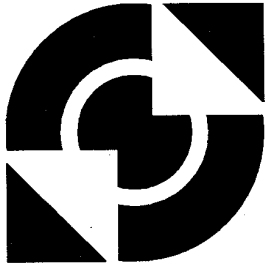


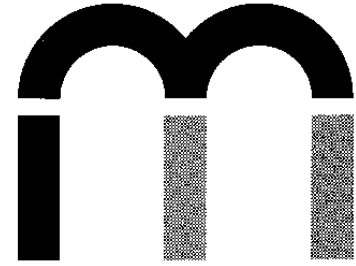


**Universität Lüneburg**



**Universiteit Twente**

**CASE STUDY**



**Manchester Business School**

**Universität Kiel**

**‘THE VIRTUAL BIOTECH COMPANY’:  
MANAGING TECHNOLOGY AS A VIRTUAL COMPANY**

## **Case Study ‘The Virtual Biotech Company’**

### **Case Study ‘The Virtual Biotech Company’: Managing Technology as a Virtual Company**

The case study is based on a ‘European Workshop on Strategic Technology Management’ which took place at the University of Lüneburg, September 9<sup>th</sup> - 16<sup>th</sup> 1997. The Workshop is part of the partnership between the University of Lüneburg, the University of Twente, Manchester Business School and the University of Kiel. The students were given the opportunity to study a virtual organisation in the area of biotechnology. We greatly appreciate the high involvement and the huge support the participants have given during the workshop.

# Case Study 'The Virtual Biotech Company'

## Contents

### 1 Introduction

### 2 The Company

### 3 Aims of the Case Study

### 4 The Tasks

#### *4.1 Discussion Part I: Concept of a Virtual Organisation*

#### *4.2 Discussion Part II: Selected Problems of 'The Virtual Biotech Company'*

##### *Topic 1: Commitment*

##### *Topic 2: Marketing*

##### *Topic 3: Project Development*

##### *Topic 4: Information Management*

### 5 Literature

## Case Study 'The Virtual Biotech Company'

### 1 Introduction

High complexity of R&D projects and international competition are factors that lead to more cooperation especially among small and medium sized firms. But even large integrated firms are often not willing or able to perform the necessary amount of R&D and to cope with the uncertainty inherent to radical innovations.

In a virtual company, members form a network, offering various kinds of resources. Different projects could be pursued combining some member's resources on a timely basis. Thus, specific assets of a virtual company are its flexibility and ability to handle complex projects. Costs of coordination and motivation could be lowered if the virtual company succeeds in building trust and commitment. On the other hand, lack of these will pose severe problems.

Virtual organisations entail elements from 'the market' and 'the hierarchy'. Such hybrid institutional arrangements could be compared to these classical forms with respect to its transaction costs. Especially in high tech markets with a strong scientific-technological basis and rapid development of technology the concept of a virtual organisation seems appealing: high R&D costs and risks could be shared, developments and time-to-market could be accelerated and the partners could concentrate on their respective core competencies. But in order to successfully organise in a virtual way one has to study common problems of such organisations and think about ways to overcome those.

In this case study the concept of a virtual organisation will be discussed and key problems will be addressed. As an practical example we have chosen a virtual company in the biotechnology field: it is a heterogeneous technology area with high stakes but also high risks, which has derived considerable attention from several industries, the 'scientific community' as well as from public institutions.

