success. Drucker (1993) argues that knowledge is not just another resource that firms are seeking it is in fact the only meaningful resource

in the economy today and within an organisation. However, the literature has recognised that it may be necessary to source a considerable amount of this knowledge externally as it is often less costly and faster to source knowledge externally that to develop it internally due to the high costs of in house know-how development (Von Hippel, 1987) with relatively few organisations having the ability to internally generate all the knowledge that is required for continuous technological development (Song, Almeida and Wu, 2003). This has provided an incentive for firms and individuals to develop and exploit mechanisms by which they can access the knowledge that they need to survive. In particular, for biotechnology firms, access to knowledge sources is becoming increasingly important (Baum, Calabrese, Silverman, 2000). This is a consequence of several industry factors, namely; the knowledge-intensive nature of the industry (Gertler and Levitte, 2005), the large upfront costs that are associated with the long research and development processes that are characteristic of biotechnology products, the expensive and rigorous regulatory processes and reviews which create barriers to entry but also because the industry is generally dominated by several large players with SME's recognising the need to develop particular techniques to survive. Primarily among these survival techniques is the development of effective knowledge transfer mechanisms between firms as "with the advent of the learning economy, it is widely agreed that competition between firms is increasingly based on the production, appropriation and distribution of knowledge" (Gertler and Levitte, 2005). Therefore "it seems clear that innovative biotechnology firms must be bother open to new knowledge from a wide range of sources" (Gertler and Levitte, 2005). As a result of this biotechnology firms and individuals working in the extended biotechnology industry attempt to position themselves in networks with access to industry knowledge flows if they are to survive. The next section discusses knowledge flow mechanisms that have been examined in the literature.

Knowledge Flow Mechanisms

In the literature there is general consensus among authors over the mechanisms which facilitate knowledge flows. For example, Corredoira and Rosenkopf (2006) argue that organisation structures like alliances, acquisition of human capital and social capital through hiring and mobility and social networks facilitate knowledge flows. Similarly, Brenner (2007) and Zellner and Fornahl (2002) argue that there are three main channels which facilitate the knowledge flow process, "first is persons who hold knowledge are employed by a firm, they move from one place to another and transfer the knowledge they hold. Second, most innovation projects are conducted in cooperation with other actors, who usually contribute complementary knowledge of capabilities. Third, a person involved in the innovation process might obtain necessary knowledge by personal, informal contact with other people. In this case knowledge is transferred from one person to another" (Brenner, 2007). Therefore, the three main mechanisms by which knowledge flows are by informal networks/social and personal contacts or relationships, human mobility/recruiting and formal cooperation, which will be the focus of this paper.

Informal Networks

For a considerable period of time researchers have been aware of the importance and impact that informal networks have on knowledge management (Granovetter, 1985; Nonaka and Takeuchi, 1994; Borgatti and Cross, 2003) and how "networks create access to knowledge for the network actors" (Inkpen and Tsang, 2005). However,

informal networks are difficult to identify distinctly as informal knowledge flows mechanisms are highly dynamic in comparison to formal mechanism as the links and connections are not as well defined (Awazu, 2004). Therefore they are difficult to study empirically (Brenner, 2007) which has resulted in much of the research based on informal networks and knowledge been conducted on a conceptual basis. As firms need to rely on external sources to gain access to the knowledge that they need (Song, Almeida and Wu, 2003) individuals form informal personal contacts with professional colleagues in other organisations that are not part of formal organisational agreements which they can utilise to access knowledge (Szulanski, 2000; Cross et al, 2001; Dahl and Pedersen, 2004). These informal contacts create informal networks where individuals are linked by social or personal relationships rather than professional relationships (Awazu, 2004) with several papers highlighting that these social ties are thought to be especially important for the effective transmission of knowledge as knowledge flows through these social relationships (Agrawal, Cockburn and McHale, 2003; Breschi and Lissoni, 2003; Singh, 2005; Inkpen and Tsang, 2005; Boschma and Ter Wal, 2007; Sorenson and Singh, 2007). An individual embodies more than 'know-how' or 'know-what' but also 'knows-who' (Zellner and Fornahl, 2002), which means that when a person is trying to solve a specific problem they can draw on a wide range of personal contacts and informal networks (Anderson et al, 2001) that they have developed over the course of their career as many network members may have shared "a common career episode (school, university or former jobs)" (Zellner and Fornahl, 2002). In fact, Agrawal, Cockburn and McHale, (2003) hypothesised that co-located individuals develop social ties and a certain portion of those social ties endure once an individual moves creating an informal network of contacts. These informal networks are particularly affective for facilitating knowledge flows as the network members have the advantage of possessing information regarding other network members' skills and knowledge base. Therefore members can contact other network members who they know hold the knowledge that they require (Zellner and Fornahl, 2002). Reagans and McEvily (2003) argue that knowledge is more likely to be transferred between individuals with similar training and background experience or characteristics. They also argue that individuals that communication with each on a regular basis or who have strong emotional attachments to each other are more likely to share knowledge with each other than those who do not communicate frequently or who are not emotionally attached. In general the more individuals are emotionally involved the more likely that they will invest more time and effort on each other behalf including for example, the effort of sharing knowledge. Strong personal attachments also facilitate trust which eases the flow of knowledge between two parties.

