NARRATIVE APPROACH TO STUDY A LEARNING ORGANIZATION

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Abstract
Public funding for biotechnology companies has been substantial in Finland. However, the biotechnology companies in general make no profit and many have lost their faith in the sector. The crucial question for the future of these companies is how to learn to run their operations as a business enterprise and become an established profitable firm. The aim of this paper is to gain understanding of biotechnology business and how to study organizational learning in that context.

Keywords
Learning organization, biotechnology, marketing, narrative

The point of departure
The story of biotechnology business is very unusual if compared to more traditional businesses. Although as a discipline, biotechnology dates back to the first production of beer, bread and wine using living organisms (Hine & Kapeleris 2006), biotechnology as a business is a much more recent phenomenon. It is regarded as the first business industry the emergence of which was based on a series of scientific discoveries: in 1953 the discovery of double helix, in 1957 the discovery of interferon, in 1973 the development of recombinant DNA and in 1975 the production of monoclonal antibodies (Prevezer 1997, Pisano 2006). The first science based biotechnology company was founded out of an alliance between venture capitalist Robert A. Swanson and biochemist Dr. Herbert W. Boyer in 1976 to exploit the technology of recombinant DNA (Pisano 2006). Having the basis in the scientific discoveries, the industry structure came out to be quite the opposite compared to more traditional industries. Before the emergence of biotechnology business, science and business operated in separate spheres. In 1980 the United States Government passed the Bayh-Dole Act, which allowed universities to keep the rights to the research conducted in their labs and gave them the incentive to commercialize their research. It was possible for academics to found companies and still retain their academic positions, which enhanced the flow of information between academic and business environments (Prevezer 1997). In the 1990s, spinning off new ventures from academic labs gained acceptance also in Europe as a valid method of technology transfer (Degroof & Roberts 2004). Therefore, the biotechnology industry has been regarded as the first experiment of a whole industry based on discoveries in basic science (Pisano 2006).
Few industries face such great expectations as biotechnology. It has been considered to be the most promising technological frontier for the coming decades. Biotechnology involves the use of living organisms or parts of living organisms with a molecular mass from 1-100kDa to alter living or non-living materials. These discoveries are used to produce knowledge, goods and services in the fields such as health care, pharmaceuticals, environmental protection, agriculture, food production and industrial chemicals (Pisano 2006, European Commission 2002, Hine & Kapeleris, Rader 2005, OECD 2002). Affecting such great variety of industries and areas of living, the biotechnological applications are expected to revolutionize the lives of individual people and influence whole economies and ecosystems. The quote below is from Maaseudun Tulevaisuus, which is the third largest newspaper in Finland. The quote shows the belief of biotechnology to open up possibilities impossible to the Mother Nature herself.

“Gene technology makes man the master of life and death. Gene technology gives man a possibility to create a new kind of life, to combine the best qualities of animals and plants and to remove the bad ones in a way nature is incapable of. It is by far the greatest possibility of the new century.” (Maaseudun Tulevaisuus 10.9.2007)

As a result of immense technological opportunities, in form of variety of new applications in several industries, the commercial possibilities of biotechnology business seem to be virtually unlimited (Costa et al. 2003, Pisano 2006). To have a head start in exploiting these vast possibilities, public funding for biotechnology companies has been substantial in Finland. In 2003 the public funding in biotechnology research totalled to 185.5 million euros. The amount accounted for 3.7 percent of all R&D expenditure and 8.6 percent of research in universities (Tilastokeskus 2007). The competitiveness of Finnish biotechnology is high when measured with patenting activity and venture capital investments. In spite of this, the importance of Finnish biotechnology for the Finnish economy is still limited. There are no significant exports of biotechnological goods or services either. Considering more generally, the biotechnology companies, not only in Finland but worldwide, in most cases make no profit and many have lost their faith in the sector. (Hermans et al. 2005, Tekes 2006, Enriquez & Goldberg 2000).

Deficiencies in marketing activities have been considered to have contributed for the disappointing failure of biotechnology companies (Costa et al. 2004). Several marketing related issues have been identified as a problem for biotechnology companies. The Finnish biotechnology companies are typically small university spin-outs the operations of which originate from academic research (Tahvanainen 2004). Organizations with this kind of origin are not “naturally” exposed to market knowledge (Renko 2004). In addition, a study of Finnish biotechnology companies identified that they lack clear market-oriented focus, as well as the commercial sense and skill to direct their organization as a business towards the markets. They have no business plans and the cooperation activities are poor (Hermans, Kulvik & Tahvanainen 2004). In addition, it has been argued that university spin-outs, regardless of the industry, face specific obstacles. Firstly, they face a challenge to transform the initial idea, evolved in a non-commercial environment, into an established profitable firm. Secondly, the conflicting objectives of academics, venture capitalists, stakeholders and management team may adversely affect the business (Vohora et al. 2004). As a conclusion, it can be argued that biotechnology companies have serious difficulties in going through the marketing process (Costa et al. 2004).