## Case Study 'The Virtual Biotech Company'

### 2 The Company

#### 'The Virtual Biotech Company': General Information

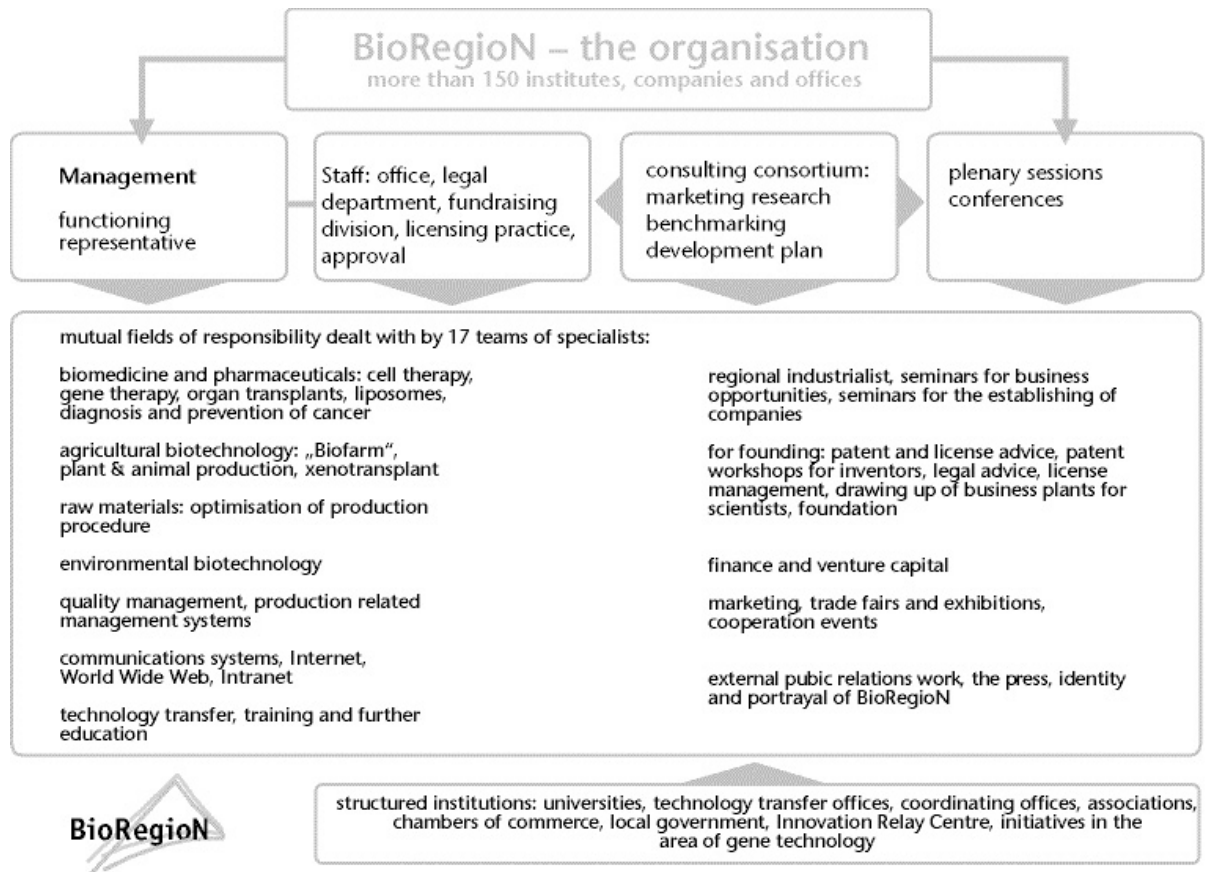
In 1995 the ministry of Research and Technology (BMBF) announced a competition: the regions with the most promising concepts of doing and commercialising R&D in the field of biotechnology were said to getting financial support. In what followed 17 regions took part in this competition, amongst them 'The Virtual Biotech Company'. Set up as a virtual company 'The Virtual Biotech Company' did not win the competition but since this has not been the only goal the members of 'The Virtual Biotech Company' continued in pursuing the aim of becoming one of the top biotechnology 'company' in Europe by the year 2000. 'The Virtual Biotech Company' consists of more than 150 companies, research organisations and public institutions located in one area, jointly pursuing biotechnology projects.

While the idea of setting up a virtual organisation is very innovative and promising it also bears risks due to the wide range of problems virtual corporations might face. The Virtual Biotech Company has chosen the designation 'Virtual Enterprise' for several reasons, e.g.

