

Why do Managers from Different Firms Exchange Information? A Case Study from a Knowledge-intensive Industry

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Abstract: This paper explores the motivation for information exchange between firms within a knowledge-intensive industry. The qualitative empirical data is gathered from the Finnish games industry. The industry is seen as a complex system that changes through an evolutionary process. There are three main explanations for such collective efforts. First, the firms want to help each other in order to create critical mass at the national scale. Second, selection operates more strongly at the group level between industries than within the industry. Third, information exchange makes their search functions more effective allowing collective search.

Keywords: Information exchange, knowledge-intensive industry, critical mass, group selection, collective search

1. Introduction

This paper explores the motivation of information exchange between firms within a knowledge-intensive industry. The main objective is to find out why the managers engage in such activities and what it means in the light of the dynamics of the industry. This question has emerged during a case study of the Finnish games industry and its development mechanisms. Within the case study the representatives (CEO, CFO or equivalent) of eight firms were interviewed. The Finnish games industry is here defined to comprise firms that engage in the development and/or publishing of PC, console, mobile and/or online games. The Finnish games industry includes about 100 firms of which the first ones were founded in mid 1990s and the majority after the year 2000. They range in size from one to hundreds of employees and all operate in the global market. As a generalisation one can say that the number of firms with more than one hundred employees is less than ten and the number of firms with less than ten employees is about one hundred. Of these only a fraction concentrates solely on games. The question of the motivation of inter-firm communication within such an industry is approached with evolutionary and complexity theories. The industry is seen as a complex system that changes through an evolutionary process. This is because with these theories it is possible to capture the dynamics that follow from decentralised decision-making and interconnectedness within such a population. The paper starts with a short overview of evolutionary and complexity thinking related to the topic of the paper. This is followed by a description of the information exchange and why it has an impact on the development of the industry. Subsequently, the motivation for the information exchange is analysed with three concepts, namely critical mass, group selection and collective search. Finally, some conclusions are given.

2. Evolution and complexity within the industry

2.1 Evolutionary change and intra-industry interactions

Economic evolution is defined as a process whereby the variation comprising different kinds of firms and their outputs undergoes market selection. As a result, variety is reduced, which gives both the incentives and the opportunities to create new variety in the form of new firms and new kinds of output. Thus, economic evolution incorporates the interplay of competition and innovation. (see e.g. Foster and Metcalfe 2001) Nelson and Winter (1982, p. 4) state that their evolutionary theory of economic change emphasises “the tendency of the most profitable firms to drive the less profitable ones out of business”. This means that performance is a relative measure and those firms are favoured that are better suited to the prevailing circumstances, which translates into better profitability. The evolutionary framework rests on the assumption that an economic system has the tendency to create variation, but only part of that variation can be sustained even in the short run. Thus, it is a matter of trial and error where the main forms of interaction among the firms are either competition or market transactions. But how do the firms decide what kind of variation they will create? This question has been answered in several ways. One is the concept of entrepreneur, the visionary who turns new ideas into business. Another is the tendency for firms to do things that are closely related to what they have been doing in the past. Yet another is that firms do not change what they do unless the present activities present a problem.

In this paper it is argued that, besides competition and market transactions, firms interact by exchanging information and knowledge. This has an effect on what the firms do and that in turn has an effect on how the industry evolves or changes. However, information and knowledge exchange as a mechanism of economic change has been mentioned in only a few publications in the field of evolutionary economics. In a recent article by Muller and Pénin (2006) it is stated that disclosing knowledge is a way of increasing a firm's reputation in the eyes of potential RandD partners. This way the firm appears competent and can, in the long run, access external sources of knowledge more easily (p. 85). Muller and Pénin also emphasise that knowledge is "a collective good, a club good in the sense that it flows only within the communities or networks that produced it and is transferred through complex interactions among the members of those networks" (p. 88). According to this view, knowledge creation is a community effort that results from knowledge transfer, and a firm must show its competence to be included.