Human Mobility/Recruiting

More research has been done on moving employees as a means of knowledge transfer, rather than the other mechanisms perhaps because they are seen as the most powerful tools for knowledge transfer (Argote and Ingram, 2000). As a result, human mobility or hiring has been discussed by various authors due to its importance as a primary knowledge flow mechanism (Saxenian, 1994; Zucker et al, 1998; Almeida and Kogut, 1999; Song, Almeida and Wu, 2001; Zellner and Fornahl, 2002; Rosenkopf and Almeida, 2003). Due to the nature of certain types of knowledge it can only flow by the process of hiring (Zellner and Fornahl, 2001) particularly with tacit knowledge which due to its embedded nature, flows with considerably more difficulty than codified knowledge (Kogut and Zander, 1992). Therefore when individual moves

organisation they can carry and apply their tacit knowledge to a new setting which creates a knowledge flow (Szulanski, 1996; Argote and Ingram, 2000).

Formal Cooperation

The main bulk of literature on formal cooperation focuses on the impacts of cooperation (Rao et al, 2002) but little research has been conducted on discovering the impact of formal cooperation on knowledge flows (Brenner, 2007). While there is a large amount of literature discussing the importance of formal cooperation for innovation, this literature regards any excess knowledge that is transferred within such an agreement as suspicious or as an unwanted side affect of the interaction. To overcome the continued need to create new organisational knowledge, firms and individuals often form alliances or build networks of partners within the industry (Appleyard and Kalsow, 1999). The literature has referred to effective knowledge flows across organisations that are embedded in a network or system of relationships, like alliances or formal contracts (Argote and Ingram, 2000), the use of strategic alliances in acquiring knowledge (Mowery et al., 1996), and licensing agreements as a mechanism for accessing knowledge flows (Shan and Song, 1997).

While it is evident that there is considerable academic research documenting each of the three knowledge flows mechanisms, the main bulk of research has focused on addressing these mechanisms on an individual level with little theoretical or empirical work conducted on how these mechanisms are linked and how they can interact with one another to affect the knowledge flow process. For example, organisations frequently hire on the basis of adding to its existing knowledge base as individuals not only carry different types of knowledge (Zellner and Fornahl, 2002) but they also carry the potential to access several codified and tacit industry knowledge resources. There are several elements to this. First, when an organisation hires an individual they are also potentially creating the opportunity to access any informal networks that the individual is a part of. Corredoira and Rosenkopf (2006) argue that mobile employees carry resources like accumulated social capital in the form of client and within-firm relationships and that employee mobility creates network connections which facilitate knowledge flows or business opportunities. Therefore the degree of access a potential employee has to other networks needs to be considered when hiring. Second, through access to these informal networks there is a possibility to activate other agents in this network which can result in the additional hiring potential of other individuals in this network who can further expand the knowledge base of the organisation. Furthermore, since access to these networks is determined by the work/education/academic path history of the individual (Zellner and Fornahl, 2002), organisations are also provided with the opportunity to tap into referral knowledge or knowledge about prospective employees before they hire them from their former colleagues. Third, informal networks facilitate the establishment of formal cooperation as organisations and individuals can use their network contacts to access knowledge regarding new business opportunities and potential clients. Finally, formal cooperation may provide individuals within participating organisations with the opportunity to expand their informal network of contacts or hiring potential of individuals working within the formal agreement. However, it is important to point out here that knowledge can still flow in the absence of one or two of the mechanism that we have highlighted. For example, in the absence of mobility of individuals, information can still diffuse through social contacts or informal networks (Zander and Kogut, 1995; Stuart and Sorenson, 2003). In other words this paper does not argue

that all the three mechanisms highlighted above are necessary or essential for knowledge to flow effectively. Instead this paper seeks to examine how knowledge flows and these three mechanisms may be linked in certain circumstances such as within a corporate alumni network which will be discussed in the next section.

