POST-ACQUISITION INTEGRATION OF SMALL BIOTECHNOLOGY FIRMS IN THE STRUCTURE OF LARGE PHARMACEUTICAL COMPANIES

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List of acronyms

ADR	American depository receipt
AG	Aktiengesellschaft [corporation]
AIDS	Acquired Immune Deficiency Syndrome
BCG	Boston Consulting Group
BIO	Biotechnology Industry Organization
CA	California
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CHF	Swiss Franc
Corp.	Corporation
CRO	Clinical Research Organization
DBF	Dedicated Biotechnology Firm
Dipl.-Kfm.	Diplom-Kaufmann [Master of Science in Business Administration]
DNA	Deoxyribonucleic acid
e.g.	for example
EASDAQ	European association of securities dealers automated quotation
ed.	Edition
Ed.	Editor
ELISCO	Entrepreneurial life science company
EU	European Union
FDA	Food and Drug Administration
GTI	Genetic Therapy, Inc.
HTTP	Hypertext transport protocol
i.e.	That is
Inc.	Incorporated
IPO	Initial public offering
KGaA	Kommanditgesellschaft auf Aktien [Limited partnership on shares]
M&A	Mergers and Acquisitions
M.B.A.	Master of Business Administration
MA	Massachusetts
MD	Maryland
NAD	Nucleic Acid Diagnostic
NASDAQ	National association of securities dealers automated quotation
NBF	New Biotechnology Firm
NC	North Carolina
NJ	New Jersey
OECD	Organization for Economic Cooperation and Development
OTA	Office of Technology Assessment
OTC	Over-the-counter
R&D	Research and Development
RDNA	Recombinant deoxyribonucleic acid

S.A.	Société Anonyme [corporation]
SEC	Security and Exchange Commission
SIC	Standard Industrial Classification
U.K.	United Kingdom
U.S.	United States
VFA	Verband Forschender Arzneimittelhersteller e.V.
Vol.	Volume
VP	Vice President
WWW	world wide web

1 Introduction and structure of the research

> *"We know surprisingly little about mergers and acquisitions, despite the buckets of ink spilled on the topic. In fact, our collective wisdom could be summed up in a few short sentences: acquirers usually pay too much. Friendly deals done using stock often perform well. CEOs fall in love with deals and don't walk away when they should. Integration's hard to pull off, but a few companies do it well consistently." (Bower, 2001, p. 93)*

Mergers and acquisitions are among the most dramatic and visible manifestations of strategy at the corporate level. With a single deal, the strategic course of the organizations involved can be altered permanently. Acquirers can gain immediate access to technologies, products, distribution channels, personnel and desirable cost and market positions. Moreover, acquisitions can bring into a company capabilities the organization finds hard to develop and can also provide the opportunity to leverage existing capabilities into much more significant positions. The M&A phenomenon shows no signs of slowing and has even embraced the high-technology sectors where it was formerly rare. M&A is increasingly becoming a more integral part of business life. The idea of 'mega deals' is haunting the top floors of the world's largest companies. Every day new deals are announced, and various stakeholders greet them with reactions ranging from euphoria to skepticism.

- On the 4th of September, 2001 Hewlett Packard (HP) has announced the acquisition of Compaq in a deal worth $21.4 billion.
- In 2000, Vodafone AirTouch has acquired the German telecommunications and engineering Group Mannesmann in a deal worth $173.25 billion.
- Since 1992, Tyco International has acquired and integrated more than 110 companies.
- Between 1993 and 2000, Cisco Systems has made 65 acquisitions of small high-tech start-ups with deal amounts between $40 million and $450 million.

Mergers and acquisitions are justified by the extent to which they add value. Despite the important role which acquisitions play in most discussions of

corporate strategy, a harsh reality underlies the M&A activities, whether it be high- or low-technology industries: more than half of these transactions fail. Kay (1993) has summarized major studies about the performance of mergers and acquisitions and has come to the overall conclusion that "taken as a whole, merger activity adds very little value" (Kay, 1993, p. 146). The following Figure 1 provides an overview of the studies considered by Kay (1993).

	Method of evaluation	Major Studies	Conclusions
1.	Subjective opinions of company personnel	Hunt et al. (1987)	Around half are successful
2.	Whether acquired business is retained in the long term	Ravenscraft & Scherer (1987)	More are divested than retained
3.	Comparison of overall profitability before and after merger	Meeks (1977) Mueller (1980) Ravenscraft & Scherer (1989) Cosh et al. (1990)	Nil to negative effect
4.	Effect on stock market valuation	Franks & Harris (1986) Franks, Harris, & Mayer (1988)	Positive initial impact

Source: Kay (1993), p. 148

Figure 1: Performance of mergers

However, none of this evidence should be interpreted as indicating that no merger is ever successful. But, it is necessary to ask why do mergers perform poorly or even do fail completely. A recent study of McKinsey (Bekier, Bogardus & Oldham, 2001) has pointed out that many companies lose their revenue momentum after the acquisition as they concentrate on cost synergies or fail to focus on post-merger growth in a systematic manner. In fact, only 12% of the companies in the sample of the McKinsey study managed to accelerate their growth significantly over the three years following the merger. A study of A.T. Kearney has come to the conclusion that the post-merger integration phase bears the greatest risk in an acquisition (Habeck, Kröger & Träm, 2000). This point of view is corroborated by a study of Bain (Duelli, 2000), which revealed that more than half of all merger and acquisition failures are caused by faulty post-merger/post-acquisition integration activities. Besides a fragmented perspective

and unresolved expectations, Jemison & Sitkin (1986b) identify the limited consideration of integration issues as one of the major reasons for unsuccessful M&A activities. The second major reason that is often discussed in this context is the overestimation of potential synergies that are supposed to result out of an acquisition (Sirower, 1997; Coenenberg, 1988; Chatterjee, 1986). However, Buono & Bowditch (1989) have pointed out that

> *"because of the myriad questions about merger and acquisition success, attention has begun to shift toward human resource concerns, the cultural ramifications of merger activity, management of overall combination process, and specific efforts aimed at post-combination integration". (Buono & Bowditch, 1989, p. 10)*

Furthermore, a study of Chakrabarti (1990) has found that post-merger performance depends even more on post-merger integration than on strategic fit, because organizational factors intervene and essentially determine which of the pre-merger potentials are really achieved and which are not.

Although there is a lot of literature from strategy researchers or financial economists in which M&A activities have been analyzed from different perspectives, the issue of post-merger integration is still a rather neglected one. Some of these studies have been done in the context of the market for corporate control (Jensen & Ruback, 1983; Jarrell, Brickley & Netter, 1988), whereas others have investigated the specific performance or success of the acquiring/acquired company, sometimes also linked to a specific type of acquisition (Seth, 1990a & 1990b; Ansoff et al., 1971; Möller, 1983; Agrawal, Jaffe & Mandelker, 1992; Lubatkin, 1983; Shelton, 1988; Ahuja & Katila, 2001). Another set of studies has coped with the broader question, whether mergers and acquisitions do create value under the influence of certain variables (Schmush, 1998; Jarrell & Poulsen, 1994; Datta, 1991; Healy, Palepu & Ruback, 1992; Markides & Oyon, 1998; Rad & Beek, 1999; Fowler & Schmidt, 1989; Shanley & Correa, 1992; Datta, Pinches & Narayanan, 1992; Lubatkin, 1987), or of which steps the M&A process should consist (Jansen 1998; Gomez & Weber, 1989; Ivancewich, Schweiger & Power, 1987; Hunt & Downing, 1990; Kübler, 1996).

Despite this broad body of literature, the issue of post-merger integration, which is closely linked with the complex organizational implications of acquisitions, has

been rather widely neglected. This fact has already been pointed out with the introductory quotation of Bower (2001). In addition to that, some other authors (Shrivastava, 1986; Napier, 1989; Hunt & Downing, 1990; Gerpott, 1993; Chakrabarti, 1990; Seed III, 1974; Davidson & Neumann, 1997; Haspeslagh & Jemison, 1987 & 1991; Deiser, 1994; Walsh, 1989; Inkpen, Sundaram & Rockwood, 2000) also emphasize the importance of the post-acquisition integration strategy and support the need for further research in this context:

> *"Improving the acquisition integration process, however, may be one of the most urgent and compelling challenges facing business today." (Ashkenas, DeMonaco & Francis, 1998, p. 166)*

Already almost 40 years ago Mace & Montgomery (1962) stated the following:

> *"The values to be derived from an acquisition depend largely upon the skill with which the administrative problems of integration are handled. Many potentially valuable acquired corporate assets have been lost by neglect and poor handling during the integration process." (Mace & Montgomery, 1962, p. 230)*

After having seen, that mergers and acquisitions have become an integral part of business life, on the one hand, and that more than half of mergers and acquisitions fail, primarily because of a poor post-merger or post-acquisition integration strategy, on the other hand, this study will put its analytical focus on the post-acquisition integration of small biotechnology companies into the structure of big pharmaceutical companies. The two questions that arise now are: (1) Why is it necessary to focus on the post-acquisition integration issues between pharmaceutical and biotechnology companies? (2) What contributions can this analysis make to the topic of post-merger integration?

To start with, biotechnology is one of the most important technologies to have emerged over the last twenty years. Today, this growing industry comprises a range of companies from research-focused start-ups to mid-size companies with manufacturing capability and large pharmaceutical companies. Along with information technology and new materials technology, it is, in fact, considered to be one of the 'generic' technologies which will underpin much future industrial growth. Hence, biotechnology's novelty and scope inevitably cause considerable turbulence and changes within firms, and, particularly, in the relationships

between firms relying on it. The rapid changes in the pharmaceutical industry occurring as a result of biotechnology's development provide the context of this study. One important question is why these two industries are of such high analytical interest. The simplest and also most obvious answer lays in the most fundamental need of mankind: the will to survive. The discoveries of the pharmaceutical and biotechnology companies help to reduce mortality and to prolong life. This can surely be considered as one of the most important needs, if not *the* need of all human beings. Some contributions pharmaceutical discoveries have already achieved are indicated in Figure 2:

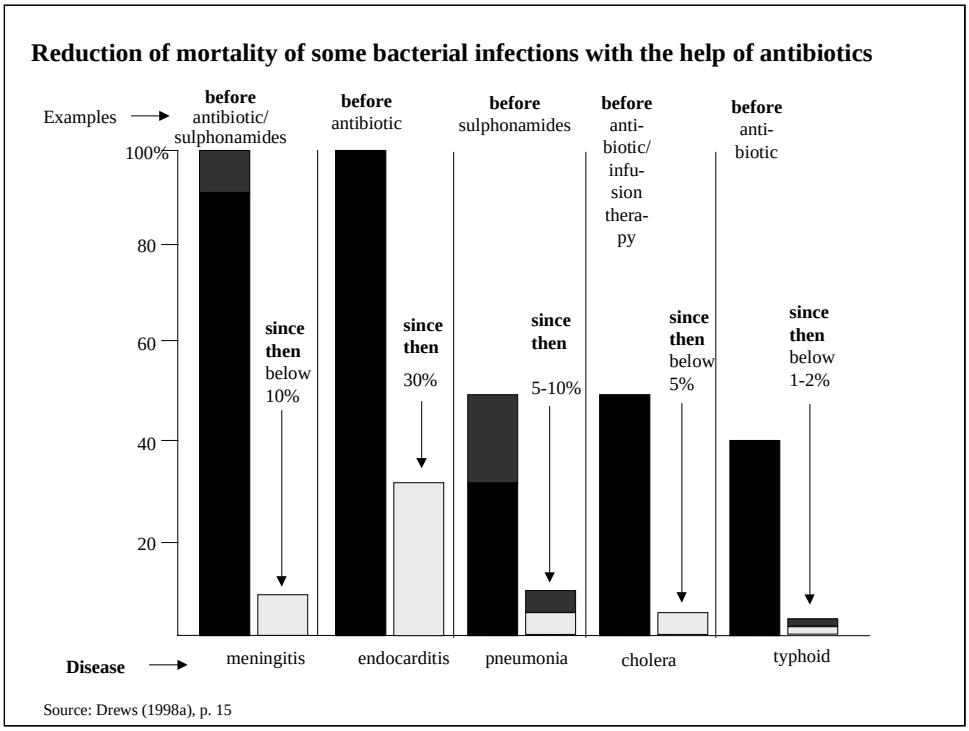

Figure 2: Contributions of pharmaceutical discoveries

Apart from that, the pharmaceutical industry is undergoing a consolidation process. This process is characterized by M&A activities between large pharmaceutical companies such as SmithKline Beecham and Glaxo Wellcome, on the one hand, and the acquisition of small biotechnology companies like Sugen by Pharmacia, on the other hand.[1] The merger activities between pharmaceutical companies are primarily motivated either by achieving operational improvements or by getting a specific product. In contrast to this, the

[1] These issues will be discussed in more detail in Chapter 3.

acquisition of biotechnology companies takes place, because the pharmaceutical companies want to get access to the knowledge and research capabilities embedded in the biotechnology companies. Thus, pharmaceutical companies are involved in a multitude of M&A activities that demand a great variety and combination of different skills and concepts which could also be very interesting for other industries.

The title of this study – 'Post-acquisition integration of small biotechnology firms into the structure of large pharmaceutical companies' – points out the further analytical focus. The emphasis will be put on how a smooth organizational integration of the biotechnology companies into the organizational structure of pharmaceutical companies can be ensured in order not to endanger the innovative capabilities and the loss of the key knowledge holders at the biotechnology companies. Pharmaceutical companies have a severe problem when facing the need to integrate an acquired biotechnology company. On the one hand, they need to integrate the biotechnology company to some extent in order to be able to profit from the capabilities of the newly acquired company. But on the other hand, these capabilities are very context-specific and cannot simply be transferred from the biotechnology company to the pharmaceutical company. Thus, the pharmaceutical companies face the paradox, that they need to integrate the biotechnology companies in some way in order to get access to the desired capabilities, whereas, on the other hand, they need to preserve the autonomy of the biotechnology company in order not to endanger the future existence of the desired capabilities.[2] This study will analyze how pharmaceutical companies have handled this paradox by investigating five different M&A case studies with special regard to their specific post-acquisition integration activities.

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[2] Zaby (1999) analyses the international biotechnology activities of Bayer AG. In this context some aspects are very interesting for this study. In 1978, Bayer acquired Miles Laboratories that also had a small presence in West Haven, Connecticut, close to Yale University in New Haven. Bayer entered into a joint venture with a group of young professors from Yale University in order to learn from the organizational structure of a biotechnology company which was a novel concept for European pharmaceutical companies at that time. However, Bayer was not able to sustain the entrepreneurial spirit of the biotechnology company during the cooperative phase and even much less after the full acquisition and integration of the joint venture into Miles Laboratories.