In a review of the current challenges in the study of industry evolution Malerba (2006, p. 10) mentions the revealing of information inside a community which is encouraged by five factors, namely improvements by others, achieving of a standard, low rivalry, future reciprocity and enjoyment of being a part of a community. Malerba (2006, p. 15) concludes that "innovation and industry evolution are highly affected by the interaction of heterogeneous actors with different knowledge, competences and specialisation, with relationships that may range from competitive to cooperative, from formal to informal, from market to non-market". Thus, the significance of information and knowledge exchange has been acknowledged but it has not been the subject of thorough examination. This paper attempts to take some steps in that direction by describing information exchange within a knowledge-intensive industry, explaining the motivations for engaging in such activities and discussing the effects of the phenomenon in the scope of industry development. In order to do this, the potential contribution of complexity thinking to understand the phenomenon is discussed in the following section.

2.2 Complexity thinking in understanding information exchange

Following the definition of W.R. Ashby, complexity is "the quantity of information required to describe a system" (Delorme 2001, p. 83). Delorme (2001, p. 83) criticises this definition for being vague since it is not stated what a satisfactory

description would be. However, this definition helps us in defining in what way an industry is a complex system. To describe an industry one would need to describe the variation in the parts of the system, i.e. firms within the industry, and the variation in their connections, i.e. market transactions and other interactions. Wollin (2001, p. 110) adopts the Webster's Dictionary definition of complexity which is the following: "a group of obviously related units of which the degree and nature of the relationship is imperfectly known". Wollin (2001, p. 110) adds that the missing information is either not known or not knowable, but not random. In the case study of this paper this would essentially mean the knowledge of the interaction between the firms. Fundamentally, these interactions take place between people. One does not have to go deep into human cognition to accept that knowing and understanding such a network of interactions, their motivations and effects, is a very hard task and perhaps some aspects of it are unknowable. However, acknowledging the complexity of such a network can help in understanding its dynamics. There is no general consensus regarding the relationship of evolutionary and complexity theories. Some see evolution as a feature of complexity and others see complexity as a feature of evolution. The following is an example of the former view. "The process of evolution is an important integrative theme for the sciences of complexity, because it is the generative force behind most complex systems." (Ray 1999, p. 161) Basically, it does not matter much whether one says that evolutionary systems are complex or that complex systems are evolutionary. In the present paper evolutionary and complexity theories are seen as complementary ways to analyse an industry.

According to Metcalfe and Foster (2004, p. ix), a complex system is a network structure that contains elements and connections. According to their interpretation the connections consist of knowledge and understanding and for this reason knowledge is pivotal to economic systems and a source of economic value. Secondly, they take the view that selection mechanisms can be seen from a complexity perspective and then selection will not lead to an equilibrium or regression to the mean. Selection mechanisms highlight the fact that the variety on which they operate is of prior importance in economic systems and arises from forms of knowledge that are much less prevalent in the biological domain. (Metcalfe and Foster 2004, p. ix) Any knowledge-intensive industry can be regarded as a knowledge-based system. Competitive advantage is built on knowledge. Opportunities and threats arise based on the knowledge that the particular firm or some other

firm may have. Basically there are two types of relevant information or knowledge from the viewpoint of a firm. Firstly, there is knowledge concerning the activities of the firms in question. Secondly, there is knowledge concerning the activities of other firms. Within the decision-making process of a firm these two types of knowledge interact. The industry here in question, the Finnish games industry, is an interconnected system, where information exchanges is an important factor creating the connections between the firms. This means that the firms do not find out of each others' actions merely through the market processes by winning or losing a bidding contest or seeing each others' products on the shop shelf. The firms consciously seek for more information and also disseminate it.