The crucial question for the future of biotechnology companies is how to learn to transform the innovation in non-commercial environment to an established profitable firm. Only a few years ago the valuations for companies were heavily concentrated on platform technology and science.
There was also common belief among company leaders that the “old rules” of business would not apply to biotechnology. This narrow research-and-development orientation was a recipe for the failure of some companies. In contrast, today biotechnology companies are facing the reality that even science based companies are valued based on selling products, generating return on investment, having approved product lines with significant market potential and a long patent life (Grupp & Gaines-Ross 2002). These are all matters in the sphere of marketing, which interprets the crucial question for biotechnology company success to be: How do they learn marketing? The aim of this paper is to gain empathic understanding of biotechnology business and how to study a learning organization in that context.

Empathic understanding is a form on knowledge that “relies not on evidence of proof, but on imagination and intuition (Strati 1999, 11).” There is a consensus that empathic understanding is a valuable method at least for the first preliminary stage in the scientific analysis. There are scholars who argue that empathic understanding is a valuable method to produce the hypotheses but it must always be followed by verificational methodology. However, there are also scholars who emphasize the heuristic value of empathic understanding. (Strati 1999) This paper is a preliminary study of my doctoral dissertation, where I am focusing on biotechnology business and more specifically on how small biotechnology companies learn marketing. Therefore it is safe to say that in this paper the attempt to grasp empathic understanding is a valid method.

The idea of a learning organization
At this point I need to define the learning organization on a relatively general level. As stated earlier, the purpose of this paper is to gain understanding of the learning organization in the context of biotechnology business attempting as a result to identify more narrow aspect on which I will focus on my further studies. The idea of the learning organization presented by Anders Örtenblad (2002, 2004) is a reasonably general model and takes into account a wide spectrum of perspectives which is a fruitful starting point for my exploration.

Örtenblad’s (2002, 2004) integrated model of the learning organization consists of four complementary aspects which all must be present if the organization is to be considered as a “learning organization”, otherwise the organizations should be called “partial learning organizations.” The first of the aspects is organizational learning, which means how the knowledge that single individuals have learned is stored in the memory of the organization. The knowledge is stored in the organization by finding routinized ways to exploit the knowledge that could be for example standard operating procedures, manuals, shared mental modes and routines. It is the storing of knowledge outside an individual that makes learning organizational.

On the contrary to the organizational learning just described, the social approach to learning rejects the idea of cognitive learning by individuals or an organization as an individual. Learning takes place in social interaction and thus learning means participation, not acquisition of knowledge. The approach emphasizes that the learning takes place in the situation where the new knowledge is going to be used. Örtenblad (2002, 2004) calls this type of social approach “learning-at-work” aspect of the integrated model, since the learning can not take place separately from where the knowledge will be used.

The third aspect of the learning organization is a learning climate. Örtenblad (2004, 133-134) describes it as “positive atmosphere that makes learning easy and natural.” The organization does not control learning, but has established structural elements that facilitate the learning of all employees. The employees are provided with uncontrolled space and favourable conditions for learning. The fourth aspect, the learning structure, depends on learning. As learning is an outcome of the learning climate, the learning structure is an outcome of continuous learning. The learning
It may seem that my attempt to grasp empathic understanding of biotechnology business may be at odds with the idea of the learning organization by Örtenblad (2002, 2004), for the reason that the integrated model he developed is quite functionalistic. However, Örtenblad created the model inductively based on books, articles representing a variety of approaches and also interviews of practitioners investigating what is meant by the term “learning organization”. In the two articles while developing the model, he discusses a range of approaches to learning in relation to the model. I will use the model as a source of ideas to find out which areas of learning I should focus on in my further studies. Thus, my attempt is not to fit the model as it is to my narrative data. In the following I will explain the method of how I conducted this preliminary study.

**Narrative Patchwork**

“I would like to offer some disclaimers not merely to disarm the impatient critic, but in order to shift the burden of my exploration from the rules of logic to the rules of friendly persuasion.” (Sassower 1994, 186)

In this paper I use an experimental method, which I call Narrative Patchwork. I am inspired by a method of handicraft, patchwork quilting, which women have used since 980 B.C. Patchwork quilt is a quilt where small pieces of fabric are sewn together to form a design. Quilted blankets were originally produced from left over fabrics but today quilts are even made as art pieces that take a political stand. It is an important part of tradition of handicraft and thus also a part of the curriculum in most elementary and high schools in Finland. I will use the idea of patchwork quilting to illustrate the reasons to use this type of experimental method.