Therefore, the goal of this study is to shed light on this phenomenon, to explore how a successful post-acquisition integration between small start-ups and large corporations can be realized in the specific context of a knowledge-intensive, innovation-driven and capability-focused high-technology industry. Because the few existing studies about post-merger integration, such as e.g. Haspeslagh & Jemison (1991) or Shrivastava (1986), have not yet analyzed this paradox, this study tries to close that gap by providing a framework for the integration of small high-technology companies into the structure of large corporations. Such research is explorative in nature, because not enough is known about the post-acquisition relationships between small biotechnology firms and large pharmaceutical companies in order to perform large-scale hypotheses testing research using quantitative analysis. Instead, this study aims at developing a set of rigorously formed hypotheses that have the potential to extend extant post-merger and post-acquisition theory and that lend themselves to subsequent tests. The overall aim of this study is to further the theory of post-acquisition integration by developing a framework for the development of a successful integration strategy of small high-technology companies into the structure of large companies.

Since very little is known about the different post-acquisition activities between biotechnology and pharmaceutical companies, a considerably detailed approach is called for. A contextually rich description of the biotechnology and pharmaceutical industry, of the firms operating in them, and of their M&A activities is needed if a deeper understanding is to be gained. Thus, detailed descriptions are indispensable for eventually creating rich theoretical insights. Hence, the research approach selected for the purpose of this study is descriptive, holistic and to some extent also longitudinal. However, it is even more than that, because this study is also analytic in nature. It does not only ask ‘what’ questions, it especially asks ‘why’ and ‘how’ questions. The appropriate research methodology for a study that attempts to extend existing post-merger and post-acquisition integration literature by description and analyses is the comparative case study research methodology (Eisenhardt, 1989). This brief introduction of the methodological foundation may suffice at this point, since Chapter 2 contains a profound discussion of the selection and the application of the comparative case study methodology. This section will also explain the research process itself.

Furthermore, one other topic must be considered in the course of this introductory chapter. It is the inevitable topic of terminology, which will be limited to a short, yet concise, explanation of some key terms. In this section, however, there will be no explanations about what is understood by either the biotechnology or the pharmaceutical industry, since this will be done in the context of the respective sections concerned with building industry context (Chapter 3.1). Instead, this section will now focus on a terminological foundation around everything that deals with the terms ‘mergers’ and ‘acquisitions’.

Although the terms ‘mergers’ and ‘acquisitions’ do not describe the same thing, the growing literature in this field suggests that they are homogeneous in nature and typically have the same repercussions for the firms (Schweiger & Ivancevich, 1987). Therefore, the terms ‘mergers’ and ‘acquisitions’ are used interchangeably in most discussions. That is also the approach taken in the context of this study, in which the terms ‘mergers’ and ‘acquisitions’ will be used synonymously. Nevertheless, it is necessary to point out the specific differences and meanings of these expressions. In a more technical sense, ‘acquisition’ describes any transfer of ownership, whereas ‘merger’ describes a transfer of ownership in which one entity legally disappears into the other, or both entities disappear into a third entity created for the purpose of the merger (Lajoux, 1998). In other situations, the word ‘merger’ is used to mean the union of two companies of substantially equal size involving a high degree of cooperation and interaction, while the word ‘acquisition’ refers to the combination of a large company with a much smaller one.

The difference between mergers and acquisitions, however, tend to be much more than technical and semantic in nature. Mace & Montgomery (1962) found when talking with the executives of a target firm that management representatives of the acquiring company always referred to a ‘merger’ of the two firms, although it was implicit and apparent that the one firm proposed to acquire the other. In the respective situation the negotiating executives of the acquiring company would talk about ‘merger’ with the management of the company to be acquired, but when discussing this opportunity with their board of directors, they referred invariably to the possibility of ‘acquisition’. In the words of Mace & Montgomery (1962):

> *"There seemed to be an inoffensive quality in the word 'merge' not found in the word acquire. As one executive stated, 'The reasons for the difference are unclear, but management find comfort in the merging of mutual interests. Being acquired connotes being had!'" (Mace & Montgomery, 1962, pp. 3-4)*

For analytical purposes, it is usual to consider mergers and acquisitions in terms of the extent to which the activities of the acquired organizations are related to those of the acquirer. This kind of classification proposes four main types of mergers and acquisitions (Walter, 1985; Hovers, 1973; Kitching, 1967):

- *Vertical* M&A is the combination of two organizations from successive processes within the same industry with an actual or potential buyer-seller relationship. In this context, an organization may chose to acquire a supplier (backward integration) or a firm that could distribute its products (forward integration).

- *Horizontal* M&A comprises the combination of two similar organizations in the same industry and often occurs, when the firms involved produce one or more of the same or closely related products or services in the same geographic area.

- *Conglomerate* M&A occurs when the acquired organization is in a completely unrelated field of business activity. The rationale usually cited for such acquisitions is that the combination opens entry into an attractive business or industry and spreads the company's risk.

- *Concentric* M&A is when the acquired organization is part of an unfamiliar, but related field into which the acquiring company wishes to expand. This kind of M&A activity is often referred to as product extension and occurs, when the acquiring and acquired companies are functionally related in a field, but sell product or services that do compete directly with one another.

Napier (1989) suggests that mergers can also be considered as falling into three main types, depending on the degree of integration necessary, if the merger is to achieve its objectives. These types are described as follows:

- In *extension* mergers the acquiring organization does not intend to change, other than perhaps minimally, the way in which the acquired company

transacts its business. This approach is also referred to as ‘hands off’ approach.

- In *collaborative* mergers the success is dependant upon the integration of operations (‘synergy mergers’) or exchange of technology or other expertise (‘exchange mergers’).

- In *redesign* mergers the acquiring organization intends to introduce widescale changes, whereby the acquired company totally adopts the practices and procedures of the acquirer.

The terms ‘post-acquisition’ or ‘post-merger integration’ refer primarily to the art of combining two or more companies – not just on paper, but in reality – after they have come under common ownership. Integration refers to a combination of elements that results in wholeness. Moreover, integration occurs at several levels, e.g. by combining the accounting systems of the two firms or by creating a single legal entity. Other important issues may be the integration of physical assets, product lines, production systems, technologies, or the cultural integration. Not all these types of integration are always achieved or even necessary for acquired organizations to function. The necessary degree and fields of integration are determined by a variety of contingencies which will be discussed at a later point of this study. Apart from that, it is necessary to mention that – in the context of this study – the general use of the term ‘integration’ is not able to catch all dimensions, because the ‘integration’ of the small high-technology companies comprises two different aspects. On the one hand, this means the necessary degree of integration of the acquired company into the structure of the acquiring company in order to add value. On the other hand, this refers at the same time to the necessary degree of autonomy for the small high-technology company in order to ensure the future existence of the small company’s capabilities which made the large company acquire it.

One of the key challenges in managing acquisitions is to ensure that acquisitions support the firm’s overall corporate renewal strategy (Haspeslagh & Jemison, 1991), because in most cases acquisitions are strategic decisions that can both reinforce and change a firm’s direction. Hence, acquisition decisions must be consistent with the firm’s strategy. The acquisition activity analyzed in this study

aims at such strategic acquisitions, because all biotechnology acquisitions that were analyzed aimed at reinforcing the current strategy of the acquiring pharmaceutical company.

At this point of the introduction – after having dealt with the most fundamental terminological issues – one might typically expect a section that deals with an overview of the existing literature. However, in the context of an exploratory study – like this – the recommendations of leading case study methodologists are different. They favor an ideal of theory free research (Eisenhardt, 1989 & 1991; Yin, 1984; Dyer & Wilkins, 1991) – however feasible this in reality may be. Due to these recommendations, the subsequent chapter (Chapter 2) leads directly to the research methodology and Chapter 3 to the description of the pharmaceutical and biotechnology industry as well as the different case studies.

The focus of this study was chosen to better understand what happened when pharmaceutical companies acquired biotechnology companies and subsequently had to decide about the transfer of skills, knowledge, resources, and ways of managing to improve their relative competitive position with respect to their newly acquired business. Analyzing these post-acquisition integration activities involves a lot of time and energy, and also requires attention to detail. This study leads to a framework for the post-acquisition integration of small high-technology companies into the structure of large corporations as well as insights into the integration problems that managers of pharmaceutical and biotechnology companies encounter when they try to combine their activities.

This study is organized as follows (cf. Figure 3): Before the cases can be presented, a set of research questions must be specified that guide the entire research process from field work to case description and analysis to theory extension. Thus, the necessary formulation of these questions will be done in the following Chapter 2, which also introduces the research methodology and research design of this study. Chapter 3 deals with the profound description and analyses of the cases embedded in their industry context. Only after a rich and theoretically unbiased understanding of the post-acquisition integration activities has been gained, extant theories are confronted with the case findings (Chapter 4). The frequently propagated procedure of postponed literature review will lead

to the extension of theory and contribute to the construction of a new framework (Chapter 5).

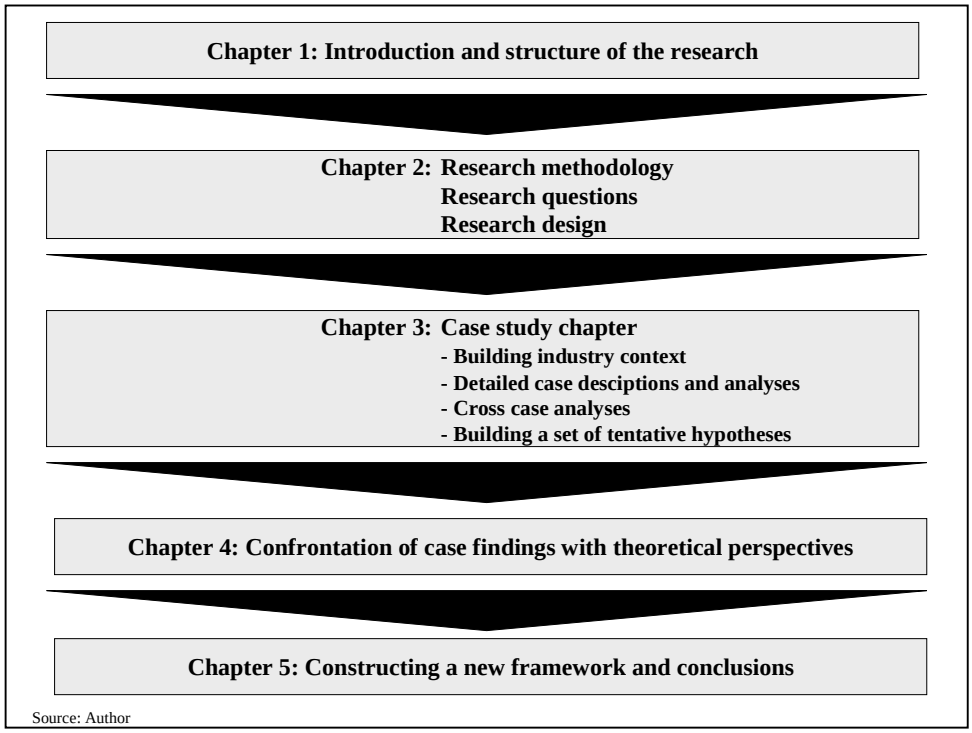

Figure 3: Structure of the study

2 Research methodology

> *"For the most part, the cases of interest in education and social service are people and programs. Each one is similar to other persons and programs in many ways and unique in many ways. We are interested in them for both their uniqueness and commonality. We seek to understand them. We would like to hear their stories." (Stake, 1995, p. 1)*

This chapter starts with explaining the research methodology of this study. This explanation draws on the writings of several case study research methodologists and demonstrates the actual application of their recommendations in a real-life study. Section 2.1 aims at being of value to the reader in evaluating the methodological foundation of this study. The subsequent section (2.2) concentrates on the particular research design of this study.

2.1 Research question and methodology

The research of this study starts from a perceived inappropriateness of existing studies in the field. In the context of post-acquisition integration activities, where testable theoretical propositions have not been sufficiently developed, the paradigm of critical rationalism, as proposed for example by Popper (1976), seems inappropriate. This paradigm considers the purpose of scientific research as explaining reality by formulating theories and then attempting to falsify them (Kretschmann, 1990). However, falsification is hardly possible when relatively few hypotheses on a phenomenon have been stated. Thus, for this study, theory-building using mainly qualitative research is much more appropriate than theory-testing (Eisenhardt, 1989; Snow & Thomas, 1994).[3] Qualitative research has become increasingly accepted in disciplines such as psychology, sociology and business administration (Miles & Huberman, 1994).

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[3] E.g., Gioia & Pitre (1990) argue for a multiparadigm approach to theory building as a means of establishing correspondence between paradigms and theory-construction efforts. From their point of view, qualitative research corresponds to 'theory-building in the interpretative paradigm', whereas quantitative research is viewed as 'theory-building in the functionalist paradigm'.

Moreover, qualitative and quantitative research differ in more than their research methodology and data analysis. On the one hand, qualitative research is often characterized as interpretative, whereas quantitative research is considered as being positivist. Thus, regarding qualitative research as interpretative might even imply that quantitative research is not interpretative. Although the selection of specific variables as likely causes of some designated effects, the formulation of hypotheses, and the use of statistics might create this impression, the design of the research strategy as well as the subsequent interpretation of the collected data have both interpretative aspects (Eisenhardt & Bourgeois III, 1988).

Because of convenience – and perhaps of an aura of rigor – there is an undeniable temptation to conduct cross-sectional research that ”proceeds from a distance, with a remote researcher gathering abstract data from organizations he knows almost nothing about” (Miller & Friesen, 1982, p. 1014). This study takes a different approach.

> *”Longitudinal research seems to enable us to obtain a sounder understanding of organizations. It puts us in a better position to establish causal relationships, to take into account the most important variables, and to ensure that we do not overgeneralize by lumping very different organizations together.” (Miller & Friesen, 1982, p. 1014)*

With the help of within-case and cross-case analyses the goal is pursued to find diverging as well as similar patterns of integration activities on the basis of which tentative hypotheses can be formed. The end result – a set of tentative hypotheses – represents the actual goal of this case study’s work describing and comparing several integration processes. This study’s longitudinal aspect stems from the fact that the aim is to ‘reconstruct’ the acquisition and especially the post-acquisition integration process between biotechnology and pharmaceutical companies.