- appearance as one single company,
- no control agreement,
- no need to found a new establishment,
- ability to adapt structures to changing environment.

## Case Study ‘The Virtual Biotech Company’

Figure 1: Organisational Structure of the Virtual Biotech Company



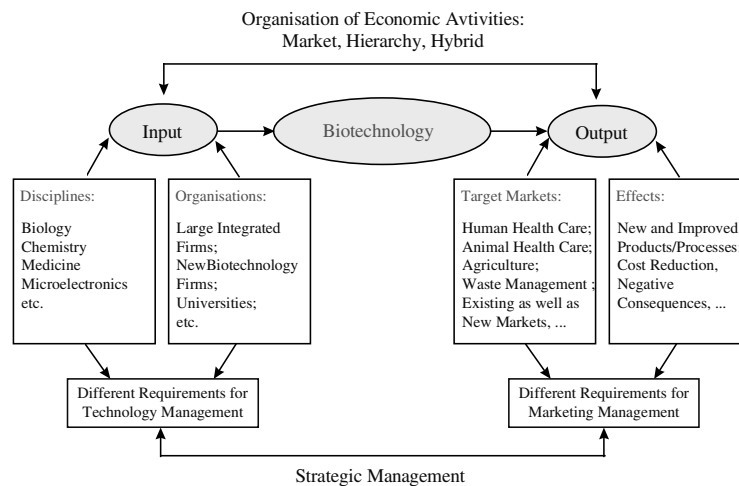
The members of the Virtual Biotech Company cover quite a broad spectrum with respect to e.g. degree of integration and target markets. What they do have in common is the managing of technology in high tech markets, namely biotechnology.

### Biotechnology - High Tech, High Stakes, High Risks

Modern Biotechnology has the potential to improve the future quality of life. It will have (and already has) great influence on e.g. the health sector, food production and the protection of the environment. At the same time, mastering biotechnology will be a major competitive factor in many markets. Designated as a high technology, regional and national governments are encouraging companies and research institutes in doing R&D and promote R&D projects. Uncertainty concerning technical and market success, the complexity of biotechnology R&D projects and the requirement of going international make co-operation a matter of course.

## Case Study 'The Virtual Biotech Company'

Figure 2: Complex Biotechnology



A recent report on the European Biotech Economy (Ernst&Young 1997) shows that all over Europe entrepreneurial bioscience companies are emerging and contributing to the rapid development of biotechnology.

In Germany, the biotechnology boom started with delay. But in the last years new firms have been founded, large integrated companies have given priority to biotechnology R&D and government has taken measures to promote the biotechnology sector.

### Structure, Strategy, and Culture

#### Structure: a frame for co-operation

The „Virtual Biotech Company“ has been initiated by the regional government. The government gives financial support and facilitates the „company“ with a small organisational entity. This core of the virtual company consists of people who have administrative tasks and, above all, the task to propagate the company, to give it an identity and to foster the external contacts with potential clients, and internal contacts between the partners of the virtual company. These „headquarters“ manage the network.

The headquarters have no own products, but fulfil a window function. The partners possess their own know-how and they sell their own products, with or without other partners. The

## Case Study 'The Virtual Biotech Company'

network offers an appropriate structure for fund raising, the organisation of business meetings, biotech conferences, and contacts with the press. An important issue the network can put on the agenda is the ethical aspect of genetic technology. Here also lies added value.

Besides headquarters, the network has:

- an inner circle of „champions“ (about 6 people)
- a board of directors, together with some ministers of the regional government (about 16 people)
- a few working groups on certain issues (one working group has made a booklet on genetic technology)
- 17 teams of specialists with an average of 9 members (only half of the teams are really active).
- 650 people are registered as being interested.

In general, the image of the network is a structure of a highly motivated core, with a large circle of participating organisations and individuals.