Usually quilters have a small stash of fabric at home, from where they choose fabrics for a new project. Choosing a design and fabrics for a quilt can be tricky. Certain designs emphasize certain kinds of colours and textures and on the other hand certain designs will fade some textures to the background. Furthermore, certain colours make others blossom but make others look dull. Colour dominance is a complex issue depending on the overall combination of the fabrics selected. To create a harmonic and soothing effect one can choose monochromatic colours i.e. different shades and tones of the same colour. When complementary colours are placed next to each other in a quilt, they stand out from one another. Complementary colours provide an instant contrast, which is necessary if some element is needed to stand out off the background. The combination is the key to a successful end result.

The layout of the patchwork quilt means the form in which the pieces from the fabric are cut and how these pieces are assembled. By assembling the same pieces differently the result can look totally different. In my study, the revealing and exposing aspect is pursued through the assembly of the pieces of narrative. I do not change the stories in the narratives, but the assembly makes them to stand out just like the colours in a patchwork quilt.

The idea of constructing a narrative patchwork started to develop based on an interesting contradiction in the literature of biotechnology marketing. Although there is an increasing number of studies on biotechnology industry, little attention has been focused on biotechnology marketing. In these few studies the data has been collected with structured or semi-structured questionnaires relying heavily on quantitative data. The conclusions in these studies have been made by comparing the data and results to marketing illustrated in textbooks or previous studies. As stated earlier, the conclusion in general is that biotechnology companies do not have marketing skills and that they have problems throughout the marketing process (Rajamäki 2007).
However, there is also evidence that biotechnology companies exhibit market-oriented behaviours, but these behaviours are not completely similar to the type of market-oriented behaviours suggested in previous literature (Renko 2004). To explore this interesting contradiction further I interviewed the CEOs of small and medium sized Finnish biotechnology companies. I asked them to tell a narrative about their everyday marketing practices in order to engage the meaning of marketing to these scientist-entrepreneurs. Constructing a narrative based on the articles and interviews, I was able to find a rich variety of marketing related activities even in a relatively small data. However, there were only a few references to learning marketing. This is how I came across the idea that I should conduct the study like a patchwork quilt and try different layouts of the narrative pieces to find one that makes the learning aspect stand out from the story.

In my narrative stash I had three kinds of materials. Firstly, in my stash of narratives I had articles from academic journals. Because of the small number of articles focusing on biotechnology marketing, I have used journal articles dealing with biotechnology marketing, more general articles on biotechnology business, commercialisation of university research i.e. articles that at some level touch upon marketing issues.

Secondly, I have the interviews of small Finnish biotechnology companies. The biotechnology industry in Finland is characterized with a high proportion of small and medium-sized companies (Hermans et al. 2004) which is why I focused on SMEs in my interviews. The data gathering consisted of five interviews of companies that had between 2-25 members of staff and located in Tampere, Helsinki and Kuopio. Four of them were located in business incubators and one in a Life Science Business Park. The fields of operation of these companies were microbiology, drug discovery, production of genetic tools and analysis services. The names of the companies and any information that might compromise their anonymity have been removed from this paper.

I collected the data with phone interviews, which were recorded and transcribed. I asked for permission to record the interview at the beginning of each interview to which all the respondents agreed. The interviews were conducted in Finnish or English depending on which was the mother tongue of the respondent. I conducted the interviews asking the scientist-managers of small biotechnology companies to tell a story of how marketing in their company has been in practice from the early days to this point. The aim was not to challenge the “facts”, but to engage with the meaning of a story (Gabriel 1995). This is why the respondents were invited to speak freely and questions were asked only for clarity’s sake in some interviews.

No explanation or definition of marketing was given to the respondents, because the aim of the research was to find out what would be the things they talk about when they are asked about “marketing”. As Renko (2006) stated, biotechnology companies exhibit market-oriented behaviours but they are different from mature industries or textbooks. Had I taken the textbook definition as a starting point, it would have guided the respondents’ answers in a way that much of the issues focused in this study would have remained undetected.