According to Yin (1984) “defining the research question is probably the most important step to be taken in a research study” (p. 19). Stake (1995) refers to the ‘research question’ also as ‘issue question’ or ‘issue statement’. The central research question of this study focuses on how the post-acquisition integration between biotechnology companies and big pharmaceutical companies takes place. In this context, it is necessary to consider what consequences this implies for the knowledge transfer and the organizational changes that might affect the

innovative and organizational competencies and flexibility of the acquired company. In analyzing and trying to answer this question the following research fields, which can also be considered as kind of sub-research questions, which Stake (1995) refers to as 'topical questions', are of great interest:

1. the impact of motives, sequence and timing of the M&A process on the integration process,
2. the analysis of the integration process itself with respect to the dimensions of:
   - strategic integration,
   - organizational/structural integration,
   - knowledge/competence transfer,
   - cultural integration,
   - personnel/HR integration, as well as
3. the organization of the integration process itself.

The set of research questions guides the entire research process from field work to case description over analysis to theory extension. Moreover, it helps the investigator to specify the kind of organization to be approached, and the kind of data to be gathered. The formulation of the research question is crucial, because, on the one hand, the researcher may risk to become overwhelmed by the complexity of the data with questions that are too broad and general in nature, and, on the other hand, with questions that are too focused, too specific the issue of bias reappears. In such a dilemma situation a carefully compromising solution appears appropriate and, in fact, is proposed by Eisenhardt (1989). The research questions need to serve as 'guiding lights' without overly restricting the necessary degrees of freedom of the research process. In Mintzberg's (1979) words:

> *"No matter how small our sample or what our interest, we have always tried to go into organizations with a well-defined focus – to collect specific kinds of data systematically." (Mintzberg, 1979, p. 585)*

A contextually rich description of the biotechnology as well as the pharmaceutical industry, of the firms operating in them, and of their M&A activity is needed if a deeper understanding is to be gained. Thus, detailed descriptions or 'stories' are indispensable for eventually creating rich theoretical insights, even if this means that researchers have to collect seemingly

circumstantial technical information on the industries or companies they are observing in a time consuming effort. Piore (1979) points out that each information collected in the case study process can be considered as a certain piece of pattern of these cases.

Due to the fact, that this study does not only ask ‘what’ questions, but it also asks ‘why’ and ‘how’ questions, it can also be considered analytic in nature. The appropriate research methodology for a study that attempts to extend theory by description and analysis, that describes in detail ‘what’ M&A activity of the pharmaceutical companies in the biotechnology sector exists, that analyzes ‘why’ the observed integration patterns occur, and that analyzes ‘how’ the described behavior unfolds regarding both the forms and the sequences it takes on, is the comparative case study research methodology (Eisenhardt, 1989).

The choice for this research strategy is also supported by the work of Yin (1984), who distinguishes five research strategies: experiments, surveys, archival analyses, history, and case studies. From his point of view there are three basic conditions that determine the selection of an appropriate strategy for a study: (1) the types of research questions, (2) the extent of control an investigator has over actual behavioral events, and (3) the degree of focus on contemporary as opposed to historical events. This study asks ‘how’ and ‘why’ questions which are more explanatory in nature and thus – according to Yin (1984) – favor the use of case studies as the appropriate research strategy. Moreover, he also points out that the case study’s unique strength is its ability to deal with a full variety of evidence – documents, artifacts, interviews, and observations.

As in all exploratory studies of this kind, the case chapter is not only the longest chapter – it must also be considered as being the ‘heart and soul’ of the research. The goal is to develop a rich, complicated understanding of the integration of the biotechnology enterprises in the structure of the industry incumbents through the description and analyses of the different integration histories. Why the case study approach is chosen can best be expressed in the words of Stake (1995):

> *"We study a case study when it itself is of very special interest. We look for the detail of interaction with its contexts. Case study is the study of the particularity and complexity of a single case, coming to understand its activity within important circumstances." (Stake, 1995, p. xi)*

The study is directed at the integration process of small biotechnology companies in the structure of industry incumbents and the subsequent collaboration between them. The aim is to generate hypotheses and to extend theory in this field. Thus, the selection of an appropriate research methodology – such as the case study approach – is necessary. Of course, it is widely accepted that qualitative data are most appropriate for generating an initial understanding of the rationale or theory of a process. After that, the results can be tested by quantitative support (Eisenhardt, 1989). But, with a research focus that seeks to grasp the 'how' and 'why' of processes a story that narrates the sequence of events is absolutely needed (Van de Ven & Huber, 1990).

Yin (1984) mentions three major concerns a case study strategy has to deal with. *First*, there is the complaint about the lack of rigor of case study research. Thus, every investigator must work hard in order to ensure methodological rigor, which for example can be realized through the help of well-identified research questions as well as well-developed interview schedules and questionnaires (Eisenhardt, 1991). Taking this into account, the problems in case study research are not different from experiments, surveys or historical research. In this context, Yin (1984) mentions that "much depends on an investigator's own style of rigorous thinking, along with the sufficient presentation of evidence and careful consideration of alternative interpretation" (p. 105). *Second*, there is the frequently asked question of how to generalize from just one case. According to Yin (1984) the answer is that

> *"case studies, like experiments, are generalizable to theoretical propositions and not to populations or universes. In this sense, the case study, like the experiment, does not represent a 'sample', and the investigator's goal is to expand and generalize theories (analytic generalization) and not to enumerate frequencies (statistical generalization)". (Yin, 1984, p. 21).*

The *third* concern about case studies is that they take too long and result in massive, unreadable documents. This represents another challenge for the

investigator who has to look for alternative ways of getting information. He could for example make more use of the telephone or the data available in libraries instead of being a participant-observator. Moreover, he should keep in mind who the audience of the case study is going to be.

Eisenhardt (1989) emphasizes that "theory-building research is begun as close as possible to the ideal of no theory under consideration and no hypotheses to test" (p. 536). Because of this, the third chapter leads directly to the cases and the contextual descriptions of the industries of which the regarded companies are part. After a rich and theoretically unbiased understanding of the organizational integration activities has been gained, there will be the confrontation of theories and case results. This procedure of 'postponed' literature review will lead to the extension of theory and thus to a theoretical contribution of its own. Of course, even Eisenhardt (1989) must admit that "it is impossible to achieve this ideal of a clean theoretical slate" (p. 536). Thus, her advice is that the case study researcher "should avoid thinking about specific relationships between variables and theories as much as possible" (Eisenhardt, 1989, p. 536). And, that is exactly the approach this study is going to take.

Another crucial issue is to choose the right numbers of case studies. According to Eisenhardt (1991) it is important to notice that "the appropriate number of cases depends upon how much is known and how much new information is likely to be learned from incremental cases" (p. 622). Comparing this with her former statement, Eisenhardt (1989), this must somehow be seen in relative terms:

> *"A number of 4 to 10 usually works well. With fewer than 4 cases, it is often difficult to generate theory with much complexity, and its empirical grounding is likely to be unconvincing." (Eisenhardt, 1989, p. 545)*

Considering both statements, one may even draw the conclusion that every number of case study is right as long as new insights are gained. This study investigates the M&A and organizational integration activities of four pharmaceutical firms as well as their subsequent collaboration with the acquired company. The study is intentionally focused on this small number of enterprises in order to allow a detailed analysis and contextually rich description of the complex processes. Moreover, this study is limited to five cases because of the

given time and particularly the funding restraints. Having to choose between more cases and richer context this study tries to put its emphasis on a more contextualist research which, according to Pettigrew (1990), is more capable of capturing the embeddedness and temporal interconnections of corporate change processes. In this study, context refers to outer context, on the one hand, especially the development of the pharmaceutical and biotechnology industry, and to inner context, on the other hand, e.g. the organizational structure of a company.

Due to the limited number of five cases that can be included in this study, the selection of the firms is, hence, one of the most critical elements of the case study research process. As far as large-sample quantitative research is concerned random sampling is used to overcome the problem of bias. Following the advice of Pettigrew (1990) and Eisenhardt (1989) the investigator should choose cases such as extreme situations or polar types in which the process of interest is observable, because the goal of a case study research is to replicate or extend the existing theory.

This study selects two widely-known industries: the pharmaceutical industry as a well-developed industry, on the one hand, and the biotechnology industry as an emergent industry with lots of interconnections with the first one, on the other hand. Thus, we have large diversified corporations as well as small start-up companies which clearly represent the polar types recommended by Eisenhardt (1989). As a starting point this study has a look at the M&A activities within and between these industries. This procedure results in a 2x2 matrix (cf. Figure 4) determined by biotechnology/pharmaceutical companies as buyers on one axis and by biotechnology/pharmaceutical companies as targets on the other axis.

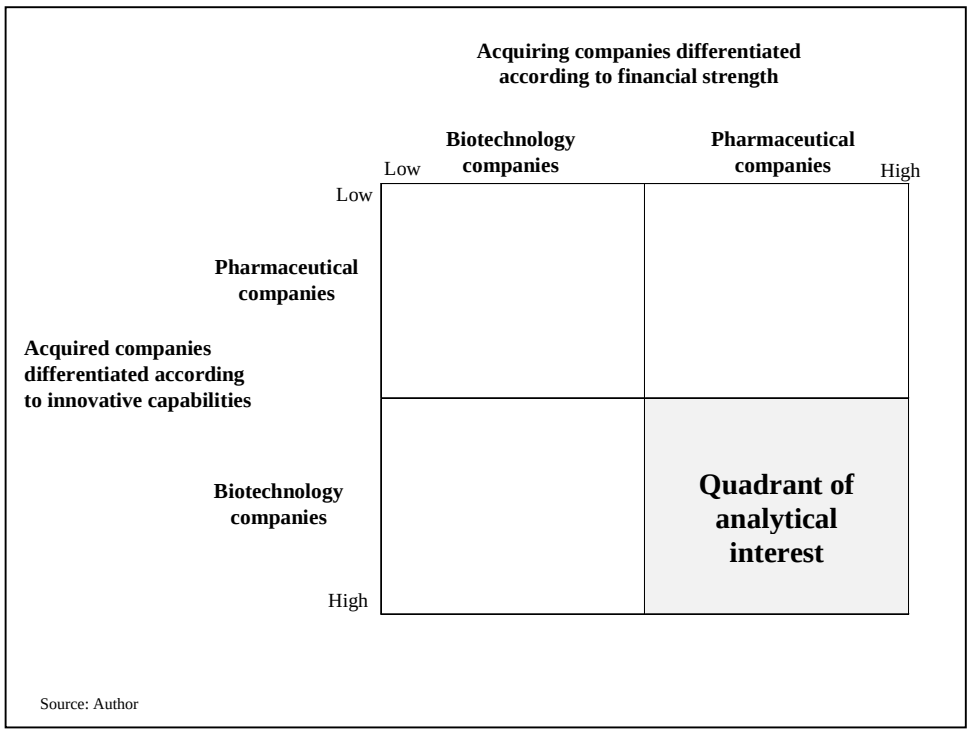

Figure 4: Classification matrix for M&A activities in the pharmaceutical and biotechnology industry

Now, the question arises which quadrant is of analytical interest. In order to determine this, the buyer-axis as well as the target-axis are each added by a second dimension. The buyers are differentiated according to their financial strength expressing, i.e. their capacity of being able to finance a takeover. It is not very surprising that pharmaceutical companies are ranked among those with great financial strength, whereas the biotechnology companies are rather 'poor' financial performers. On the target side, the additional dimension is the innovative capability concerning both research as well as organizational capabilities. Here, the pharmaceutical companies are considered as having rather low innovative capability, whereas the biotechnology companies are some kind of 'stars' in the field of innovation. Thus, the quadrant of analytical interest is the one where pharmaceutical companies being rich in cash acquire biotechnology companies having lots of innovative capabilities pharmaceutical companies do not have, however desperately would like to possess. This again reveals the polar types recommended by Eisenhardt (1989) and Pettigrew (1990). To generate a pool of potential sites for filling this quadrant a process of scanning documents had to be employed. Once a sufficiently large number of firms had been identified within this quadrant, a more detailed analysis of the kind of M&A and

integration activities was undertaken. Companies promising new, interesting insights have been approached with a request for cooperation for the study.

According to Eisenhardt (1989 & 1991) case studies can be regarded as a powerful mean in order to create theory, because they permit replication and extension among individual cases. The rich background context of cases is provided by stories (storytelling), but the deeper theoretical insights of case studies are gained from methodological rigor and multiple-case comparative logic.

As far as validity is concerned Yin (1984) points out four standard tests of validity: (1) construct validity by developing a correct set of operational measures, (2) internal validity by establishing a casual relationship, which Jick (1979) refers to as 'within-method triangulation', (3) external validity by establishing the domain to which a study's findings can be generalized, which Jick (1979) calls 'between-method triangulation', and (4) reliability by demonstrating that the operation of a study can be repeated. In the context of this study the concern of validity will be addressed in several ways. I.e., triangulation was used to increase construct validity. In this sense, triangulation was used not only to examine the same phenomenon from multiple perspectives, but also to enrich the understanding by allowing for new and deeper insights to emerge. The issue of internal validity was handled by conducting multiple iterations and follow-ups during the analyses. The problem of reliability and repeatability was addressed (1) by drawing up a detailed case study protocol and (2) by strictly following the required documentation and transcription standards. External validity was increased by studying multiple companies and analyzing comparative findings. This search for meaning within a case can be considered as a search for patterns or for consistency. If similar results are to be obtained from multiple cases, replication is said to have taken place. The multiple-case study contains multiple narratives which are presented as separate sections in Chapter 3 about each case.

In addition to that, this study also contains a section covering the cross-case analyses and results. Strauss (1987) describes this in three steps. *First*, the researcher will tend to construct for each case an overall descriptive picture, including both the inner and outer context. *Second*, each case is to be analyzed

separately. Within-case analysis typically involves detailed case study write-ups for each site. The central focus is to become intimately familiar with each case as a stand-alone entity, which allows the unique patterns of organizational integration and collaboration in each case to emerge before the investigator generalizes patterns across cases. To avoid being overwhelmed by the large amounts of information and data, the within-case analyses are focused around the already identified sub-research questions dealing with essential elements of M&A activities. *Third*, the case study researcher will draw general conclusions about all these cases. With the help of the cross-case analysis, the crucial part of multiple firm case studies, the investigator will capture the novel findings which may exist in the cases by looking at the data in many divergent ways. From the within-case analysis in connection with the cross-case analysis tentative hypotheses begin to emerge. Overall, the triangulating investigator is left to search for logical patterns in mixed-methods results. According to Eisenhardt (1989) it must be considered that "shaping hypotheses in theory building research involves measuring constructs and verifying relationships" (p. 543). After that, the comparison of the emergent hypotheses with the extant literature is an essential feature of theory building in case study research. By this, the internal validity, generalizability, and theoretical level of theory building from case study research will be enhanced. The theoretical saturation is reached when the incremental improvement through a new iteration process to theory is minimal. The issue of external validity, i.e., establishing the domain for generalizability, is a frequently overextended topic in the criticism of case studies. This case study does not claim to produce generalized theory, rather its aim is to produce hypotheses and theory extension for subsequent testing to then develop a general theory. However, this does not imply that external validity is not an issue to be addressed in case studies. This study uses multiple companies and comparative findings to increase external validity to the extent available. Furthermore, building on the experience of Harvard Business School case study researchers (Leonard-Barton, 1990), the issue of external validity will be taken into account by briefly discussing the post-merger integration activities of different companies, that can also be considered as some kind of 'mini-cases'.