As interconnectedness is a core feature of complexity, the phenomena following from it have been the topic of many conceptual analyses. Two phenomena that have received a lot of attention are self-organisation and emergence. Anderson (1999, p. 221) states that self-organisation is a process where "pattern and regularity emerge without the intervention of a central controller." Self-organisation is not, however, something that complexity scientists and economists have come up with during the twenty years. Schumpeter already described this kind of behaviour in *The Theory of Economic Development*. "By "development" therefore, we shall understand only such changes in economic life as are not forced upon it from without but arise by its own initiative, from within." (Schumpeter 1951, p. 63) According to Smith and Stacey (1997, p. 83) emergence "means that the links between individual agent actions and the long-term systemic outcome are unpredictable". According to Phan (2004), the Santa Fe Institute sees emergence as "a property of a complex adaptive system that is not contained in the property of its parts". However, these definitions of self-organisation and emergence are quite broad in the sense that based on this it would be very hard to claim that some phenomenon is one but not the other. Formal approaches to economy as a complex system have acknowledged the existence of

information exchange as an important factor shaping the behaviour and decision-making of economic agents. However, from the viewpoint of this paper, such work has had two limitations. Firstly, the emphasis has been on information exchange between consumers, not firms, affecting the decision as to which products to buy (for example, Lane 1997). Secondly, when information exchange between firms is considered more extensively than mere price information, then it is information about technology and relating to the decision-making on which technology to adopt and not on what to do with that technology (for example, Kirman 1997). Nevertheless, complexity thinking offers several ways to conceptualise the phenomena arising from interconnectedness. In terms of defining such connections and such phenomena in an industry context there is, however, a lack of approaches going beyond describing or citing examples.

3. Information exchange within the Finnish games industry

During the interviews with the representatives of eight Finnish game firms it became apparent that there is a lot of information and knowledge exchange going on between the firms. Table 1 presents some basic information of the firms along with a summary of their views on knowledge and information exchange. The real names of the firms are not revealed and thus they are identified with Greek letters from Alpha to Theta. A prevalent feature of the information and knowledge exchange between these firms is that it is done in a very informal way and thus published information such as press releases are not regarded as useful. Thus it is a matter of informal relations and interactions. The interviewees reported that they call each other and talk about what they have been doing lately and what they are thinking of doing. There are also meetings where the people from one firm can get feedback from the people of other firms regarding their game project. The social aspect of it all is also very important.

Table 1: The views of the firms concerning information exchange

Firm	Founded	Employees	Platform	Subcontractor	Developer	Publisher	Attitude towards information exchange	Main reasons for exchanging information
Alpha	2004	35	Mobile		X	X	We want to help others.	Critical mass to improve recruiting situation. To gain knowledge about the market.
Beta	2002	27	Mobile	X	X		Everything is easier when you have a network of contacts.	To do marketing. To get inputs for our creative process.

Firm	Founded	Employees	Platform	Subcontractor	Developer	Publisher	Attitude towards information exchange	Main reasons for exchanging information
Gamma	2000	24	Mobile		X	X	Together we can find new profitable things.	To find subcontractors. To understand the global games market.
Delta	1999	100	Mobile		X	X	I can learn from you and you can learn from me.	To find subcontractors. To find employees. To see what others are doing.
Epsilon	2000	170	Online, mobile, handheld, console		X	X	We all help each other.	To find out about the development of the industry. To ponder what is going to happen next.
Zeta	2002	9	PC, online	X	X		We can benefit each other and have fun together.	To enhance the growth of the industry.
Eta	1995	25	Console, PC		X		We want to help others.	To find out what is going on. It is in our interest to see other firms in Finland succeeding.
Theta	1995	13	Console, PC		X		We want to exchange our views with others.	To discuss what the publishers want. To find out concrete leads on sales opportunities.

The following quotes illustrate how the firms communicate and what their views on the effects of such communication are like.