My third bundle of narratives lies in the domain of aesthetics, namely the artefacts of popular culture. The narratives which I have used in this paper are from science fiction literature, more specifically the genre of literature called “biopunk” that consistently explores the dark side of the biotechnology revolution and the dangers of synthetic biology. Despite the fact that technology plays a central role, the authors seek to analyze the consequences of technological progresses for mankind and its environment (Idier 2000, Thorne 2005). The originator of this genre is considered to be William Gibson who wrote the book Neuromancer in 1984. In the Gibsonian world, technology is far more powerful than in traditional science fiction literature where
technology is seen as a way of making life better. In this Gibsonian rather dystopic world, technology extracts human beings from their nature and induces them a new artificial reality. This may sound far fetched, but in fact in some areas of biotechnology it has long been an everyday business, a good example being the In Vitro Fertilization (IVF). Sarah Franklin (2006) has studied the IVF from anthropological approach. According to her:

“IVF involves a wholesale takeover of the entire business of a single cycle, and, as mentioned earlier, is not so much “assisting” as replacing it. Indeed, from the very outset of IVF treatment, a woman’s own cycling mechanism, in the form of her regular hormonal cycle, is eliminated and replaced by a bespoke artificial cycle that offers precise biological control.” (Franklin 2006, 549)

In the Gibsonian society the world drives for money and multinational capitalist corporations who have gained all the power. The literature explores individuals or groups who struggle under a totalitarian government or mega corporations who misuse biotechnologies as a means of social control of profits. The ends of these stories often remain unresolved. The protagonists fail to change anything or end up conforming the society’s norms.

Compared to other genres of literature science fiction in general has distinguishing capabilities to evoke empathic understanding. A science fiction story is placed in the near future which gives the writer more space to play with ideas, because the story has no direct comparison to historical events or real memories. A science fiction author is not afraid to break norms or established paradigms in order to explore human motivations (Idier 2000). Science fiction detaches the reader from the world of rational thought and frees him to play with ideas.

To construct narrative patchworks from these pieces of narratives I was inspired by the idea of Narrative Collage Method presented by Monika Kostera (2006). The narrative collage is an experimental method where the researcher collects and edits fictional stories collected from the respondents. The method does not concentrate so much on analyzing the material, but instead after the collection of the stories the researcher writes her own story as a response to all collected stories. The form of a collage is a story of what the researcher has learned from all the collected stories. According to Kostera, the researcher should not try to force the assembled stories in some preconceived mould. The flow of narratives should be followed as faithfully as possible. The aim of composing a collage is to bind the narratives in a collective level (Kostera 2006).

There are differences in the Narrative Collage method and the method I have used in this paper, which I should point out. The first difference is that Kostera (2006) uses certain kinds of interviews. In my stash of narratives I have narratives from a variety of sources. Also, in creating her own story, Kostera follows the structure of the narratives. On the contrast, I have assembled the narrative pieces by trying different combinations to find out a layout which would reveal and expose the issues relevant to my research question. Having said that, I found my inspiration from the idea that a researcher creates a collage like an artist who creates a visual collage. Just as every visual arts collage is unique, each narrative collage is unique. Depending on the author, some elements are emphasized and some go to the background (Kostera 2006).

In the following I will discuss the reasons for choosing a certain layout for my narrative patchwork presented here.

**Layout: sewing the pieces together**

Using stories in academic writing it is possible to anchor scientific reflections in human experience (Eco 1997/2000 ref Kostera 2006). When we explore the stories of ancient or primitive civilizations and their rituals, it becomes obvious that their meaning and actual
influence was to carry people through difficult changes that were needed to change the patterns of everyday life (Campbell 1990). Narrating is a way for us to make sense of the world around us and stories are the means to share our world (Kostera 2006).

Stories are highly relevant when considering learning. In all stories, there is the same basic structure, the Monomyth, which is remarkably similar every time whether they are children’s stories, stories about primitive cultures or ancient mythology. There is a hero who seeks a destiny outside the known world. There are helpers who aid the hero through a series of trials. The trial ends in a victory and the hero returns to the old world bringing good to the whole mankind. In the stories with this structure, the important aspect is that the objective world remains the same, but because of the transformation of the subject, the world is seen as changed. The purpose is not to describe a factual reality, because the victories achieved are psychological. The Monomyth tells a story of learning. (Campbell 1990).

Stories provide explanation and understanding of the world we live in (Cash 1997). According to Kostera (2006), “the plot, which is a strategy of transition from one state to another, helps to establish connections and associations between phenomena and between actors. A plot does not need to claim causal relationships, but helps to show what actions have been taken by which actors and what the consequences were. It is the traditional way of presenting material in organization studies, especially in case studies.” Presenting materials in a form of a story is useful in my situation here since I have a small number of narratives which are constructed from different approaches and in addition to that make partly contradictory arguments about biotechnology marketing. Also, there is not enough evidence about biotechnology marketing in Finnish biotechnology to establish causal relationships. However, presenting it in a way of story we can grasp an understanding of everyday practices of biotechnology business even though the data is fragmented and contradictory.