2.2 Research design

This section will expose the particular research design of this empirical study by describing the choice of the research sites and the process of data collection.

The sampling of the case studies is crucial for later analysis, as the choice of the sample tends to influence the results of the study (Miles & Huberman, 1994). When analyzing a rather small sample of cases – as already depicted in the section before – 'extreme' research sites, also called 'polar types', are to be chosen (Pettigrew, 1990 & 1992). Based on these reflections, the following Table 1 provides an overview of major M&A deals between big pharmaceutical/health-care focused companies, of European origin, and U.S.-based biotechnology companies, which are to be analyzed in the context of this study.

Bidder	Target	Year	Value (US $ billion)
Pharmacia & Upjohn, Inc. (now: Pharmacia Corp.), Peapack, NJ, U.S.	SUGEN, Inc., San Francisco, CA, U.S.	1999	0.650
Bayer Diagnostics Corp., Tarrytown, NY, U.S./ Leverkusen, Germany	Chiron Diagnostics Corp., Walpole, MA, U.S.	1998	1.100
Merck KGaA, Darmstadt, Germany	Lexigen Pharmaceuticals Corp., Lexington, MA, U.S.	1998	Undisclosed
Sandoz AG (now: Novartis AG), Basel, Switzerland	SyStemix, Inc., Palo Alto, CA, U.S.	1991/ 1997	0.625
Sandoz AG (now: Novartis AG), Basel, Switzerland	Genetic Therapy, Inc., Gaithersburg, MD, U.S.	1995	0.283

Table 1: Sample of major M&A deals
(Source: Author)

The focus on U.S. biotechnology companies as targets can be explained by the fact that the American biotechnology industry is more advanced compared to the European biotechnology industry. This reveals also quite well why European pharmaceutical companies have mainly made their acquisitions in the U.S. and not within Europe. This view is also supported by the following quotation:

> *"[...] it is clear that Europe is slipping vis-à-vis the US. But why? The main reason is that pharmaceutical investments tend to go where the markets are. And for the past decade or more that has meant the US, where demand for medicines has been clipping along at double digits. [...] And yet, as with the pharmaceutical industry, European biotechnology is trailing the US." (Pilling, 2001, p. 8-9)*

Among a lot of other companies that had been contacted, the four companies mentioned in Table 1 have agreed to participate in the study. Apart from that, the facts that target and bidder are of the same origin and have the same differences in size enhance the comparability of the cases. Furthermore, this sample includes successful deals like Pharmacia – Sugen, but also analyzes failed deals such as the acquisition of SyStemix by Novartis. This corresponds to the 'polar types' recommended by Pettigrew (1990 & 1992). At a first glance, these 'polar types' might also be represented by the fact that the acquired biotechnology companies are of U.S. origin, whereas the acquiring pharmaceutical companies come from Europe. This might result in cultural problems. If this kind of problems existed, these potential cultural problems and differences would be quite similar for all acquiring companies. However, the case studies revealed that country cultural differences played no role in this specific context. Because of this, the analytical focus of this study is not put on potential problems that might arise due to the fact that the acquiring companies are of European origin, whereas the acquired biotechnology companies are of U.S. origin. Moreover, there is a clear tendency that pharmaceutical and biotechnology companies have broadened their search for good science, great scientist, new opportunities for expansion and funding far beyond their own borders. They have formed international start-ups, composed of managers and researchers residing on two different continents, or even have reached across the ocean to acquire companies whose technology and skills are not only complementary, but will allow them to achieve a critical mass going forward. Thus, the geographic boundaries have more or less completely disappeared. This point of view is corroborated by the following quotation:

> *"It's a global trend caused by the opening up of the capital markets paired with greater competition in the pharmaceutical industry [which is also establishing new footholds around the world]. Companies, whatever their nationality, are quickly looking beyond their own geographic boundaries – for good science, for*

> *funding, for partners, for growth through acquisition, and for expansion into new markets. The borders have become all but invisible." (Van Brunt, 2000, p. 9)*

Hence, both industries, the pharmaceutical and the biotechnology industry, can be considered as being global industries existing across almost all borders.[4] Because of this – in the context of this study – internationalization is not to consider as a separate phenomenon when analyzing the post-acquisition integration activities between pharmaceutical and biotechnology companies. Instead, internationalization is rather an inherent part of these two industries. As a consequence of this, theories or studies that treat international aspects are not summarized under a heading such as 'contribution of internationalization theories and studies', but will be included when discussing the respective aspects of the post-acquisition integration issues.

Given the qualitative nature of most of the data sought, triangulation was one of the most important means of increasing construct validity and substantiating findings and subsequent hypotheses (Denzin, 1978). The archival documents used are presented at the beginning of each case write-up and are also included in the case study database. The most common documents used were: SEC filings (forms 10-K and 10-Q), annual reports according to German law, 'red herring' prospectuses pursuant to Part Ia of the 1933 act registration statements, articles from the business and trade press, internal documents such as presentation slides, catalogs, executive speeches, and company press releases available through the web-sites of the case study companies, their subsidiaries, partners, and competitors. Apart from that, analysts' reports of different investment banks were used as well. The advantages of the documented sources include their tendency to be more comprehensive and less subjective to memory based bias. The amount of

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[4] The theoretical discussion about the concept of a global strategy has already started with Perlmutter's (1969) categorization scheme the starting point of which was the worldview of a firm as the driving force behind the way it structured its world-wide activities (Robinson, 1978; Rutenberg, 1982). Different studies about the topic of global strategy (Levitt, 1983; Hout, Porter, & Rudden, 1982; Hamel & Prahalad, 1985; Kogut, 1985) reveal that there is a great deal of conceptual ambiguity about what a 'global strategy' really means. Thus, Ghoshal (1987) has developed a framework in order review and analyze a firm's strategies.

relevant documents differed by firm. All documents collected are included in the case study database.

While the preliminary interviews and conversations were unstructured, the interviews with the company representatives employed a semi-structured design in order to allow for an appropriate degree of comparability and, at the same time, to allow for ample opportunity for an unobstructed flow of narrations.[5]

Interviews were conducted 'face-to-face' (with one exception via telephone) in German or English and usually lasted 1.5 to 2.5 hours, the longest exceeding 3 hours. The interviews were taped and fully transcribed.[6] This procedure of full transcription is imperative for reasons of internal validity and reliability. In their authoritative work on the methods of data collection Bortz and Döring (1995) state: "If an interview also contains open questions and narrative parts, an audio recording is unavoidable" (p. 230).[7] All transcripts are included as part of the case study database. Similar to the well-established Harvard Business School case research approach, all interviewees were granted anonymity, so that nothing they said was attributed to them personally until and unless they approved of the transcript (Leonard-Barton, 1990).[8] In order to increase the overall quality of the study, the draft case reports have been reviewed by the participants and informants in the case. Furthermore, from a methodological viewpoint, these corrections enhance the accuracy of the study, hence increasing the construct validity of the study (Yin, 1984).

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5 The questionnaire is included in the case study database.

6 Citations from interviews conducted in German were translated into English.

7 In addition to the added rigor and internal validity, one of the main benefits of taping and transcribing interviews is that the interviewer can concentrate on what is being said, rather than being continuously distracted by note-taking.

8 Interviewees received copies of the case description with requests for approval. If they objected to certain parts of the case descriptions they were asked to mark the parts which were then omitted from the final version. Interviewees were also asked to make additions or clarifications which were then integrated into the final case descriptions. In one case study the interviewees insisted on the fact that no quotation of their statements may be used.

Often, case studies confront the investigator with a choice regarding the anonymity of the case. Should the case study and its informants be accurately identified, or should the names and the entire case be disguised? The most desirable option is to disclose the identities of both the case and the individuals. By this, the reader is able to recall any other previous information he or she may have already learned about the same case in reading and interpreting the case report. Nevertheless, there are some occasions when anonymity is absolutely necessary. The most common rationale is that, when the case study has been on a controversial topic or involves big failures linked with the loss of money, anonymity serves as a measure to protect the real case and its participants. On such occasions when anonymity may appear justifiable – as it is in the cases studied – a compromise should be first sought (Yin, 1984). In such a situation, the investigator should determine whether the anonymity of the individuals alone might be sufficient, thereby leaving the case itself to be identified accurately. This compromise was also necessary and, hence, was used in some of the cases analyzed in this study.

While the objective of the data collection phase was to create an accurate portrayal of the 'what' question concerning the integration processes of the different deals, the objective of the data analysis was to enable the generation of hypotheses concerning the 'how' and 'why' questions. However, as recommended by Pettigrew (1990), the data collection and data analysis phases were overlapped chronologically in order to allow for follow-up data collection. The entire process of data collection and analysis lasted from January 2000 to March 2001. The analysis phase consists of two parts: within-case analysis and cross-case analysis. Building on the detailed case descriptions, the within-case analyses aim at identifying patterns in the integration process of each firm. In order to avoid being overwhelmed by the large amounts of information, the within-case analyses are focused around the same specified categories that serve as essential elements of organizational integration activities. The crucial part of multiple firm case studies is the cross-case analysis. Eisenhardt (1989) points out that: "Across-case searching tactics enhance the probability that the investigators will capture the novel findings which may exist in the data" (p. 541). Furthermore, the cross-case analysis builds on the results of the within-case analyses by focusing on the same categories.

The organizational integration patterns that gradually emerged from within and cross-cases analyses were iteratively (re-)confronted with the cases in order to assess their fit with the observations. If necessary, some of the emerging patterns were either dropped or refined and adjusted until their fit with the data appeared close enough to base some tentative hypotheses on them. This process of field work and data analysis reached closure when additional iterations did not result in a better accord between the tentative hypotheses and the cases, i.e., when theoretical saturation was achieved and marginal improvements became minimal.

The final step in the research process for this study began concurrently with the cross-case analyses and can be best described as ‘enfolding the literature’. An essential feature of hypothesis formation and theory extension from tentative hypotheses lies in the comparison of the emerging hypotheses with extant literature (Eisenhardt, 1989). Chapter 4 of this study is devoted to such an extensive juxtaposition of the case-based findings of Chapter 3 with both conflicting and similar findings in the literature. This procedure of ‘postponed’ literature review will lead to the extension of theory and thus to a theoretical contribution of its own (Chapter 5).

The research outline of this study is again summed up in the following Figure 5:

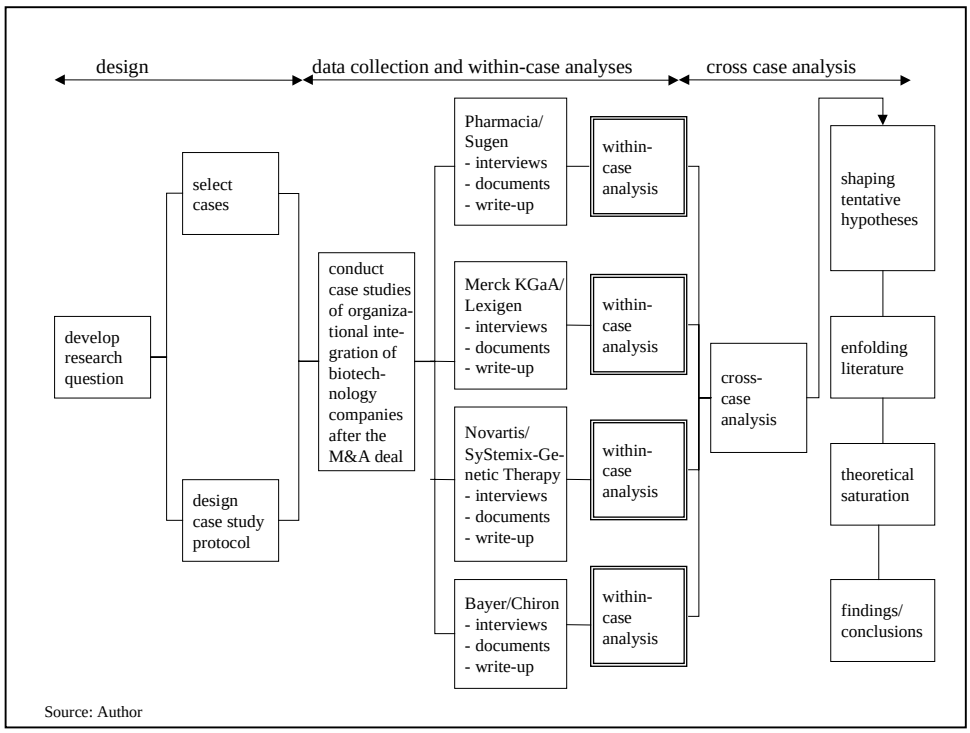

Figure 5: Research outline of the study about post-acquisition integration activities

On the basis of the methodology discussed in this chapter, the following Chapter 3 will present the empirical case studies, starting with building the respective industry context.

3 Case studies of organizational integration of biotechnology companies after the M&A deal

> *"To find the balance, acquiring companies must decide where they can allow the new acquisition to continue as it has in the past, and where the acquisition will have to adopt to the new order." (Copeland, 2001, p. 94)*

The aim of this chapter has already been referred to in the introduction. At the heart of this chapter stand several case studies of integration activities between big pharmaceutical and small biotechnology companies. The goal is to develop a rich understanding of the organizational integration process of these enterprises through the descriptions and analyses of five firm-level integration histories. This will be done by gaining insights into the motives, forms, and processes of organizational integration activities of four big pharmaceutical enterprises that are active in the biotechnology industry by selecting a firm-level perspective.

In a first step, the development of the pharmaceutical and biotechnology industry will be presented in order to provide the appropriate setting for the different case studies. The analysis and description of the industry development and the M&A activities in these industries are to serve as a useful background for the rich understanding of the cases, but are also to make clear why the cases are worthwhile analyzing.