The Corporate Alumni Network

As we have already highlighted, the degree of access a potential employee has to other networks needs to be considered when hiring an individual (Zellner and Fornahl, 2002), therefore, networking is playing an increasingly important role as the 'know-whom' is nearly deemed as valuable as the 'know-how' (Gann and Salter, 2000). Since access to these networks and the development of social ties can be determined by the work/education/academic path history of the individual (Zellner and Fornahl, 2002; Agrawal, Cockburn and McHale, 2003), corporate alumni networks, are emerging as an interesting topic in networking and knowledge management research as it is clear from several online articles that corporate alumni networks facilitate several important processes which encourage knowledge flows.

As employee turnover and redundancies have increased and companies begin to recognise the benefits of and opportunities to exploit formal and informal networks, firms and individuals are beginning to recognise that "former employees are a force to be reckoned with" (Financial Times, 2005) and the opportunities that these former employees and colleagues can offer as valuable resources to be tapped into. These companies are creating and managing networks of former employees (The Economist, 2001) in recognition that internal and external people are resources worth exploiting (CFO Magazine, 2005). Therefore, the corporate alumni network, has swept through all types of organisations and individuals in different industries as a consequence of an increase in the number of firms attempting to implement networking techniques, like the corporate alumni network, as a mechanism to facilitate links with intellectual property that has dispersed (The Economist, 2001). The pioneer of corporate alumni networks can be traced back to McKinsey, who formalised their corporate alumni programme in the late 1990's. Since then several global companies, from investment banks Goldman Sachs and Morgan Stanley to the Big Four accountancy firms; Deloitte, Ernest & Young, KPMG and PWC, have followed in McKinsey's alumni footsteps and have subsequently launched formal corporate alumni programmes to develop professional and social ties with former colleagues (Financial Times, 2005). There are generally three main forms of corporate alumni networks; some, like the Proctor and Gamble and the Microsoft alumni networks can be formally organised independently of the parent firm but have the blessings of the parent. Others, like the large consultancy firms McKinsey and Ernest & Young manage their alumni networks in-house (CFO Magazine, 2005). Finally, there are several corporate alumni networks, like the Digital Workstation alumni network, that are more informal in nature with the aim of helping people to stay connected socially (Boston Globe, 2003).

The Corporate Alumni Network and Knowledge Flows

While "clearly, alumni benefit from the networking and professional-development opportunities available from their former employees and colleagues" (CFO Magazine, 2005), corporate alumni networks also facilitate the knowledge flow process between network members as these networks are explicitly established to "tap into the expertise of other alumni" (Financial Times, 2005). The shared background and pre-

existing relationships that were developed during their time in a particular company provides the framework of trust and communication that is necessary for flow of knowledge. This occurs as a result of several processes that occur within a corporate alumni network. For example, corporate alumni networks encourage the enduring social relationships that were developed by employees during their time at an organisation, as members use the network to maintain personal contact with ex-colleagues. It allows individuals to renew old relationships (Fast Company, 2002) and "helps people stay connected socially" (Boston Globe, 2003). These personal and social relationships with past and present firm members in turn facilitate knowledge flows between network members. In addition "an increasing number of executives are realizing that networking with former colleagues can lead to opportunities ranging from job offers to business prospects" (CFO Magazine, 2005). For example, corporate alumni networks also provide network members with employment opportunities as former colleagues move out into the industry or set up their own companies. Network members use their personal contacts and social relationships with former colleagues to locate new employment/recruiting opportunities which will expand the knowledge base of the new firm and also to obtain referrals on potential personnel from former colleagues. Corporate alumni networks also provide network members with business opportunities as members use the network as a means of generating new business leads or clients or by using their contacts to access knowledge on new business opportunities and "expand its roster of clients" (Financial Times, 2005). Network members view the parent company and other ex-colleagues as potential clients with managers eager to tap into their personal contacts to expand their own businesses (Business Week, 2006). The next section of this paper discusses the methodological approach that we employ to analyses an example of the three knowledge flow mechanisms in an Irish biotechnology corporate alumni networking.

Methodology

This paper follows the grounded theory approach developed by Glaser and Strauss, 1967) which allows us to develop our theory. Grounded theory is a research method that uses qualitative data from real world observations to derive theories. We have adopted a case study approach as this allows us to empirically investigate a phenomenon "within its real-life context" (Yin, 1994, pp. 13).

By triangulating between multiple sources of data/evidence including newspaper articles, online resources, databases and semi structured interviews with "key informants" in various firms, academic institutions, and public/government institutions, we have been able to compile a case study which highlights the knowledge flow mechanisms which are operating in this network and how these mechanisms are interacting with each other.