Difference between the interpretation and understanding should be pointed out here. They are different forms of knowledge where there can be intellect about a practical conduct but only understanding of a passion (Sartre 2006). Understanding is a process which does not necessarily demand the researcher to have directly lived the experience he/she wishes to understand. The understanding is achieved by reliving and re-experiencing the lived experience. According to Strati (1999) the reliving of the lived experience which happens in imagination is the main data source for empathic knowledge. This sort of imaginative reliving is not an intellectual process; on the contrary it is an experiment where the researcher him/herself creates the qualitative data used for empathic knowledge.

Strati (1999) calls this sort of reliving an imaginary participant observation. In the case of empathic understanding the point of observation is based on the researcher’s imagination. Because of the imaginary aspect, the researcher is free to adopt several points of observation: “Without obliging the observer to share the standpoint of the observed, and conversely without obliging the observer to place him/herself in the shoes of all those who participate in the action, this situation enables the researcher to consider the organizational action from several points of view, however incomplete and fragmentary they be (Strati 1999,70).” The researcher may adopt several points of observation on the intentional action, such as the author of the action, some other subject involved with the action or the participant observer. These points of observation are always ones based on his imagination. The distinguishing feature of imaginary participant observation is that the researcher is not obliged to place himself in the shoes of the author of an action.

Next, I am going to show my narrative patchwork and after that I will discuss it in more detail.
The narrative patchwork

“Try to imagine being without any physical or mental pain. You will be fulfilled with happiness, joy and satisfaction.” (Slogan in ILO advertisement)

It is year 2099, ten years after decoding the human genome and the discovery of ILO, the perfect drug, which allowed humans to experience beautiful and euphoric states of consciousness beyond what you could possibly comprehend.

The discoveries leading to the decoding of the human genome were made during a short period of time in research labs all over the world. The result was a “patent thicket” of overlapping intellectual rights. That pretty much paralyzed the institutions who owned these rights to exploit them in any way without violating someone else’s intellectual rights. This led the biotechnology industry into the era of cooperation and patent pools. In the spirit of goodwill and collective benefit, Triple Helix Corporation was formed. Basically it was a consortium of the government, major biotechnology organizations and universities, coordinating the education, scientific research and exploitation of biotechnological innovations by regulating the Universal Patent Pool.

There were two kinds of researchers working in Triple Helix Corporation. There were researchers who valued the relaxed atmosphere, easy tasks and the free daily dose of ILO. Other researchers were enthusiastic about the research areas and valued that more than a good pay. Triple Helix Corporation basically ripped off its researchers. The salary that it paid to its employees was barely enough to pay the rent for a house in a bad neighbourhood. Those who had even modest ambitions for a reasonable life-style, usually left Triple Helix Corporation after their education was complete to find employment elsewhere. John Conner, a scientist working for Triple Helix Corporation, did not worry about the poor salary. He enjoyed the easy life without pressures. He could focus on special scientific problems that interested him. In addition to that, he was too lazy to seek employment anywhere else.

It was a well kept secret that ILO had unpredictable side-effects in some humans. Instead of inducing a biological nirvana it caused the brain to slowly and painfully shut down eventually causing death. Among many others, John Conner was chosen to work on a large project with other colleagues to develop a cure for these fatal side-effects caused by ILO in some individuals.

At the point when John Conner’s contract with Triple Helix Corporation was ending, John Conner found some interesting thermostable enzymes from hot springs in distant rainforests on his summer holiday. The whole research group was excited about this new enzyme he had found. They filed a patent for it and in the patent application they wrote the name of the entire research group. This was the traditional custom in this age of collective benefit. It was about those days when John Conner realized that there was something shady going on with the project. In fact, the company was only interested in using the results to engineer a new modification of ILO, which would actually be used as a bioweapon for the government. It would be a drug, which would cause the brain to shut down at all who would take it.