Each case starts with a short corporate profile of the companies involved and is subsequently divided in two major parts. The first major part is the case description which contains a detailed depiction or story about the integration process and collaboration between the considered companies. The second major part is the subsequent within-case analysis section which – in contrast to the almost pure descriptive section of the first part – is much more analytical in nature and tries to analyze the given data, which can be considered as being one of the most crucial steps in building theory from case studies. The necessary prerequisite for the within-case analysis is the detailed case study description as will be done at the beginning of each case study section, which is central to the generation of insights, because it allows the researcher to cope early in the analysis process with the enormous volume of data. As already outlined in the methodology section in Chapter 2, the overall idea is to become familiar with

each case as a separate, stand-alone entity (Eisenhardt, 1989). The following step deals with the analysis of the specific case in order to allow unique patterns of each case to emerge and to be explained before the cross-case analysis is performed. A separation of case description and within-case analysis is absolutely necessary, because of the huge amount of data and information involved. Besides this overwhelming amount of data a combined descriptive and analytical section would also make disappear the border between the pure description of the facts and the respective analysis. Thus, the reader would no longer be able to distinguish between what has been described based on the interviews as well as documents, on the one hand, and what has been the analytical contribution and conclusions of the author, on the other hand. Because of these two reasons, a division becomes quite inevitable.

The framework selected for the within-case analysis is based on the semi-structured questionnaire used for the interviews. The topics chosen for the questionnaire have been developed by making a first review of the post-merger/post-acquisition and M&A literature and studies as well as preliminary discussions with industry experts and has also been continuously up-dated based on useful remarks which came up during the different interviews. To start with, there is the question about the motives and, by this, also the strategic rationale behind the acquisition and the subsequent integration and collaboration. After that, there is the analysis of the integration process, which can be subdivided in two major perspectives. On the one hand, it is necessary to analyze the integration topics of organizational/structural integration, knowledge/competence integration and transfer, cultural integration as well as people integration. The central subject in this context is the aspect of organizational integration, because all the other issues are in some way centered around this. On the other hand, there is a clear need to analyze the organization of the integration process itself which only allows, supports and enables the different integration issues to be realized.

3.1 Building industry context

This section will analyze the development of the pharmaceutical and the biotechnology industry with the aim of (1) depicting the peculiarities of both industries that need to be considered in the post-acquisition integration process as well as (2) revealing that both sectors have a huge potential for M&A activities. The final section will provide some empirical evidences for M&A activities in the pharmaceutical and biotechnology industry that have occurred during the last years.

3.1.1 The pharmaceutical industry

> *"The early 1990s were a watershed in the evolution of the pharmaceutical industry. After years of relatively stable growth, high profits, and an enviable record of innovation, pharmaceutical firms found themselves struggling against a tide of hostile forces." (Pisano, 1997a, p. 51)*

When Felix Hoffman produced Aspirin, he turned Bayer, the dye-maker for which he worked, into the world's first drug company. The birth of the pharmaceutical industry epitomizes its subsequent development. Over the past hundred years, it has successively adapted to advances in medicine, biology, epidemiology, economics and information technology. This ability to evolve in response to new sources of scientific knowledge has served it well. However, this evolution is rather a process of slow change and the industry now faces a challenge of absolutely unprecedented scale. During the next several years – as already indicated in the above quotation – there will be a continuous transformation process in the pharmaceutical industry. Competition in the pharmaceutical industry has historically been characterized by three factors. *First*, competitive advantage has been driven by blockbuster drugs, which were required to offset the cost of expensive hit-or-miss clinical trial programs. *Second*, all pharmaceutical companies have traditionally been vertically integrated from discovery through sales. *Third*, pharmaceutical companies have played a peripheral role as 'suppliers' in the health care system, provided marketing solutions to payers and providers, but had no intention in driving primary consumer demand or becoming involved in care, diagnosis, or decision-

making. Thus, in this environment success was based on a combination of serendipity and operational capabilities (BCG, 1999).[9]

Nowadays, pharmaceutical companies face daunting stock market expectations and short-term operating pressures on earnings. Basically, they have to choose between two alternative strategies: either they turn to mergers and acquisitions in order to plug strategic holes and accelerate operational improvements, or they remain independent and put a concerted focus on near-term performance-improvement. Whether merging or not, pharmaceutical companies have to face lots of revolutionary changes on the horizon. The challenge is to weather short-term pressures, while at the same time rethinking fundamental questions of business strategy in the light of revolutionary changes ahead.

But what are these revolutionary changes the pharmaceutical industry has to deal with? The challenges for the pharmaceutical companies arise from the consequences of two basic developments: the change in prolific discovery and the possibility to manufacture tailored products. First of all, we will have a closer look at these basic developments before considering their repercussions on the pharmaceutical industry itself in the light of the stock market expectations and the short-term operating pressures on earnings pharmaceutical companies face.

(1) New challenges for the pharmaceutical industry

The fundamental task facing the pharmaceutical industry has been relatively constant: identify targets for drug intervention, create novel compounds, and screen the two against each other in order to find compounds that might be effective drugs. So far, nothing is easier than that. However, the technologies and the knowledge underlying these functions are changing dramatically, altering the fundamental nature of discovery (PricewaterhouseCoopers, 1998a & 1999e). Traditionally, the discovery of new chemical entities (NCEs) has been a rare,

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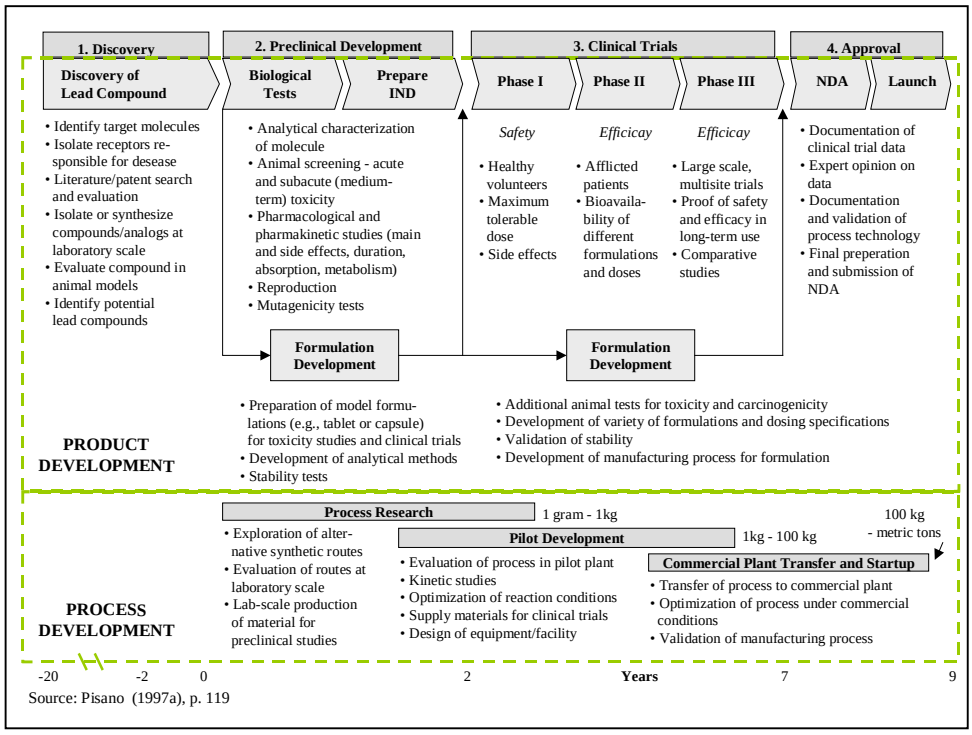
[9] The following characterization of the pharmaceutical industry is partly based on a BCG report (BCG, 1999). But, the argumentation is quite different. Whereas BCG treats the two basic developments in the pharmaceutical industry – the change in prolific discovery and the possibility to manufacture tailored products – only in the Appendix, this study considers these developments as the fundamental basis of discussion. Hence, this study starts with these revolutionary changes, stressing the crucial impact biotechnology has on the pharmaceutical industry by altering the fundamental bases of competition.

expensive and serendipitous event, and has long been the principal bottleneck in the pharmaceutical value chain. Apart from that, pharmaceutical companies are organized to meet their present objectives, the development and sale of drugs. Their structure often reflects the different stages of a drug's development and the technical expertise of the personnel involved. This is shown in the most important parts of the pharmaceutical value chain – the research and development steps – as Figure 6 reveals.



Source: Pisano (1997a), p. 119

Figure 6: Research and development process of a new drug

Explosive developments in the areas of genomics, combinatorial chemistry and high-throughput-screening are fundamentally altering the science and economics of drug discovery (BCG, 2001b & 2001c). This is one of the most important impacts of biotechnology on the traditional pharmaceutical industry. The strategic implications of the new discovery technologies are that:

- the NCE bottleneck disappears,
- there will be a trade off between the quantity of hits against the quality,
- the new economics of discovery change requirements of scale,
- finding alternatives to animal studies will be the next bottleneck, and
- a cultural change towards a more effective selection of drug candidates from a larger portfolio will be indispensable.

Hence, success will require pharmaceutical firms to develop new capabilities on many fronts. First, they have to dedicate resources in order to stay informed of technology developments and integrate the most promising technologies in-house. Second, the efficient storage and effective retrieval of the vast quantities of data provided by the new technologies have to be assured. Third, companies will have to hire the right talent for each specific task and pay attention that they effectively work together. Fourth, development and marketing must continuously be informed over the advances in discovery, because they have to create targeted products for smaller subpopulations of diseases. Fifth, pharmaceutical companies will have to create effective tools for portfolio selection and management. Thus, new discovery technologies are leading the way to a world where pharma pipelines are not constrained by a limited number of promising compounds, and the former random screening approach for new compounds will be replaced by a more focused, science-guided screening approach.

Across the pharma industry, traditional boundaries are disappearing. The traditional pharma business has been driven by mass-marketed products that were not differentiated across consumers. With the help of pharmacogenomics it will be possible to tailor drugs to a particular subpopulation of patients (BCG, 2001b). Thus, the traditional mass-market paradigm is challenged because this tailoring will shrink market sizes, create opportunities for higher prices, and, over time, change the cost and the success rates of clinical trials. In the old days, drugs were marketed to the entire patient population. This implied some drawbacks for pharma companies as well as consumers, payers, and providers. E.g., pipeline productivity suffered, because, if a drug proved toxic or was effective in 50 percent or less during clinical trials, the project was terminated, although the compound might have been viable for a particular patient subsegment. Furthermore, mass-market development reduced the potential efficacy rates. Products that did reach the market often experienced only 50 percent to 80 percent average efficacy. Moreover, many drugs were approved with known side effects for a small, but undefined percentage of approved users. Apart from that, the early termination of pipeline products meant for groups of patients who might have responded well to this particular new medicine the deny of access.

Now, the pharmacogenomics revolution leads to an increase in the number of targets for pharmaceutical intervention (PricewaterhouseCoopers, 1998b). Of

course, pharmacogenomics is still in its infancy, and most experts estimate that it will take at least another ten years before there is enough genetic knowledge to begin tailoring treatments for most diseases. But, from then on, pharmacogenomics will drive the replacement of blockbusters with a new portfolio approach. This approach is characterized by a potential for premium pricing, the creation of blockbuster suites, an improved pipeline productivity, and lower-cost clinical programs. By this, the former hit-or-miss clinical trial programs are replaced by tailored products for a specific patient subsegment. Consequently, the costs of clinical trials decrease, whereas its speed and efficacy rate increase (BCG, 2001c). Although its timing is unpredictable – science is always proceeding at an unknown pace – the direction of changes described is virtually certain. To succeed in an environment of tailored products, pharmaceutical companies will have to establish a systematic linkage with diagnostics, targeted marketing to payers, providers, and consumers, and regulatory management. The emergence of tailored products as a consequence out of the new discovery technologies will lead to a promise of revenue opportunities as well as a threat of new competition.

(2) Strategic options for pharmaceutical companies

Besides these two fundamental developments described in the section above, the pharmaceutical industry faces daunting stock market expectations and short-term operating pressures on earnings. Hence, it is necessary to consider short-term as well as long-term requirements in operational and strategic decision-making of the individual company. This means that this study shifts now from the industry perspective to the company perspective.

While the financial community is calling for strong earnings growth, there are three existing threats to that growth. *One*, over the next few years, the pharmaceutical industry faces an unprecedented level of patent expiration. *Two*, increasing demands for cost containment are preventing pharmaceutical firms from taking price increases above the rate of inflation. *Three*, the late-stage development pipeline is insufficient to overcome these factors.[10] Figure 7 tries to

[10] A broader survey among top managers identifying the key issues facing the pharmaceutical and health care products industry was carried out by PricewaterhouseCoopers (1999d).

depict the huge amount of money and the risk pharmaceutical companies have to bear in order to bring a drug to market.

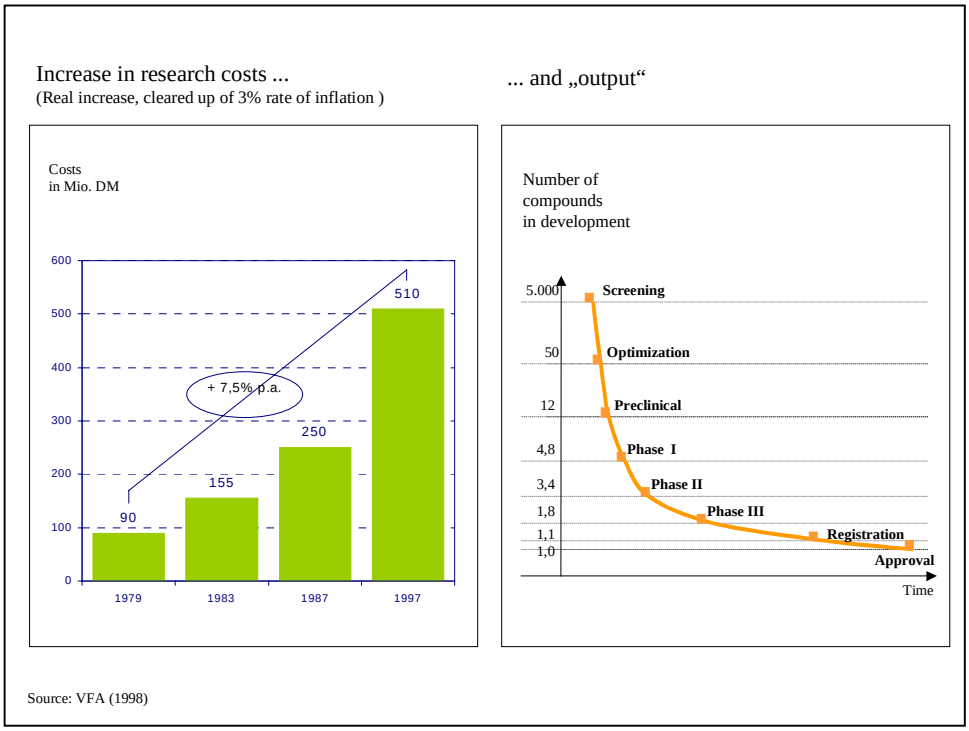


Figure 7: Development of research costs in the pharmaceutical industry

Basically, there are two broad strategies for filling this earnings gap. For some companies, a merger is the best answer to both short-term pressure and long-term pipeline gaps. For other companies a multipronged operational improvement aiming at achieving best-in-class performance will be a viable solution for filling the gap (BCG, 1999). In order to close the earnings gap organically and remain independent, companies can rely on three pillars:

(1) To make the most of each product, they are to put their attention on simultaneous global launches, enhanced market penetration, and improved life-cycle management.
(2) More and swifter new-product launches can be realized by cycle-time reduction due to structured resource allocation, better data management, improved trial methodologies, better filing approaches, and an increased understanding of regulatory requirements as well as by in-licensing.
(3) A more efficient asset utilization is possible through an improved inventory management and a better asset turnover.