### Strategy: from vision to action

The reasons of the government to support the „Virtual Biotech Company“ are the relatively high unemployment in the region and in particular the specific situation in biotechnology: about 3000 biotech scientists, who are considered insufficiently productive. The development of new products lags behind. Besides this collective, political interest, there are separate interests of the participating companies, research institutes and other organisations that participate in the network, for example as a financier. These interests partly coincide: companies can benefit from the efforts of the headquarters in acquisition, in building the biotech-image of the region, in providing information on potential partners, etc.. Partly the interests diverge: companies may be competitors, they may be afraid to lose their intellectual assets, or they may simply be convinced that it is better to work alone. Large companies may be afraid, for example, that they only contribute to the start of new competitors.

Within 1.5 years about 30 innovative projects have been started. These have resulted in a few new companies and about 350 new jobs. This is the beginning of what is to become a leading „bio-company“ in Europe. The function of the network and its headquarters is to support the many existing ideas. These ideas are to be transformed into approved and financed project proposals. When this is the case, a project really starts. It then becomes a matter of the

## **Case Study ‘The Virtual Biotech Company’**

partners involved. The added value of the network organisation lies in the transformation process.

### **Culture: to overcome one’s own strengths**

The companies that participate in the network differ in many respects: size, specialisation, tradition and their orientation on research, production or marketing. Larger companies are usually more capable of coping with complexity and smaller companies are usually more flexible. On these points they can complement each other. Organisations can also offer each other complementary, additional competencies or capacities. In that way they use each other’s strengths. A factor that determines to a large extent the possibility of combining qualities and competencies is the organisational culture. The organisational norms and values and the practices based on them are rather varying within the „Virtual Biotech Company“. The culture of a research laboratory differs a lot from the culture of a production environment, or from the political culture of the regional government agencies. On the one hand, these large cultural differences make co-operation difficult, but on the other hand they can make co-operation fruitful. To establish a fruitful co-operative relationship, communication between the participants is necessary. The exchange of information is not enough. The participants have to learn to understand each other’s strengths and that calls for openness and commitment to the network as a whole. Above all, one has to believe in one’s own strength *and* in its relativity.

## **3 Aims of the Case Study**

The overall theme of the case study is to investigate major problems and issues relating to the concept of a virtual company. The aims of the case study are twofold:

1. The students should gain some understanding of the concept of the ‘virtual corporation’ and should compare this ‘hybrid’ institutional arrangement with ‘the market’ and ‘the hierarchy’ (transaction cost framework).
2. The students should study the ‘Virtual Biotech Company’ and suggest solutions for some of their problems. These selected problems are in the area of
  - commitment
  - marketing
  - project development
  - information management.

## Case Study 'The Virtual Biotech Company'

### 4 The Tasks

#### ***4.1 Discussion Part I: Concept of a Virtual Organisation***

The advantages and disadvantages of different forms of organising economic activities should be discussed and implications for improvements should be derived.

Firms cooperate with certain (network) firms to organise resources (Walker 1997) instead of using 'the market' or 'the hierarchy'. Different forms are for example the 'spherical firm' (Miles and Snow 1995), or the 'virtual company' (Chesbrough/Teece 1996, Picot/Reichwald/Wigand 1996). Central to these forms is that firms specialise in order to build core competencies (Prahalad/Hamel 1992) and that they outsource activities which are not critical to a firm's competitive position. Doing so should increase productivity (Alchian/Demsetz 1972). But, at the same time, it makes a firm more dependent on others. Thus, firms face a dilemma of choosing between boosting productivity through specialisation and keeping enough independence.

Especially in high tech industries, firms might want to learn (Senker/Sharp 1997) about the new technologies in order to catch up with or stay in the leading field.

The transaction cost theory (Williamson 1979, 1985) differentiates institutional arrangements, especially the Market, the Hierarchy and hybrid structures, with respect to its costs: the sum of production costs and transaction costs should be minimised for any economic activity.