"Our seller does informal cooperation as he meets others. He tells them that we have entered some market and it seems quite good and it is worthwhile to go there. That doesn't take anything away from us. It is based heavily on the personal relationships between people." (Alpha)

"I guess this is typical for a young industry that personal relationships are very important. For example today I am going to go for a beer with a competitor. We are going to talk about what is happening in the market and whether something new is emerging." (Alpha)

"Information exchange is clearly a case of win-win because you can always learn from others and it does not take anything away from you. And a large part of it is simply about having fun." (Delta)

"From our point of view the most important information is what our competitors are doing and we always know that before the press releases come out because word gets around." (Alpha)

"It is also a part of marketing. You should not spend five days a week inside a cubicle. You don't see or hear anything [new or interesting] there." (Beta)

"For example there is one case in which an [graphics] artist had sent a job application

and included works that other people had done in his portfolio. It didn't take more than three days that everyone within the industry knew about it. The guy committed a professional suicide. One can only be amazed at how stupid people can be." (Alpha)

Information exchange seems to be heavily based on personal relationships. People within the industry know each other and enjoy discussing industry-related matters with each other. The underlying assumption is that it is not harmful for anyone to engage in such interactions. When asked why they participate in active communication most of the representatives of the firms stated that there is no reason or that they do it for altruistic reasons. Helping others is seen as a norm within the industry and its benefits to oneself are not considered. However, this cannot be the full explanation since after all it is a tough branch of business and things just cannot be that cosy. As the interviewer persisted in asking on motivation for information exchange some other reasons were also mentioned, as is shown in Table 1.

4. Explanations for collective efforts

4.1 Critical mass

There is quite a good consensus over the benefits of critical mass of firms within the Finnish games industry. The firms do not see each other as threats but as vital creators of critical mass at the

national scale. Critical mass has several aspects here. Since skilled staff is scarce it is in every game firm's best interest to have other potential employers for their staff. This will make the industry appealing for prospective employees and lowers their personal risks in investing their time, efforts and money on industry-specific training and career. This is quite evident in the following two comments.

"We see it so that the more there are entrepreneurs within the industry and firms, in the long run it will help us. One thing is that we will be able to get employees that have worked within the industry. If they want to work in a larger firm then we are an option." (Alpha)

"Some of the other firms here have had to scale down and the first thing that the HR managers do is they call us and say that these kinds of skilled employees would be available. The overall goal is to keep the people within the industry." (Alpha)

As there are more firms, the employees will also have more job opportunities. This also means that there is more demand for skilled workers and they can be persuaded to change jobs. This can cause some tension between the firms, but at least some of the interviewees saw also positive potential in such circulation.

"I think it's good that they get to see new things and develop their skills. Perhaps one day they will come back here to a higher position. I don't see that as a bad thing, but is it punished? I guess some people would like to do some arm-twisting at some cocktail party." (Epsilon)

Critical mass of game firms can also make the industry appealing for prospective investors. The mass will increase the general credibility of the industry and realised success stories can serve as best case scenarios. Critical mass of the Finnish games firms can also serve as a collective track record towards international publishers and operators. Coming from Finland will certainly not get you a publishing deal, but it might open the door for the first meeting.

4.2 Group selection

The definition of an industry through common selection mechanisms is not particularly suitable to the Finnish games industry. The main problem is that competition at the national level is scarce. In addition, many interviewees stated that they do not have any direct competitors abroad either. However, all the representatives of the firms see the firms as belonging to the same industry. It seems that selection mechanisms operate more on a group level. Saviotti and Pyka (2004) state

that as competitive selection between populations or sectors is fiercer than that within a population or sector, the conditions are optimal for the creation of variety. Additionally, variation generation is seen as a prerequisite for economic growth and progress. The findings from the Finnish games industry support this line of thinking since the firms do not compete with each other, but find niches where they can protect themselves from fierce rivalry. This is evident in one comment.