Case Study: The élan Alumni Network

The biotechnology industry in Ireland in particular, is a very dynamic and knowledge intensive industry with high development, commercial, regulatory and financial risks associated with drug development. In Ireland there are approximately 60 companies north and south, 41 indigenous and 18 multinational companies operating, which employ over 4000 staff in the industry. These Irish biotech companies are primarily engaged in activities based on biopharmaceutical discovery, manufacturing and diagnostics and what you also have emerging in parallel is a supporting infrastructure of specialist service providers of life sciences VC funds, clinical research and trial

organisations, legal practices, manufacturing, waste handling and disposal. Ireland's biotech industry has very much become a global competitor for R&D investment from multinational companies and leading research institutes alike. Over the last number of years Ireland has secured over $5 billion of biopharmaceutical investment from multinational companies like Amgen, Centocor, Wyeth, Pfizer and Genzyme. This investment is a result of a government funding of over €1.3 billion in recent years and a strong government policy.

One of the most infamous companies operating in the Irish biotechnology industry is élan. élan plc is a neuroscience based biotechnology company head-quartered in Dublin, Ireland that is focused on discovering, developing, manufacturing and marketing advanced therapies in neurology, autoimmune diseases and severe pain. It was founded in 1969 as a pharmaceutical company and diversified into the lucrative biotechnology arena; élan was a story of phenomenal Irish success. In 2000 it operated globally, was the largest company on the Irish Stock Exchange and was a leader in drug delivery technology and pharmaceutical research. At its peak on June 20, 2001 it was worth more than Allied Irish Bank and Bank of Ireland combined and with a share price of €74 it was clear that it was well placed to achieve a leadership position in the biotech industry.

What happened to élan has little to do with uneasy market conditions in 2002 and much more to do with their accountancy practices which, while complying with the rules, in the wake of the Enron scandal were just that little bit too clever. The company were particularly skilful at capitalising on accountancy rules to boost earnings while keeping liabilities under control. It was only in the 2001 audited accounts that élan disclosed that they had sold royalty rights on six of their top products. Instead of disclosing these sales as exceptional non-recurring transactions, élan included them in normal revenues. This resulted in conveniently disguising a decrease in revenue growth elsewhere in the business. élan treated money invested into one of its joint ventures as an asset on its own balance sheet, when the same money was taken back by élan they renamed it as licence and R&D revenue and added it into profits. They estimate that circular accounting was inflated by forty percent between 1997 and 2001. As a consequence of this investors were seriously misled. Until the middle of 2002 the company appeared to be insulated for a liquidity crisis with $1.6 billion in cash.

In the wake of the December 2001 Enron collapse and triggered by the fears among investors, caused by rumours of dubious accounting practices after failing to meet an initial deadline to file the company's 2002 annual report to the U.S. Securities and Exchange Commission (SEC), élan's share price collapsed by fifty-two percent in just one day and alone accounted for a sixteen percent fall in the Irish ISEQ market index. By October 9, 2002 the share price had fallen by over 98% to just €1.23 valuing the company at just €430 million. It was the most spectacular decline in Irish corporate history. The amount of $18.4 billion was wiped off élan's value after the SEC commenced a probe into the business dealings of former managers who set up partnerships to keep research coats off the corporate balance sheet. As a result of this in August 2002, over 400 employees were made redundant from élan.

Ironically, élan's challenges been positively healthy for Ireland and have generated broader growth and development in the Irish biopharmaceuticals industry. The

incapacitation of the company resulted in the emergence several hundred élan alumni into different arenas within the biotechnology industry in Ireland, for example, public institutions like Forfas, the Higher Education Authority (HEA), Science Foundation Ireland (SFI), other global biotechnology companies like Wyeth, venture capital companies, academia, with several ex-élan employees also establishing their own biotechnology companies. While there has been considerable mobility and dispersion of ex-employees into the wider biotechnology industry it has become evident that an informal network has emerged between ex-élan colleagues, which is characterised by sustained interaction and relationships between élan alumni and which we have termed a corporate alumni network. It is also evident that in this case study knowledge is flowing through the three main processes that we have highlighted in the literature review above; informal networks of social relationships, human mobility/recruiting or job referrals and formal cooperation. However, what is also interesting is that these three processes have become interlinked.

Conclusion

While this work is a preliminary study it contributes to understanding how knowledge flows within networks and how knowledge flows mechanisms may influence, affect each other and become interlinked within a corporate alumni setting. However, it is clear that considerable research remains to be conducted in this area and in the general knowledge management area. This case would also benefit from a social network analysis to map the configuration of the network.

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