John Conner was maybe a lazy poor dope, but yet he was no terrorist! He was thankful when Triple Helix Corporation offered him a seductive opportunity out of the difficult moral dilemma. John Conner was offered an opportunity to create a spin-out company and continue to develop a cure to the fatal effects caused by ILO. The technology transfer office estimated that the commercial possibilities of this kind of product would be unbelievable. John Conner could have loads of money and continue the easy lifestyle he had been used to. So the technology transfer office handled all the paperwork and the spin-off was established.
Sadly, the spin-off soon faced severe problems. It turned out that the technology transfer office did not know a first thing about biotechnology or how to estimate the market potential for this kind of product. It turned out that the “grant mentality” did not apply when running a business. The spin-off desperately needed cash to come in right from the start, but John Conner did not know how he could get money coming in. He could not start just knocking on doors of the customers. It was not like selling washing machines or vacuum cleaners you can sell in stores. It was a much more complicated product which consisted of some advanced modelling of DNA sequences. John Conner relied on his prestige as a scientist and believed that once people would see his extensive reference list, they will be convinced and ask for his service. The life for John Conner did not look bright. He was no longer a part of a group of respected scientists engaged in academic research and producing publications, but a sort of a businessman. What comes to the business world for that matter, he was not very successful in that either.

John Conner did not know anyone in that field of business so he started to create awareness buying drinks for other scientists who were employed at potential customers. Months went by but he did not get any customers. The company was about to run out of money and die. One night at the bar where John Conner used to entertain his “future customers” he came across an investor. She got interested of the possibilities of the technology John Conner was developing and was willing to invest money in the company. John Conner was ready to take all the help he could get to avoid the facing bankruptcy.

The cooperation with the investor turned out to be an excellent decision. She had extensive knowledge and experience in marketing and she knew exactly how they were going to proceed. First it would be business to business communication. After that the communication would move to other interests groups such as distribution networks and in the end the public audience as well. The second stage would be strategic partnerships with companies they had worked with. The investor helped with everyday practices regarding marketing and running the business. John Conner focused on developing the technology. Having at last time to focus solely on research, he succeeded to develop an effective molecule for the fatal side-effects of ILO. The business seemed to finally succeed.

Unfortunately the scaling up turned out to be impossible, so the compound could be produced only in small amounts at a time. This would raise the price of the end product so high that practically there would be no markets. The market-potential was so small that the investor lost her interest in the company and walked away taking her money with her.

A year after this, John Conner was still an entrepreneur of a sort. He started to spend the days in a little underground fermentation facility producing modified compounds in a small scale, and modifying them with cheap illegal Chinese mutated enzymes. During the nights he wandered in titty bars and such low-life settings networking and meeting people and thus trying to expand his illegal market.

During these dark times he was able to get some cash thanks to one particular compound he happened to discover. The request for the development of this particular compound came from the customer interface, more specifically from drug dealers who asked him to work on a particular enzyme that would work well on certain street drug. The word of the project well done started to spread and John Conner managed to get a small but steady customer base in that field.

One day, he heard rumours that someone was on the streets looking for him. As he had done some business using illegal enzymes, he tried to hide, but the people that were looking for him
were quite tough and found him easily. The people looking for him were working for a shady pharmaceutical company that had an illegal database for a “designer baby” DNA, and they wanted to wire John Conner into the thing in order to do some advanced computer-aided molecular modelling studies on a certain enzyme that requires specific scientific knowledge about DNA modification that John Conner had discovered in the first years of his entrepreneurship when he was still doing perfectly legitimate business with the help of the investor. They pointed out that John Conner could never legitimately personally benefit from that discovery, because in the process he used the thermostable polymerase he found from the hot springs while working in Triple Helix Corporation. It meant that there would be an argument of who owns the IP rights and if Conner resisted to waive the rights the Triple Helix lawyers would eat him alive. If he agreed, he would be offered a lot of money and maybe have a chance to enjoy the lazy life he dreams of. He chose the easy way and signed the contract.

Two years after, John Conner is feeling happiness, joy and satisfaction. He is experiencing beautiful and euphoric states of consciousness beyond what you could possibly comprehend. John Conner is developing bioweapons in the pharmaceutical company he agreed to work for. In fact it turned out to be a secret division of Triple Helix Corporation. Business of Triple Helix Corporation is better than ever. ILOrapid is a new generation of ILO, which Triple Helix Water Division adds in tap water. Now John Conner and his co-workers are in a lifelong biological nirvana that only ILOrapid can bring.

**Discussion and conclusions**

In the narrative patchwork, I tried to grasp the empathic understanding of biotechnology business. In this chapter I will discuss the empathic understanding of biotechnology business and learning of marketing in that context. The purpose here is to illustrate the route to empathic understanding.