Transaction costs occur because of problems of coordination and motivation (Milgrom/Roberts 1992, 29pp.).

The main governance mechanism for the market is the price the seller claims for a his product and the buyer is prepared to accept (other governance mechanisms, such as power, commitment and trust could of course also have an impact on how the transactions are performed in the market). Lack of information and asymmetry of information lead to inefficiency of the price mechanism. Information asymmetry means that one party is better informed than the other, this asymmetry could be used against the less informed. A central governance mechanism within the hierarchy is power. Again, information and implementation problems lead to inefficiency, and other governance mechanisms might be relevant. Other important governance mechanisms for cooperations are, according to Morgan and Hunt (1994), commitment to the relationship and trust. They define relationship commitment as „an exchange partner believing that an ongoing relationship with another is so important as to warrant maximum efforts at maintaining it“ (p. 23) and trust as „existing when one party has confidence in an exchange partner's reliability and integrity“ (p. 23).

## **Case Study ‘The Virtual Biotech Company’**

For the virtual corporation as a hybrid institutional arrangement, the importance of different governance mechanisms should be discussed and potential problems should be outlined.

### ***4.2 Discussion Part II: Selected Problems of ‘The Virtual Biotech Company’***

In what follows four major topics covering typical problems of virtual companies are pointed out. Having talked to ten different members of the ‘Virtual Biotech Company’ some quotations are filled in to reflect diverse attitudes.

#### **Topic 1): Commitment in virtual companies**

##### **a) Background:**

An important question in a virtual company is: What degree of formalisation is necessary in order to appear as a legitimate partner in the market? For the members, using the network should be a matter of course, despite loose cooperation. Since the members of ‘The Virtual Biotech Company’ have their own businesses the added value of the ‘The Virtual Biotech Company’ has to be communicated to the members in order to lead to activities which are performed under ‘The Virtual Biotech Company’.

Where in ‘The Virtual Biotech Company’ market and hierarchy cannot be dominant steering mechanisms, psychological concepts like commitment and trust will have to create unity and a bond.

To achieve commitment ‘The Virtual Biotech Company’ will release a quarterly report. Another instrument could be seen in the visualisation of core competencies to show the role and importance of the members.

There is also a common logo, in which the partners should recognise themselves. And without doubt there are many more ways in which one tries to enhance the commitment to the network.

##### **b) Key issues dealt with in the literature:**

„Organisational commitment implies identification with an organisation and acceptance of its goals and values as one’s own“

Market and hierarchy are the most important mechanisms for management and co-ordination in the classic forms of organisation: the functional organisation, the multidivisional organisation and the matrix organisation (Achrol, 1997). In network organisations,

## **Case Study ‘The Virtual Biotech Company’**

psychological concepts like commitment, trust and motivation are essential in order to understand and to manage the relations between partners. The network organisation is a relatively new form of organisation. It is an answer to developments inside and outside organisations, which are characterised by turbulence and complexity. Organisations have to be efficient, they have to produce qualitatively good products, and they have to be flexible and innovative (Bolwijn & Kumpe, 1998). The traditional mechanisms for management and coordination fall short when all these market demands have to be met. An innovative organisation does not only call for the development of new technologies and applications, but it also calls for (room for) the renewal of forms of organisation. The network organisation, in its many manifestations (e.g., internal market networks, marketing channel networks, intermarket networks, opportunity networks; Achrol, 1997), can be regarded as an organisational innovation that incorporates flexibility.

The attention for commitment does not only spring from the need for new forms of organisation and steering mechanisms. It is also a reaction to the fundamental changes in the bond of employees with their company and their job (Lincoln & Kalleberg, 1990). In terms of Neuijen’s (1992) typology of organisational cultures, we can see that organisations are characterised more and more by an innovative culture, especially organisations with a high level of education. This type of culture is characterised by a critical involvement of the employees. If the vision of the organisation is in tune with the opinions, values and the interests of individual employees, then they will be strongly committed to the company, loyal and willing to identify themselves with the organisation. On the other hand, resistance will be strong in case of conflicting visions. Apart from this innovative culture, Neuijen identifies organisational cultures that are characterised by patterns of internalisation and conformation. These types are characterised respectively by a complete coincidence of the norms and values of the individual employees and the organisation, and by a relation in which loyalty is „bought“ for the period an employee spends within the organisation.