Nevertheless, achieving these operational changes requires only reaching the boundaries of the existing industry paradigm. This can only be regarded as a prerequisite for the realization of the next wave of opportunities: the challenge of biotechnology. Analyzing the M&A activities in the pharmaceutical industry may also contribute to gain insights in how operational improvements can be realized. However, this would mean that this analysis is staying in the existing industry paradigm. As the focus of this study is on the impact of biotechnology, leading to a new industry paradigm, this study will not analyze M&A activities in the pharmaceutical industry itself as a mean to achieve operational improvements or scale effects although it seems that this is a widely proliferated strategy as Figure 8 shows.[11]

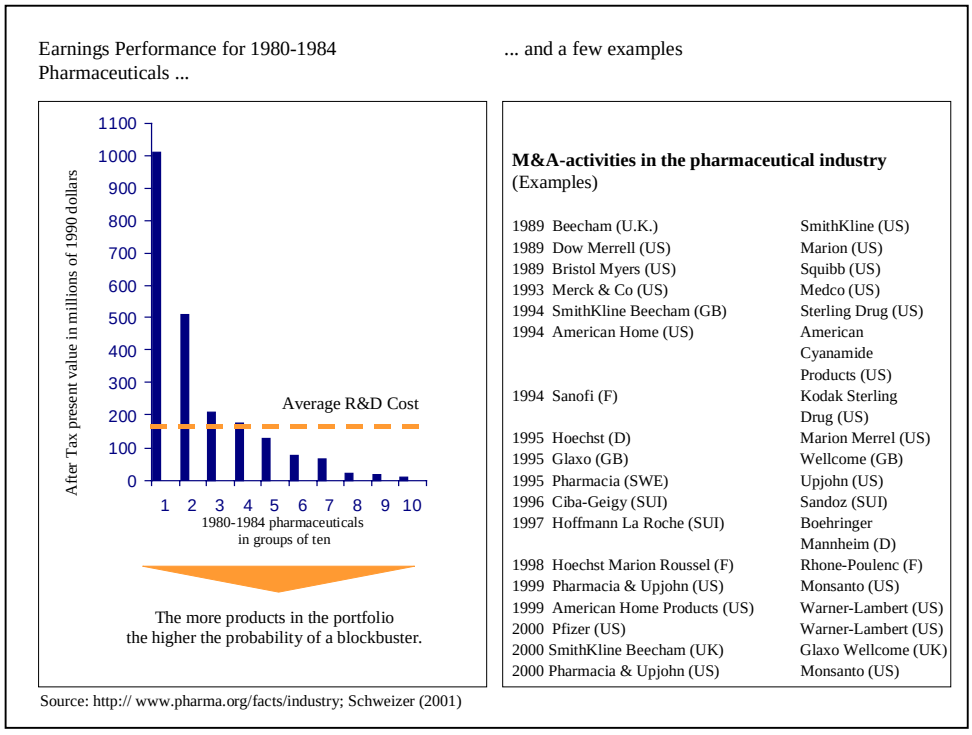


Figure 8: Earnings pressure and M&A activities in the pharmaceutical industry

From a competitive perspective, biotechnology challenges the historical bases of competition (blockbuster drugs, vertical integration, role as supplier) in the pharmaceutical industry. Basically, there are three factors to take into consideration. *First of all*, innovations in combinatorial chemistry, high-throughput screening, and genomics are not only changing the output of

11 A more detailed analysis can be found in Schweizer (2001).

discovery, they are also opening up new defensible patent spaces. Thus, pharmaceutical companies have to protect more systematically the discovery of innovative lead compounds and have also to stake claims to new classes of drugs by patenting targets, methods of actions, and pathways. In the traditional discovery paradigm, identifying new compounds was slow and expensive, and innovative launches tended to be followed by 'me-toos'. Because the patenting focused on compounds and the available tools were used broadly by all competitors, patents based on these tools could not be effectively established. Now, the increasing knowledge creates spaces for broader intellectual property. There will be larger patent spaces around molecules and new types of patent spaces such as high-value knowledge about genes, disease pathways, and drug targets. Of course, the proposition of defensible innovation rests on the assumption that legal authorities will uphold broader patenting. Moreover, the ability to write broader patents forces companies to think much earlier about the role of patenting in their product development strategy. The strategic implication to bear in mind is that patenting needs to shift from a supporting role to a strategic function in order to create well-defined isolating mechanisms. The new capabilities required to support innovation are a more strategic approach in defining and protecting intellectual property, a larger intellectual property department with more experienced staff, a broader understanding of the global and regulatory environment, as well as the ability to assess the value of competitive patents.

Second, knowledge and technology are not only transforming drug discovery, they are also redefining the business structure of the pharmaceutical industry. Many new players focus on narrow elements of the pharmaceutical business, from clinical trials to specialty manufacturing to genomic databases and screening capability. Due to the evolving expertise of these focused companies and an increased communication linkage between them, one company can identify a new compound, another may match it to a target, a third could carry it through clinical development, a fourth might launch it, and still another company can bear the financial risk of bringing the drug to market. This trend is called deconstruction of value chain (Heuskel, 1999; Hamel, 2000; Amit & Zott, 2001). According to BCG (1999) there are two main business models available to

pharmaceutical companies in an environment changing like that.[12] Orchestrators, integrated companies, must rethink the value of external connections. This means, at each step of the value chain, they need to assess the tradeoffs between improving internal skills and accessing superior external capabilities. Focusers, which mainly will be biotechnology companies, can be distinguished in service providers, such as contract manufacturing organizations (CMOs) and contract research organizations (CROs), and technology players. As far as orchestrators are concerned the question is: To what degree do major pharmaceutical companies want to build skills in suppliers that can offer those same skills to competitors? The key question regarding technology players is: Can pharmaceutical companies come up with strategies to bypass or otherwise neutralize the power of these specialists? In order to be an effective orchestrator in a networked world it is necessary to access technology, maximize the effectiveness of executive functions and balance insourcing versus outsourcing. Outsourcing can hence be used to free up resources for higher-value activities. To succeed and to survive orchestrators have to adopt a new mindset, assess internal capabilities critically, view functions as modular units, engage in sophisticated dealmaking, and hire and retain the right talents. As the pharmaceutical business model evolves and external providers (focusers) develop superior skills and knowledge, the integrated company is being transformed through a complex web of partnerships and supplier relationships (orchestrators), reshaping the industry structure.

Third, for the first time in history, the person with the greatest influence over the sale of a drug may soon be the person who takes it. Basically, there are two forces that are initiating a consumer revolution in health care, moving consumers from a peripheral to a central role (BCG, 2001a; PricewaterhouseCoopers, 1999c). First, consumers are gaining access to information and establishing greater control over decisions about their care. Second, accelerating progress in genetic understanding creates the possibility for the first time to segment patients on the basis of

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[12] A more detailed discussion about the construct of business models especially in the pharmaceutical and biotechnology industry can be found in Meinhardt & Schweizer (2001). A theoretical approach to the construct of business models can be found in zu Knyphausen-Aufseß & Meinhardt (2001).

genomic descriptors and tailor therapy according to their specific needs. Traditionally, health care focused on diseases, not individuals. In the old paradigm, consumers' experience with pharmaceuticals was radically different from their experience with other industries that supply products for their use. Nowadays, leveraging advances in technology and encouraged by payers, providers and manufacturers, consumers are claiming a more active role in decisions about their care. This is made possible by the access to information and by an increasing availability of genomic knowledge. From a strategic point of view, pharmaceutical companies must begin to recognize the increasing power of consumers in shaping care (Harms et al., 2001). To become consumer-centric companies must develop strategic and sophisticated marketing programs, establish a deep understanding of consumers' need, and move beyond targeted marketing and integrate consumer understanding into the entire pharmaceutical value chain. The consumer-centric paradigm will evolve at different speeds in different markets, and may not work for all diseases.

The main points which characterize the development in the pharmaceutical industry are again summed-up in Figure 9:

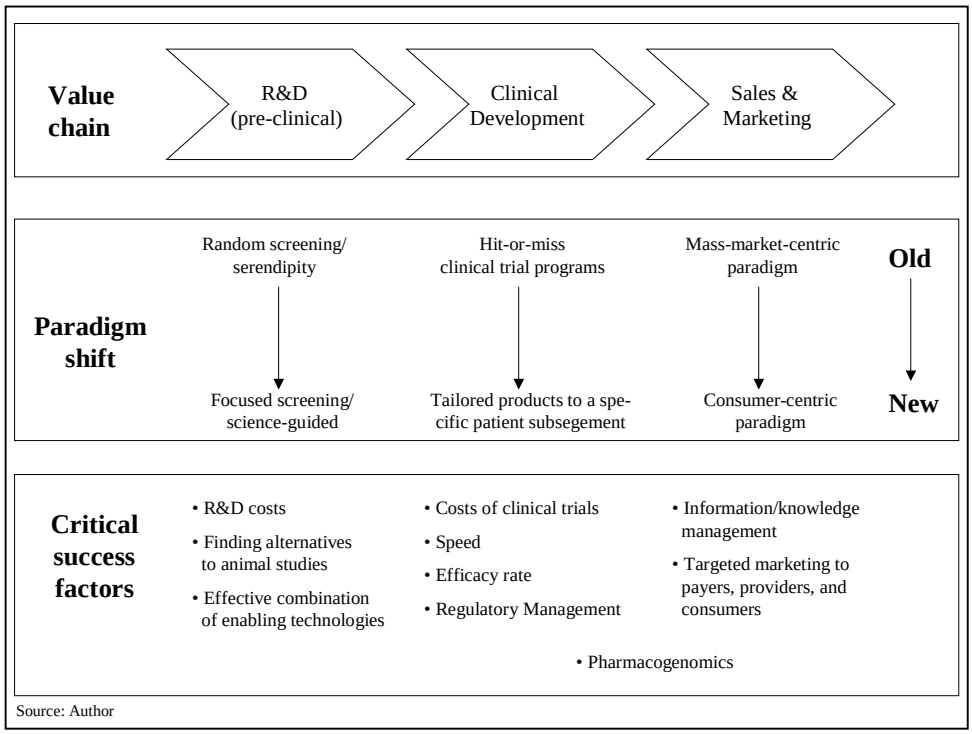

Figure 9: Transformation process in the pharmaceutical industry

(3) Concluding remarks

Because of this transformation process the leaders of today's pharmaceutical companies face a demanding but nevertheless exhilarating challenge. They have to steer their companies through the near-term earnings gap, pursue an industry-wide approach to shaping the health care environment, address the fundamental choices of where to compete and how to compete, and foster the build-up of new capabilities such as patenting, licensing, strategic human resource management, internal and external information management, marketing, and partnering. This study focuses on the fundamental choice of how to compete. This implies that companies must adopt a new way of looking at integration and coordination, assessing the value created in each function, determining what skills are available through partnerships with service providers or technology players, and building an organization capable of coordinating across boundaries (PricewaterhouseCoopers, 1999b). Besides the need to establish a strong financial base that will fund continuing investment in new markets, technologies, and customer needs, the acquisition of knowledge in the biotechnology sector and its understanding are crucial for their future survival.

Basically, there are three different strategies: first, organic growth, which means that pharmaceutical companies have to build up this knowledge on their own, second, any kind of partnership such as strategic alliances or R&D agreements with biotechnology firms or universities, through which the company can gain access to the required knowledge, and, third, M&A in order to integrate companies which possess the necessary knowledge and capabilities. Thus, M&A is not only a method to close near-term earnings gap and improve operational performance, it is, first and foremost, a strategic possibility to overcome a lack of knowledge in the biotechnology sector or catching-up as a late entrant. It is this last point on which this study puts its focus: the acquisition of biotechnology firms by large pharmaceutical companies in order to add internal knowledge and contribute to the short as well as long-term objectives of the firm by internalizing a whole body of laboratory and product development capabilities. Thus – from the point of view of this study – the aspect of organizational integration and the

respective collaboration in the context of the post-merger integration process is the most crucial issue pharmaceutical companies have to cope with.

3.1.2 The biotechnology industry

> *"The commercial potential of biotechnology appealed to many scientists and entrepreneurs even at its embryonic stage. In the early years, the principal efforts were directed at making existing proteins in new ways, then the field evolved to use the new methods to make new proteins, and now today the race is on to design entirely new medicines. The firms that translated the science into feasible technologies and new medical products faced a host of challenges." (Powell, 1998, p. 232)*

This chapter tries to describe the development of the biotechnology industry from different perspectives: from a technological/scientific perspective, from an organizational/management perspective, and from a financial perspective. But first of all, it has to be made clear what is meant by the term 'biotechnology'. Biotechnology has been defined in many different ways, but none of the numerous definitions has been universally accepted. The OTA (Office of Technology Assessment) definition, focusing on third generation biotechnology, has, however, been widely accepted by international organizations and scholars.[13] In its special report on the biotechnology industry the OTA states:

> *"To differentiate between biotechnology using more traditional techniques from the newer techniques developed in recent years, OTA uses a second more narrow definition of biotechnology. This definition refers only to the 'new' biotechnology: the industrial use of recombinant DNA, cell fusion, and novel bioprocessing techniques." (OTA, 1998, p. 29)*

Biotechnology thus encompasses the use of skills drawn from biology, biochemistry, genetics, microbiology, biochemical engineering, combinatorial chemistry, and separations processing. This definition above puts the emphasis on three elements: recombinant DNA, cell fusion, and bioprocessing techniques. All

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[13] E.g., the OECD (1989) defines biotechnology as "the application of scientific and engineering principles to the processing of materials by biological agents" (p. 21). Furthermore, Weisenfeld-Schenk (1995) demonstrates in her survey of definitions for third generation biotechnology that there is considerable convergence around the OTA definition.

these elements will be explained in greater detail along the discussion of the scientific foundations of modern biotechnology in the following section.