In the biotechnology business literature two areas related to cooperation are currently of great interest. The first one is the problem of “patent thicket”. The strong intellectual property (IP) position is considered to be one of the main features that distinguish the successful ones from the rest of the companies. Consequently, companies are motivated to retain the technology exclusively for their own use (Horn 2003). In the industries such as semiconductors, computer software and biotechnology the patent system is creating a “patent thicket” which is a web of overlapping IP rights. Companies seeking to bring new technologies to the market have to navigate the thicket by obtaining licenses from multiple patent holders (Shapiro 2001). Identifying the blocking patents, conducting negotiations with the patent holders is a costly process not to mention the cost of paying royalties to multiple patent holders. One of the suggested solutions to this problem is a patent pool, a one-stop technology platform licensing programme providing a fair and reasonable access to a portfolio of worldwide essential patents under a single license (Horn 2003). The problem with the “patent thicket” in the narrative patchwork is solved by the patent pool governed by Triple Helix Corporation. The other trend in literature is the cooperation between industry, university and the government. Academic conferences have been organized to focus only on the industry-university-government relations. In academic research this concept concerning industry-university-government relations is called Triple Helix (Leyesdorff & Meyer 2003). The narrative patchwork presented earlier is situated in the near future where the industry-university-government cooperation has gone so far that the mega corporations, government and university form one powerful and seamless entity, the Triple Helix Corporation. However, one important aspect of patent pooling is that it should be non-discriminative, which is not the case in narrative patchwork. There is a problem when a profit seeking organization with vested interests is governing a patent pool. Thus, in the end of the story the Triple Helix Corporation does not offer John Conner any possibility to have a license to the thermostable polymerase, in contrast they use it to block out John Conner from the market.
Rodgers et al. (2002) argue that it is a common myth that there are plenty of entrepreneurial academics working as researchers at universities. They argue that the low level of salary attracts only two kinds of people to pursue academic careers. Firstly, those who are willing to make a substantial material sacrifice believing that someday they will find a way to be wealthy. Secondly, there are the kind of people who value the academic freedom and possibility to focus on their subject of interest. These kinds of people are not the ideal basis for IP exploitation via university spin-out. In the narrative patchwork, these are the kinds of people working in Triple Helix Corporation.

When creating a new biotechnology business, there are some pitfalls that should be pointed out. The academic tradition of collaboration may be a problem when seeking to commercialize new technology. It might not be clear who actually owns the IP rights. If there were other people involved or the IP was generated using the collaborators’ material they may have legal rights to the IP (Kapner & Chory 2002, Rodgers et al. 2002). Even if the idea came out entirely from the scientist’s own effort, his employer may have legal ways to prevent anybody but the employer to commercialize it (Kapner & Chory 2002). Even if John Conner found the thermostable enzyme on his holiday the university was able to prevent him from using it personally. Furthermore, writing the names of the whole research group in the patent application was not a good idea considering the commercialisation of the discovery.

Generally all stories begin with a “call for adventure”, which is an accident that can be called the awakening of self. It can happen by accident or through a messenger who represents the powers of faith (Campbell 1990). In the field of biotechnology, the government has been an active messenger trying to encourage universities to commercialize their innovations and proprietary rights. Universities are motivated to exploit their intellectual property political and financial pressures. In 2004 the legislation was changed and the commercialization of scientific innovations became one of the tasks of universities (University law 715/2004, §4). In a way they have been successful doing that because the majority of biotechnology start-ups in Finland are university spin-offs that have their origin in academic research conducted in universities (Tahvanainen 2004). Therefore, the university was actively pursuing the idea that John Conner would start a spin-out.

Quite often it happens that the protagonist does not follow the call. The essential thing in refusal is that the protagonist does not want to give up the privileges of comfortable life he has been used to. He wants to secure the system of his old values, useful qualities, aims and privileges (Campbell 1990). It can be difficult for a scientist and the whole company he has founded to let go from the privileges such as gained prestige in academic community. The question is not only about prestige. In fact, if the issue is assessed strictly from a financial point of view, it would be the worst career option of all possibilities for a scientist to start a spin-out company (Bains 2005).

Universities have established technology transfer offices to handle the commercial exploitation of their IP. Traditionally universities have done that by licensing but more recently they have been seeking to do it by helping to create commercial enterprises (Campbell 2005). In practice, the help and advice from the technology transfer office can be quite poor. Technology transfer offices are bound by budget constraints which leads to the situation that in many universities the staff who has poor or inadequate experience are dealing with too many cases (Rodgers et al 2002).

In my interviews the marketing activities consisted of creating networks and inform other scientists about a technical innovation. However, as my interviews showed, also the protagonist does not want to engage in marketing activities himself. To retain some degree of the academic
prestige, they conceived that biotechnology marketing could be only done in some special way. That special way was comprehended to emphasize public relations and marketing communications and it excluded sales functions the way home appliances are sold. The interviews of biotechnology companies revealed that besides the technology transfer offices, there is a lot of help for marketing activities available. Investors and partners from the customer interface can bring skills and knowledge to the company. In the interviewed companies, the investors have helped in everyday marketing activities.