In order to define commitment it is important to distinguish between commitment to the relationship and commitment to the task (Morgan & Hunt, 1994). Commitment to the relationship and trust can be seen as factors of what is called the hybrid type or the institutional arrangement in transaction cost theory. Market and hierarchy, with the factors price and power, are the other types. According to Weisenfeld-Schenk/Reeves/Hunck-

## Case Study ‘The Virtual Biotech Company’

Meiswinkel (1998) price, power, trust and commitment to the relationship together lead to commitment to the task.

When stimulating or managing commitment, it is important to be aware of the social-dynamic processes, which may contain major threats.

- Overformalising commitment pushes ‘responsible autonomy’ to the background, a steering mechanism that is essential for networks, in favour of bureaucracy and power.
- Employees, or partners in the network, can be tempted to overcommitment, a bond with goals and results that is too strong. In enthusiasm and loyalty one is often willing to enter into unrealistic obligations. Overcommitment is especially dangerous if it occurs regularly and becomes part of the culture.
- In case of strong commitment the people involved will cherish high expectations regarding the co-operation and its results. The danger of a high threshold for satisfaction is very big then.
- Commitment to the relationship should have the opportunity to grow. It is hard to gain, but easy to lose.
- Within networks of companies that co-operate only incidentally and ad hoc, time and motivation lack to build commitment to the relationship. There is a danger that companies fall back upon the classic mechanisms of market and hierarchy in order to achieve sufficient commitment to the task. In the long run this does not generate the bond that is desirable in a network.

### c) **The Problem:**

The degree of commitment or the consciousness of being committed varies among ‘The Virtual Biotech Company’ members.

*„Actually, we do not need the ‘Virtual Biotech Company’ for our main business. We wouldn’t use the Logo when advertising worldwide or even in Germany. But it brings partners together and we are promoting the ‘topic biotechnology’ in the area.“*

The joined project of developing an approval guide (‘Leitfaden Genehmigungspraxis’) might serve as an example of a problem: This written guidance has been developed within ‘The Virtual Biotech Company’, but its publication does not reflect this.

*„They didn’t use our Logo, nobody would know that it was the ‘Virtual Biotech Company’ developing jointly the guide“*

## **Case Study ‘The Virtual Biotech Company’**

Some members of ‘The Virtual Biotech Company’ have strongly criticised this while others did not put so much emphasis on it. The reasons for joining ‘The Virtual Biotech Company’ are quite different among the members.

*„Of course, different members have different expectations: the industry wants to improve efficiency, science wants grants, and the politicians want to raise the employment rate.“*

It seems that some members joined ‘The Virtual Biotech Company’ not because of the potential benefit but rather because it doesn’t harm to join. There is no membership fee, no letter of intent or any obligation when joining ‘The Virtual Biotech Company’. But especially the key actors of the ‘Virtual Biotech Company’ are very enthusiastic about the ‘Virtual Biotech Company’.

*„Now we are talking to people in this region we would never have talked to without having founded the ‘Virtual Biotech Company’.*

### **d) The Task:**

The group should develop or improve instruments to achieve commitment, and describe the steps for implementation.

### **e) Literature**

- Achrol, 1997.
- Bidault & Cummings, 1994.
- Bolwijn & Kumpe, 1991.
- Lincoln & Kalleberg, 1990.
- Morgan & Hunt, 1994.
- Neuijen, 1992.
- De Weerd-Nederhof, Fisscher & Kerssens-Van Drongelen, 1995.
- Weisenfeld-Schenk, Reeves & Hunck-Meiswinkel, 1998.