(1) The development of the biotechnology industry from a scientific point of view

Broadly considered, biotechnology includes techniques as old as Western civilization itself: e.g., the cultivation of micro-organisms for brewing and the intentional cross-breeding of plants and animals. Thus, the roots of modern biotechnology, the so-called 'first generation of biotechnology', lie in the fermentation of foods and drinks, industries spanning almost every society and evolved over centuries (Sharp, 1991; Kenney, 1986). In other words, biotechnology has been used as long as people have baked bread and drank wine. 'Second generation biotechnology' developed as an outgrowth of traditional fermentation in the late nineteenth and early twentieth century, and depicted the greater understanding about micro-organisms. The discovery of penicillin by the British bacteriologist Alexander Fleming in 1928, and the subsequent development of the antibiotic industry, has been one of the major milestones of the twentieth century – as already indicated in Figure 2. 'Third-generation biotechnology', also called 'new' or 'modern' biotechnology, on which this study puts its focus on, results from the discovery in the early 1970s of the method by which genes could be cut and spliced. It includes the use of recombinant DNA and cell fusion techniques as well as bioprocessing technology, to make or modify products.[14] The development of the three biotechnology generations – as it is shown by Sharp (1991) – is summarized in Figure 10.

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[14] Before describing the development of the biotechnology industry from its different perspectives in more detail, it is necessary to emphasize the distinction between the pharmaceutical and biotechnology industry – considered from the point of view of this study. On the one hand, the pharmaceutical industry can – in simplified terms – be subdivided in a non-biotechnology (rather chemical) part, which is losing more and more of its former importance, and in a biotechnology part, which, obviously, is becoming the most important one. On the other hand, the biotechnology industry can be segmented into (1) red biotechnology dealing with human health care, (2) green biotechnology focusing on agriculture, (3) gray biotechnology dealing with environmentally friendly methods, and (4) biotechnological equipment/devices. The most interesting segment to analyze is the overlap between the increasing biotechnology part of the pharmaceutical industry and red biotechnology which also includes the diagnostics business as this covers red biotechnology as well as biotechnological equipment and is a very important part of the health care business.

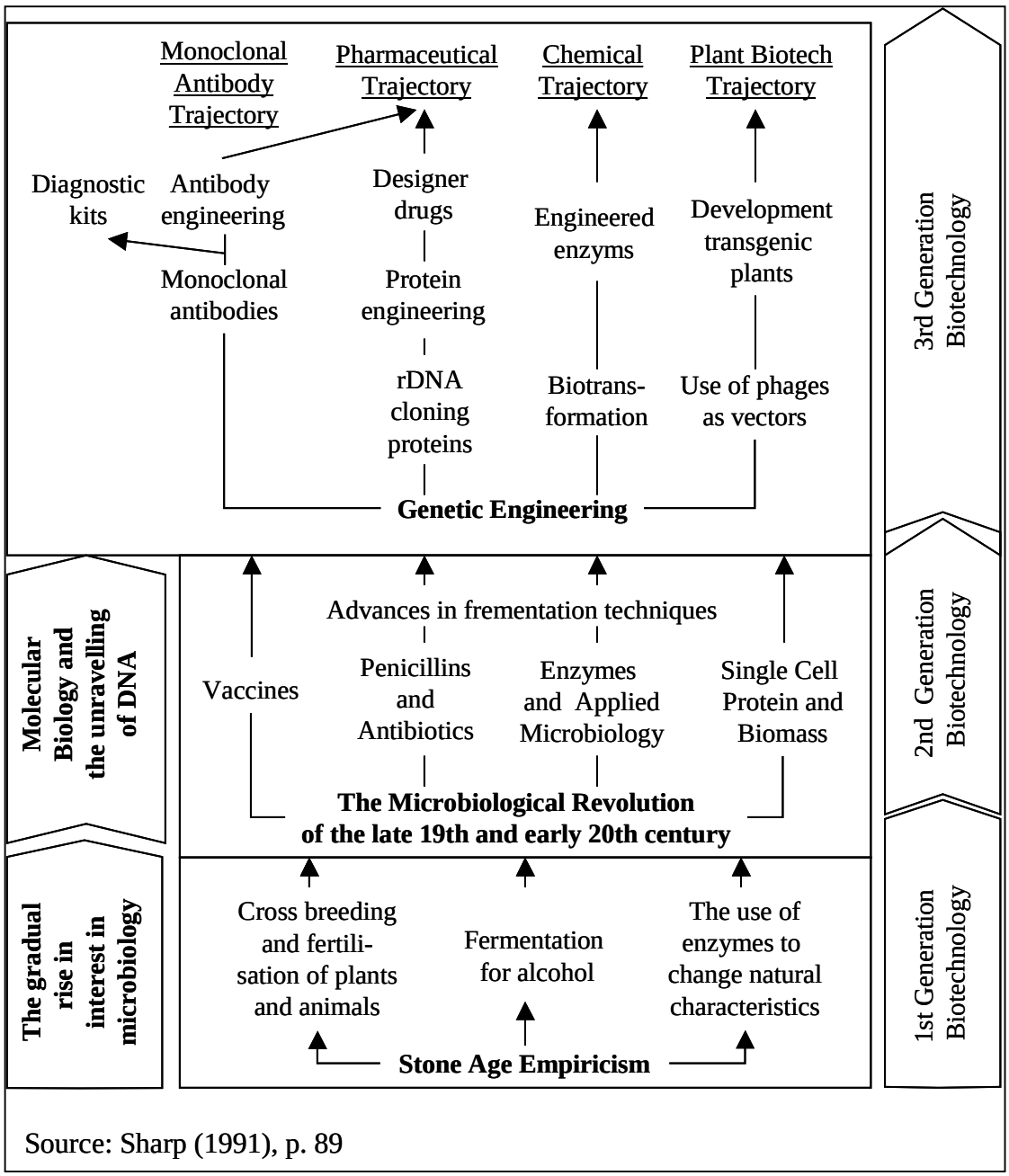

Figure 10: Three generations of biotechnology

The development of ‘new biotechnology’ has been characterized by Wirth (1994) in four phases, whereas this study is adding a fifth phase. The *first phase*, the so-called research phase, lasting from 1970 to 1980, was dominated by two pathbreaking discoveries that revolutionized molecular biology, and, therefore, is discussed a little more in detail than the subsequent phases. These two separate scientific discoveries formed the basis of ‘new biotechnology’ (Barley, Freeman & Hybels, 1992). First, in 1973, Herbert Boyer of Stanford University and Stanley Cohen of the University of California at San Francisco reported the

discovery of recombinant DNA (rDNA). Their experiment involved the insertion of a foreign piece of frog DNA into a host genome. rDNA technology is used to propagate DNA fragments inside a foreign host (vector). The first experiments dealt with the insertion of foreign DNA into E. coli, a well characterized bacterium with a ring-shaped plasmid DNA structure. The foreign DNA fragment was a gene governing the production of human insulin. Second, in 1975, Cesar Milstein and Georges Kohler of the British Medical Research Council discovered monoclonal antibodies (MABs) by fusing cells from a mouse myeloma with cells derived from mouse B-lymphocytes to create a 'hybridoma'. The human defenses against infectious agents are specific proteins called antibodies, which continuously confer resistance against diseases. It is possible to use antibodies therapeutically, as vaccines, and for diagnostics purposes in order to detect abnormal substances in the blood. With the help of MABs technology an efficient way to mass produce antibodies is provided (Zaby, 1999).

Although the science of these two process innovations was characterized by very considerable uncertainty and speculation, biotechnology's potential excited high levels of interest. In this *first phase*, universities and research institutes played a critical role in biotech's emergence, not only as the places where young scientists were educated, but, particularly, as the sources of breakthrough discoveries and techniques that fostered scientific and technological innovation (Powell, 1996). Hence, most biotechnology firms have been started by scientists with the help of either venture capitalists, specialized law firms, or ex-pharmaceutical executives.[15] Zucker, Darby & Brewer (1994) show in their study that the growth and diffusion of intellectual capital was the main determinant of where and when the American biotechnology industry developed. They compared the timing and location of new biotech firms (NBFs) with the presence at a particular time and place of 'star' scientists who are actively contributing to the basic science.

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[15] Kenney (1986) has analyzed the development of biotechnology from a university-industrial perspective. Olson (1986) points out that the biotechnology industry has (and will always have) a vital interest in establishing and maintaining ties with academic research institutes through a variety of cooperative agreements, because most of the basic techniques that has given rise to biotechnology has originally been developed in university laboratories and other research institutes.

The *second phase*, from 1980-1985, is considered as being the pioneering phase. The first product of a biotech company made by recombinant DNA, human insulin, was marketed in 1982 and was soon gaining appreciable market penetration. In 1983, first experiments with genetically modified micro-organisms were allowed to be carried out in the U.S., and, in 1985, the first genetically produced hepatitis B viral antigens were introduced.

The *third phase*, starting with the year 1984, is regarded as being the first prospering phase of biotechnology, because there have been strong indications that the real 'take-off' point for the large corporations came in the years 1984-1985. Big-firm investment in commercial biotechnology in the U.S. increased dramatically. Having remained relatively static through the early 1980s at approximately $200 million a year, it rose to $300 million in 1984 and jumped to $1.2 billion in 1985 (OTA, 1988). In 1986, alpha-interferon, used for the treatment of leukemia, received approval by the FDA, and, in 1988, the first cloned mouse was patented in the U.S.

The *fourth phase*, identified by Wirth (1994), has started in 1990 and is perceived as the real prospering phase of biotechnology leading to new opportunities. However, this study puts the end of this phase to the year 1996, due to the fact, that, henceforth, the financing window for biotechnology has been closed.[16] In 1990, the first experiment to treat ADA-deficiency genetically took place, and, in 1992, the U.S. Trade Office has worked out new rules for biotechnology as well as genetic engineering according to which genetically developed products are to be treated equally as conventional products. In the same time, the market share of drugs and diagnostic methods, based on biotechnology, has increased steadily. By the end of 1994, more than two dozen biotech drugs and vaccines had been approved by the FDA, more than 200 medicines were in various stages of clinical testing, and approximately two dozen drugs awaited FDA approval (Powell, 1996).

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[16] DeCarolis and Deeds (1999) refer to the financing window as 'hot markets' which entrepreneurs may use in order to improve their access to capital by going public and taking advantage of investors' optimism.

The *fifth phase*, starting in 1997 and still holding on, is characterized by the discussion about necessary consolidation activities, on the one hand, and, the future 'dream' about the never-ending benefits of biotechnology, on the other hand. Pharmaceutical companies clearly understand the role that biotechnology companies play in developing cheaper, faster and more effective drugs. In this sense, they are considered as being the 'innovative engine' for the pharmaceutical industry. However, pharmaceutical companies are facing significant short-term earnings pressure, and it is uncertain whether they will be able to continue to provide biotechnology companies with the necessary amount of money they need to survive. Apart from that, institutional investors are not motivated by biotechnology's past performance and are looking for new areas to invest (Purcell, 1998). Today, this growing industry comprises a range from research-focused start-ups to mid-size companies with manufacturing capability and large pharmaceutical companies. The future prospects of biotechnology are also influenced by the increasing number of start-ups in Europe. This suggests that a so-called 'second wave' of biotechnology, now emerging in Europe, may lead to a more unified global infrastructure for discovery and implementation (Edington, 1998). This increasing interest in Europe is also exemplified by Exelixis' acquisition of German-based Artemis and the spinout of Atugen Biotechnology GmbH, located in Berlin, from Ribozyme Pharmaceuticals (Christoffersen, 1999; Stoiber, 1999).

Moreover, with the launch of the Human Genome Project in 1990, there was a growing perception that drug discovery was to undergo radical changes. First, the number of possible targets relevant for diseases was about to rocket. Second, new technologies like high-throughput screening or new bioinformatic tools in connection with combinatorial chemistry made it possible to test a large number of potential drug targets against an even larger number of chemical entities. Third, the growing awareness of the innovation deficit at pharmaceutical companies made them to look for alternatives: biotechnology (Drews, 1998b). The convergence of genomics and informatics heralds a new era of biomedical research, offering lots of opportunities. The principal contribution of genomics to date has been in the identification of new molecular targets for drug action (PricewaterhouseCoopers, 1998b). The challenge now lies in how to select targets with the highest probability of relevance to disease pathogenesis. The

development of new informatics tools to annotate, archive, and analyze the vast volume and diversity of datasets creates four immediate challenges (Poste, 1998):

- the design of systems architecture and hyperlinking tools for large-scale, heterogeneous distributed databases,
- the creation of novel algorithms for data mining in bioinformatics, cheminformatics, and population genetics,
- the assembly of comprehensive clinical databanks and their use for large-scale genetic association studies in order to define robust gene-disease risk correlations, and
- the development of encryption methods to protect proprietary data and to assure the privacy and confidentiality of clinical information.

Thus, the strategic direction for healthcare is clear. It will increasingly focus on the assessment of how individual genetic variations will affect overall health. From this it follows, that individual risk profiling will be at the core of information-based clinical trial. Hence, genomics and informatics have the potential of being among the dominant growth industries of the early 21st century.

(2) The development of the biotechn industry from an organizational perspective

As illustrated in the section above, university laboratories have played a critical role in developing the scientific fundamentals of biotechnology. However, it was the dedicated biotechnology firms (DBFs), also referred to as new biotechnology firms (NBFs) or entrepreneurial life sciences companies (ELISCOs), that commercially exploited the results of the research. Gilis (1998) compares the factors of success in starting a successful biotechnology start-up in the early phases with those in the latest ones. *First*, the former naiveté with the dream of the potential uses of recombinant DNA technology has now been replaced by frenetic cynicism that accompanies an industry which knows there will be winners and losers. *Second*, the struggle for investor support has become far more competitive. The vast majority of the NBFs were financed by venture capital firms and later by IPOs that were usually carried out on the NASDAQ exchange

in the U.S. and for German companies on the 'Neuen Markt' in Germany.[17] *Third*, where once good science was enough to attract investors, now founding management needs relevant and successful industry experience. *Fourth*, in the early days neither investors nor entrepreneurs paid much attention to whether the focus was on licensing one's inventions to a third party or on attempting to build a fully integrated company. Today, however, biotechnology start-ups need a complete and bulletproof business strategy. *Fifth*, the beginning of a technological revolution without much competition has given the way to far too much competition. The NBFs represented a new type of organization, because they typically originated from within the leading research institutes and universities and kept close ties with academia.