The interviews showed clearly that once the company was already founded, the marketing activities were started at the point where the company comprehended the threat of its own extinction. In the use of a chemical compound there can emerge unpredicted limitations of use. For example, it could turn out that the compound could degrade at certain temperatures, which would limit the possibilities of use. Because of the unpredicted limitations of use, the size of potential market can turn out to be significantly smaller that estimated. This is what happened to John Conner when there emerged the problem with scaling up. The market potential turned out to be drastically overestimated. The investor left and John Conner was forced to start marketing his merchandise himself.

Several key issues of biotechnology business were illustrated when John Conner succeeded in the business with drug dealers. Firstly, in the interviews the respondents were relying on the effectiveness of word of mouth. This is illustrated in the patchwork story when the word about the protagonist’s products start to spread in the drug dealer community. In addition, it is difficult for biotechnology companies to build marketing and sales operations except when their products fit into niche areas, which can be reached with rather few people (Williams 2005), such as drug dealers in the case of John Conner.

The story ends in a Gibsonian way. John Conner ends up obeying the rules of Triple Helix Corporation.

Organizational learning implies being aware of the different levels of learning. It also implies the storing of knowledge in the organization. Individuals learn as agents for the organization. The learned knowledge is stored in the memory of the organization which makes the learning organizational (Ortenblad 2004). In the story there where helpers who came from the customer interface as well as investors who acted as agents and brought the knowledge into the organization. However, even if the companies are effective in finding help with the needed knowledge, it can not be concluded that there occurred learning as well. There was no evidence that the knowledge of the individuals would have been stored to the organizational memory. In contrast, it was seen a way that the scientists could focus on research and development when someone else was focusing on marketing.

“On-the-job learning” is learning that happens during working situations instead of formal courses (Ortenblad 2004). In the story learning was taking place in working situations. The helpers came to the organization and helped in everyday actions as can be seen in the quote below.

“Marketing skills have actually come to this company through new partners who have entered our company so you might say that in a way based on the business idea from customer interface and interest groups came investors who have worked in this company and even have been helping in the operative level. All who have come have had quite solid experience in marketing as well.”
This was also the case in the story of John Conner. Interestingly, he did not himself participate in the marketing activities. Instead the investor was taking care of all marketing issues. Even though John Conner did not participate in everyday marketing activities, there was evidence that still he did learn marketing. From the on-the-job learning point of view, learning means participation. Thus, this view reveals that the biotechnology companies are quite actively participating and learning. The participation is focused on customer organizations instead of participating in the process of direct selling, mailings etc. They are actively creating networks and building awareness inside customer organizations.

In the story, John Conner believed that it would be essential to know the people inside customer organizations on a personal level in order to do business with them. That is why he wanted to have drinks with them, because he saw the personal relationship as a threshold to a customer relationship. On the contrast, the investor had more “textbook approach”. She had view of strategic planning in marketing, where the process would evolve through steps planned beforehand as it says in the story “First it would be business to business communication. After that the communication would move to other interests groups such as distribution networks and in the end the public audience as well.” The contradiction here, was partly evoked by interesting quote in my interviews:

“In our situation it is slightly different because they really did not know anybody so we could not get custom…”

Reading this quote from the “textbook perspective”, the interpretation could be that there are problems defining the potential customers. Reading this quote from the social approach perspective it would refer that they did not know the customers at the personal level.

Learning climate is an organization that facilitates the learning of its individuals. It is a positive atmosphere that makes learning easy and natural (Örtenblad 2004). In the story we can not see much positivism in the atmosphere. The learning of marketing was started only by the fear of bankruptcy. This is an interesting issue, which should be explored in more detail.

In the literature, the role of public support and universities is considered important and it is heavily emphasized. In Finland the emergence of the whole industry is seen to largely be the result of public actions and political motivation (Schienstock & Tulkki 2001). Also, the effective technology transfer from universities to spin-out companies has been studied extensively. When we look at the issue through the story presented in this paper, the role of public support and technology transfer offices is just to give an incentive to company formation. Considering the learning of marketing in biotechnology companies these institutions do not contribute much.

Instead, in the story public interference can cause tragedies at the level of one single person. In the literature, the university-industry collaboration has been considered as a win-win situation. The story reveals that the power balance between a university and a small biotechnology spin-out could be harmful for the interest of the company when the university’s concentration is focused to cash out its intellectual property fast and effectively.
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