## **Topic 2): Marketing**

### **a) Background:**

Like a ‘real firm’, a virtual company should make clear to customers what it sells and should communicate this to its members. But, especially for virtual companies developing a joint understanding of ‘who are we’ and ‘what do we want’ is crucial for the success of this loose

## **Case Study ‘The Virtual Biotech Company’**

cooperation. Thus, marketing in a virtual company is twofold: it has to fill members with enthusiasm (**‘Marketing within ‘The Virtual Biotech Company’**) and it has to bring its products to the market (**‘Marketing for ‘The Virtual Biotech Company’**). In this respect, there is a similarity with marketing in non-profit organisations.

### **Marketing within ‘The Virtual Biotech Company’:**

‘The Virtual Biotech Company’ can be seen as an innovation system, as a system for commercialising know how. With ‘The Virtual Biotech Company’, organisations are enabled to pursue complex research projects, bring R&D results to market and combine different strengths in such a way that strong competitive positions in the world market can be reached. These are main assets of ‘The Virtual Biotech Company’. To strengthen the region means to strengthen every single firm. Thus, while the importance of ‘The Virtual Biotech Company’ for the partners should be clear theoretically, its merits should be communicated to its members.

Important aspects are building a ‘corporate identity’ and encouraging communication.

### **Marketing for ‘The Virtual Biotech Company’:**

The complexity of today’s R&D projects and the frequent necessity of pursuing international marketing strategies require pooling resources and competencies. Here, the specific assets of a virtual company, especially its flexibility and ability to handle complex projects provide the opportunity to become the leading ‘player’ in the market. Thus, the specific and at the same time diverse competencies and the high amount of resources of ‘The Virtual Biotech Company’ have to be demonstrated in the market. The difficulty lies in

„the need to use informality and vagueness to gain commitment from diverse interests, and the need to demonstrate formalisation of managerial practices to acquire legitimacy...“ (from customers) (Middleton Stone/Greer Brush 1996, p. 633).

## **b) Key issues dealt with in the literature:**

### **Marketing within ‘The Virtual Biotech Company’**

Ambiguity, Diverse Interests, Legitimacy, Commitment, Relationship Marketing

More than twenty years ago Kotler (1972) has made a differentiation between ‘outside marketing’ and ‘inside marketing’ and has emphasised that marketing „can be used in multiple institutional contexts“ (p. 48). In the eighties the term ‘internal marketing’ has been discussed especially in the area of service marketing (for example Berry 1980,

## **Case Study ‘The Virtual Biotech Company’**

Grönroos 1983), thereby recognising the great importance of the employees’ motivation and satisfaction for achieving customer satisfaction. The benefit of a relationship has mutually to be recognised as being beneficial (Czepiel 1990). This is especially true with respect to networking. The partners of the network will only be committed to this relationship if they perceive the collaboration as being beneficial to them. Barriers to membership as well as to playing an active role in the network are for example

- ambiguity about the gain of networking,
- fear of becoming too dependent,
- chance of other members’ free-riding behaviour.

Kanter (1994) draws attention to the ‘human terms’ of managing a partnership and proposes ‘The Eight ‘I’s’ That Create Successful ‘We’s’:

- Individual Excellence: the partners have to be strong and they should have something of value to contribute,
- Importance: the collaboration must be important for reaching long term goals of the partners,
- Interdependence: the partners should realise the difficulty of accomplishing alone what the collaboration can do,
- Investment: commitment should be demonstrated by devoting resources to the relationship,
- Information: the information necessary to make the relationship work has to be shared (open communication),
- Integration: connections should be built at different organisational levels,
- Institutionalisation: a formal status is needed, as well as clear responsibilities and decision processes,
- Integrity: the partners have to be careful with the information they handle and not undermine each other.