"We just operate in a niche within the ecosystem that is different from those on many other firms." (Beta)

By finding these niches they create variety, which enables them to continue to specialise. This means that the surface on the space of potential content and technology that the population covers is continuously spreading. Group selection is in conflict with selfish maximisation (Bergstrom 2002). However, this line of thinking has both a short-run and a long-run aspect. In the short run the firms could not care less about the survival of other firms, but they concentrate solely on putting off acute fires, such as finding the money to pay the monthly wages. In the long run the firms see the benefits of group thinking. They see that there is selection pressure at the group level as the industry has to compete with other forms of spending free time. At the national scale an important driver for group selection is the institutional setting within which all the games firms have to operate and which they try to collectively change. One example of such lobbying successes is the recently started game development education programme at the secondary level.

4.3 Collective search

Each firm has a search function according to which it explores new possibilities and alternatives to be applied in the future. According to Cyert and March (1992) such search is problematic. This means that firms would not continually search for better ways to do things or new things to do, but they will start the search only once the old way presents a problem. Thus, search is triggered by encountered problems and not by some inner motivation for continuous bettering. However, as it was stated earlier, in a knowledge-based creative industry the creation of new variety is fundamental. It is the inevitable problems that would follow from failing to find novelty to be included in the products in the future, that make search an every day activity. Information exchange means that the firms are not forced to execute a purely trial-and-error type of a search function. The search functions of the games companies are linked to each other because of

the ongoing information exchange between the people of different games companies. This kind of communication allows the firms, first of all, not to make the same mistakes that someone has already made, but also to find potential directions towards which to head. This kind of communication also enables efficient exploitation of existing niches and also the avoidance of fierce rivalry. Communication among the firms allows the evaluation of more alternatives since more of those are known. Also, communication may allow the identification of attributes and aspects that might not be considered if they would not have been discussed with others that have different backgrounds and experiences. The following two comments illustrate the nature of information exchange that leads to collective search.

"A very large part of very good ideas emerge in such discussions." (Gamma)

"And a large part is contemplating. We puzzle over what is happening next." (Epsilon)

Although it is often thought that such an active information exchange would lead to the concentration of the population, it is not the case here. Naturally, there is also such me-too type of decisions, but the overall picture is more characterised by finding out what the others are doing in order to avoid doing the same thing.

5. Conclusions

When asked why they exchange information the managers stated that they do it for altruistic reasons. However, that cannot be the only reason. Another reason could be that this way they can build their personal reputation within the industry and also get personal satisfaction by being able to share their knowledge. This is supported by the interviewees' eagerness to tell about this business to the interviewer. However, the reasons cannot be just at the personal level since the information exchange is often done within working hours. Thus, there must be some kind of motivation also at the firm level. By finding out what the others are doing they can avoid highly competitive areas and find uninhabited niches. However, the motivation of telling what they are doing is a trickier matter. One explanation is that getting the word out on what they are doing might help in getting a good publishing deal. Another one is that in order for the others to play along you also have to pass the ball. This means that sharing information that you have is a ticket to getting the information that others have.

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Collective efforts may also arise from the idea that the industry in question is seen as a group abroad. This then means that competitive advantage has group characteristics. By acting as a group in attracting skilled employees and investors as well as in searching for new possibilities the firms may achieve more than by flying solo. This also applies to changing the institutional setting under which they have to operate. The main conclusion is that information and knowledge exchange within an industry exists and may have a great impact on the evolution of the industry, especially within a knowledge-intensive industry where search is continuous. Even if only market transactions are taken into account, an economy is a complex system because of the interconnectedness occasioned by such transactions. However, taking informal information and knowledge exchange into account adds to that view. As a means of communication market transactions transfer only information, whereas informal exchange of views among the firms allows the transfer of both information and knowledge. From a complexity perspective this means that the dynamics that follow from interconnectedness and decentralised decision-making may have quite meaningful outcomes. Decisions are not taken solely on the basis of market data and intuition, but of knowledge about what others are doing and their intuition is also utilised. This can be thought of as self-organisation, because the firms themselves decide to engage in such communication and the outcome is based on such interactions and decisions made by the firms. The outcome is fundamentally change in the industry structure. This can also be thought of as emergence, and in this sense the analytical difference between the concepts 'self-organisation' and 'emergence' is not so clear.

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