## **Marketing for ‘The Virtual Biotech Company’**

Long Term Success, Industry Standards, Brand Building, Systemic Innovation, Market Orientation

## Case Study ‘The Virtual Biotech Company’

### c) The problem:

#### Marketing within ‘The Virtual Biotech Company’

The following points should be made clear in order to fill members with enthusiasm:

- who are we
- what do we want
- what are our strengths and weaknesses

*„Our mission is to become the number one biotechnology company by the turn of the century“*

#### Marketing for ‘The Virtual Biotech Company’

How to present the region as a highly attractive service pool

*„We started a public relations activity in the pedestrian area of that city and we took a video of that. This is an example of one piece of a puzzle. So far, we do not have an integrated marketing strategy“.*

### d) The Task:

#### Marketing within ‘The Virtual Biotech Company’

Showing goals of the virtual company and developing future strategies to reconcile diverse interests in order to develop a ‘campaign’ for ‘inspiring’ the members (‘creative representation’).

#### Marketing for ‘The Virtual Biotech Company’

The group should develop a strategy how to build a brand and how to represent ‘The Virtual Biotech Company’ to the outside world.

## Literature

- Achrol, 1997.
- Middleton Stone & Greer Brush, 1996.

## Case Study ‘The Virtual Biotech Company’

### Topic 3): Project Development

#### a) **Background:**

In order to regularly innovate a continuous flow of marketable R&D results has to come up. But there are too few projects which are brought to market. Within the ‘The Virtual Biotech Company’, 3000 scientists are working on research projects, but up to now, around 30 projects p.a. are brought to market, i.e. have become innovations. This might for example be due to a lack of market orientation, a lack of motivation for innovation, or doubts about the success in the market. Key aspects are motivating for innovation, encouraging market orientation, and providing market analyses.

#### b) **Key issues dealt with in the literature:**

Interface Management, Functions and Roles, Co-ordination, Boundary Spanning, Barriers, Interdisciplinary

#### c) **The problem:**

How to enlarge the number of innovation projects, how to improve and accelerate the innovation process.

*„How can we require of the scientists to ‘deliver’ marketable projects?“*

*„They do not know the potential of their projects, one has to show them the potential market success“.*

#### d) **The Task:**

The group should describe possible mechanisms of coordination and should develop a guide for doing market analyses for ‘The Virtual Biotech Company’ projects.

#### e) **Literature**

- Brockhoff, Chakrabarti, Hauschildt & Pearson, 19

## Case Study 'The Virtual Biotech Company'

### Topic 4): Information Management

#### a) Background

Feeding 'The Virtual Biotech Company' with up-to-date information, spreading the information while avoiding information overload are key success factors, not only for virtual companies but for any company. But, members of virtual companies face the special problem of finding the balance between keeping confidential information and giving necessary information. The relevance of information is time-dependant. Strong competitive positions in the world market imply timely innovation. That means that often even vague information on research results could be crucial for being first on the market.

#### b) Key issues dealt with in the literature:

Interfirm Openness, Sharing, Competence, Trust, Anxiety, Negative Attitudes

#### c) The problem:

The Virtual Biotech Company has a central database but unfortunately this is not available for all members so far. In addition, the virtual enterprise is present in the internet, but the internet pages does not give information about the technical expertise.

*„There is a tension of sharing enough and keeping confidential information: on the one hand, sharing information should lead to mutual benefit (gaining insights, getting access to resources), on the other hand, keeping proprietary know how is crucial in order to not strengthen the competitors but rather reap the fruits of research“.*

A delicate task is presenting (technical) information in a way to facilitate technology transfer and interaction between members while managing the balance of confidential and necessary information.

#### d) The Task:

- To elaborate on how to motivate members to give information, how to make information accessible and how to balance between necessary and confidential information. To develop an 'early warning system' capable of: channeling information about projects coming up, ensuring feed back, automation of information flow.

#### e) Literature:

- Buono, 1997.
- Miles & Snow, 1995.

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