The scientific breakthroughs of biotechnology constituted a radical change from previously dominated technologies in the human health care sector. Hence, in the sense of Schumpeter (1934), Abernathy & Clark (1985), and Tushman & Anderson (1986), "biotechnology is a dramatic case of a competence-destroying innovation" (Powell & Brantley, 1992, p. 368). Technological change in this case builds on a scientific basis (immunology and molecular biology) that differs significantly from the knowledge base (organic chemistry and its clinical application) of the established pharmaceutical industry (Powell, 1993).

Internally, biotechnology firms are organized flexible in overlapping interdisciplinary project teams. Thus, the firms have minimal hierarchy and sometimes they have even created their own postdoctoral fellowship program. Obviously, biotechnology companies have merged the practices of academy with the requirements of high tech industry in order to create a lean and effective organization for drug discovery and commercial development (Powell, 1996). Small biotechnology firms require large financial support and regulatory savvy, while larger pharmaceutical companies desire access to the research prowess of smaller companies. However, during the early years of biotechnology's development, most established pharmaceutical companies remained on the

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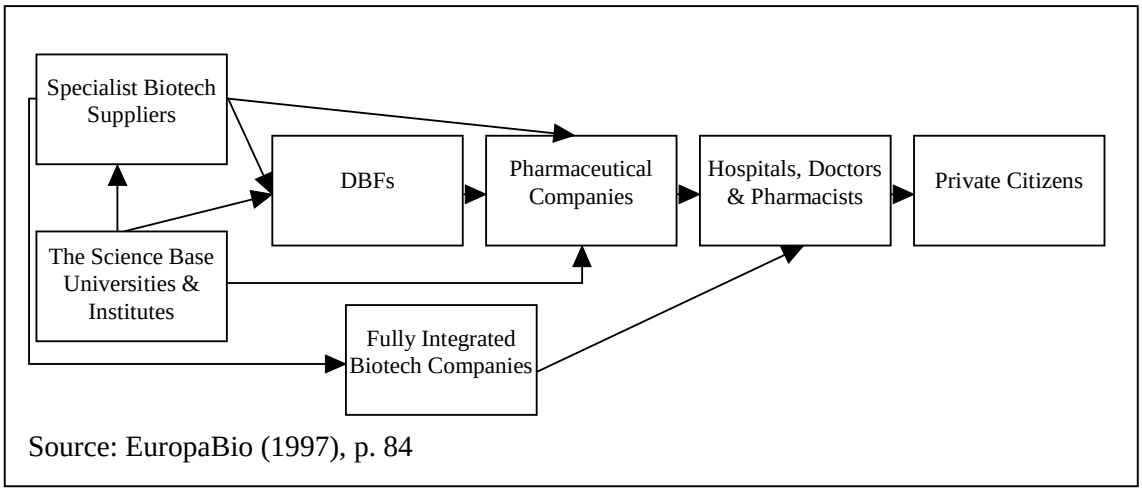
[17] Two German biotechnology companies have a dual listing on the NASDAQ and on the 'Neuen Markt'. These two companies are Qiagen N.V., which is incorporated under the laws of the Netherlands and is headquartered in the Dutch town of Venlo, and Lion Bioscience AG, headquartered in Heidelberg.

sideline, which Powell (1993) also called a ‘wait and see approach’. As a consequence, pharmaceutical companies found themselves losing out in competition, because there was a lack of trained workforce in biotechnology, and, moreover, they were unable to create an internal environment that was comparable to university or biotech laboratories (Powell, 1996). It is evident, that the full range of relevant skills needed to develop therapeutic drugs is not readily found under a single roof. Whereas the necessary basic and research skills to create a new product are found either in universities, research institutes, or small biotechnology companies, the cash needed for product development, clinical trials, and world-wide marketing is located in large pharmaceutical companies. Hence, the players in this field have turned to numerous forms of collaboration such as joint ventures, research agreements, or licensing agreements (PricewaterhouseCoopers, 1999b). According to Freeman & Barley (1992) the biotechnology community as a whole includes at least nine categories of organizations: new biotechnology firms (NBFs), university departments, research institutes, established corporations, venture capital firms, regulatory bodies, industrial associations, scientific bodies, and suppliers.

At its current stage of development the biotechnology industry is closely connected with the established pharmaceutical industry and thus can not be seen as fully independent. According to EuropaBio (1997) biotechnology is considered as being an integral part of the pharmaceutical sector. This interrelation is captured by Figure 11 which depicts an overview of the biotechnology value chain for human health care.



Source: EuropaBio (1997), p. 84

Figure 11: Biotechnology value chain for human health care

Formela (1998) describes four possible business models reflecting a new generation of biotechnology companies which are focusing not on specific vertical applications, but providing technology to their customers:

- First, a purely horizontal, non-exclusive model, such as Incyte, plays the role of a dominant content provider.
- Second, the pure tool/component model, such as Affymetrix or Perkin Elmer, aims at creating and protecting a standard in a complex, fast-moving and immature environment.
- Third, system integration, such as Millennium, focuses on being a fully integrated discovery company which integrates new tools into a platform that can then be licensed to customers for use on specific applications.
- Fourth, the fully integrated pharmaceutical company, such as HGS, may be another option.

Whatever business model will be chosen – again a more detailed discussion about business models in the biotechnology industry can be found in Meinhardt & Schweizer (2001) – these trends will foster M&A transactions within the biotechnology industry, particularly if one considers M&A as a possible exit strategy for biotech investors.

There are two more questions which have to be answered: One, how can the competitive situation in the biotechnology industry be characterized, and, two, what is the organizational structure of the biotech industry. According to Liebeskind et al. (1996) this industry is placed in an extremely challenging, hypercompetitive environment, compounded by appropriation problems, high levels of uncertainty, and critical resource immobility. *Hypercompetition* stems from the fact that biotechnology itself is a revolutionary technology with lots of rapid technological innovations. Hence, biotechnology firms can sustain a competitive advantage only by continuous innovation which results in valuable and patentable products. *Uncertainty* comes from its leading edge technological character that makes it impossible for biotechnology companies to determine in advance if any particular research program in which they invest will lead to a valuable discovery or not. *Appropriation problems* arise from the fact that according to patent laws, only firms which are first to discover a product or

process can reap any financial rewards from it. Thus, incentives for rival firms to appropriate scientific knowledge that is not already protected by patent laws are created. *Intellectual resource immobility* is caused by the scarcity of real 'star' researchers being able to make commercially valuable discoveries. Because many of them work in universities, biotechnology firms need to develop organizational arrangements which give them access to these valuable, but scarce, external intellectual resources. The overall need for strategic partners is seen as one of the biggest issues facing biotechnology firms.

As a consequence of this, the second question concerning the organizational structure of the biotechnology industry needs to be answered. The biotechnology industry is more than any other industry characterized by a social network structure which exists in order to ensure the reliability of scientific information due to well defined and socially enforced norms, reciprocity, respect for individuals' intellectual property rights, and honesty in research (Blau 1973; Crane 1972; Merton 1973). Liebeskind et al. (1996) define a social network as

> *"a collectivity of individuals among whom exchanges take place that are supported only by shared norms of trustworthy behavior. [...] We define a social network that includes members of more than one legally-defined organization as a 'boundary-spanning' social network". (Liebeskind et al., 1996, p. 430-431)*

Given that social network structure, a better environment for efficient organizational learning and also enhanced flexibility for responding to unpredictable changes is provided. Social networks allow the exchanges between legally distinct entities without competitive pricing or legal contracting. A prerequisite for this is that a shift from coordinating the internal activities of the firm through a command and control structure to providing organizational support for internal as well as external exchanges takes place. As a consequence of this, there may then be an extend in the scope of organizational learning, a better integration of knowledge in the firms participating in the social network, an increase in the operating, organizational as well as strategic flexibility, and a more efficient self-coordination among the employees involved.

Powell (1993) points out that biotechnology – compared to traditional business – operates according to a different logic, one in which firms must be expert at both

in-house research and cooperative research with external partners. In this context, external linkages are considered, on the one hand, as a means of gaining fast access to knowledge and resources that can not be provided internally and, on the other hand, as a test of internal expertise and learning capabilities. In fact, the pattern of interfirm collaboration in biotechnology is probably more extensive than in any other industry (Powell, 1993; Powell & Brantley, 1992; Barley & Freeman 1992; Arora & Gambardella, 1990). Powell (1996) states that networks of collaborative ventures serve as the primary institutional arrangement governing exchange and production, because due to the rapid technological developments, research breakthroughs are so broadly distributed that no single firm has the internal capabilities necessary for success. The models used for overcoming the respective deficiencies (e.g. the lack of downstream capabilities for bringing the new drugs to market such as clinical development and trials as well as marketing or cash-shortage) were cooperative agreements and partnerships, minority investments, joint ventures, and licensing (Pisano, 1997a; Shan, 1990).

Greis, Dibner & Bean (1996) distinguish four different types of partnership agreements: (1) research contracts or minority investments for the purpose of gaining a window on new technologies, (2) licensing and marketing agreements to obtain the use of a particular technology, (3) corporate alliances such as joint ventures with or without the transfer of equity, and (4) mergers and acquisitions. Interestingly, in their study mergers and acquisitions are regarded as types of 'partnership' agreements. Of course, up to now no hostile takeover has taken place in the biotechnology industry. Hence, one may consider M&A as a partnership agreement. But now, times have changed, because the pharmaceutical as well as the biotechnological industry undergo a radical transition enforcing both sectors to act. Therefore, it cannot be excluded that either a big pharmaceutical company or even a biotechnology firm, rich in cash or stock – however feasible and likely this in reality may be – will try to carry out a hostile takeover.[18]

[18] Of course, the specific industry structure and the strong dependence on tacit knowledge will make a hostile takeover difficult, but nevertheless not impossible.

Moreover, Greis, Dibner & Bean (1996) emphasize the double layer of innovation by pointing out that "the locus of innovative activity is no longer the firm, but a network of inter-organizational relationships which are controlled by different firms" (p. 612). The existing networks of relationships in biotechnology span a broad spectrum of industries rather than one single industry as well as national boundaries. It has become clear that biotechnology companies cannot rely solely on internal knowledge development. In contrast, they need to absorb knowledge from external sources. Hence, one of the most crucial competitive advantages of biotechnology companies is their speed and capacity in absorbing new knowledge, because this industry heavily depends upon the continual accumulation of relevant knowledge (DeCarolis & Deeds, 1999). A detailed overview of strategic alliances in the biotechnology industry can be found in Goldman Sachs (2000 & 2001).

The simultaneous restructuring of the pharmaceutical industry, biotechnology's development, and resource scarcity have created circumstances in which M&A is a probable solution to occur.

(3) The development of the biotechnology industry from a finance perspective

The development of the biotechnology industry has triggered the question of how this technology should be financed. Financing a biotechnology company is the result of interactions between entrepreneurs, venture capitalists, management teams, investment bankers, research analysts, and institutional investors (Hurwitz, 1999). The role and influence of each player depends on which stage the company is in.[19] To date, moreover, the biotechnology industry has enjoyed more funding by governments, international pharmaceutical companies, the equity capital markets, and the venture capital community than virtually any other high-growth sector in the worldwide economy.

Teitelman (1989) describes Wall Street's initial attitude to biotechnology as 'biomania'. In 1980/1981 biotechnology investments in the U.S. were attracting nearly $100 million of venture capital (Hacking, 1986). Wall Street's overall

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[19] Birndorf (1999) provides an interesting overview for bioentrepreneurs of when to raise how much cash from whom.

relationship with biotechnology has, however, been extremely variable, being hot and cold on a number of occasions. In its early enthusiasm for the technology it ensured that many NBFs enjoyed substantial funding. Pierce (1999) analyzed the fates of the U.S. industry pioneers – companies that have been public for at least a decade. This study includes 41 biotechnology companies that had gone public by the end of 1988 and raised nearly $10 billion in venture capital, equity, and debt financing. Of those, 27 are still continuing to exist as stand-alone entities, and barely half are profitable. Large, established pharmaceutical companies were generally slow to become involved in biotechnology, but, nevertheless, have been devoting considerable resources to it, and many also have acquired NBFs.

The restructuring and reorganization within the two primary sources of biotechnology funding – pharmaceutical companies and the institutional investment community – now pose a threat for the continued growth of the industry. On the one hand, the short-term earnings pressure on pharmaceutical companies to maintain their valuations will probably result in a reduction of discretionary dollars traditionally used for biotech funding. On the other hand, the bull markets that institutional investors have enjoyed, combined with the inconsistent market performance of biotechnology investments, have reduced their interests in future investments.[20]

From the point of view of the institutional investor, four trends have emerged that force a different set of priorities (Purcell, 1999). One, institutional investors are managing more and more money as a result of continued escalation in equity prices, inflows to mutual funds, and increased merger and acquisition activity. Two, due to the growth in average fund size, fund managers need to take larger

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[20] Menzel (1998) points out that accessing the capital markets is not simply a function of the strength of prevailing conditions. Of course, knowing when the company is truly ready is the first step. Thus, he stresses some prerequisites for an IPO: (1) evidence of a compelling and differentiated business model, (2) equity story that is easily to articulate to investors, (3) proof of concept for technology platform, (4) advanced clinical trials, (5) validation from pharmaceutical partnerships, (6) strong intellectual property position, (7) strong management and scientific base, and (8) specific post-IPO milestones. But, fulfilling these prerequisites is simply not enough. Knowing when the company is ready to access the capital markets is a balance between internal as well as external factors, which means being ready to access capital markets at the right time in the right cycle when a financing window is opened.

and larger positions in order to make investments meaningful to the portfolio's bottom line. Three, volatility in the stock market has significantly increased the need for fund managers to hold stocks with greater liquidity. Four, Coyler (1999) stresses that investors' caution in the biotechnology sector is rooted in its historical return, which means that the additional risk assumed by biotech investors is not being rewarded within a reasonable time. Investors in the average biotech IPO in 1993 have enjoyed on average only an 8% return through 1998, whereas the return to investors in the average U.S. pharmaceutical company over the same period counts for 36%.

The restructuring of these two industries will ultimately provide new opportunities for biotechnology companies, if they succeed in adapting to this changing environment. From this it follows, that the dilemma for biotechnology companies is how to manage this new environment, in which the drug companies who still believe in them no longer have excess discretionary dollars to spend and the institutional investors with discretionary dollars to spend are not true believers. The short-term strategic answer is to find ways to give both providers what they need. First, biotechnology companies have to become as financially innovative in their interactions with pharmaceutical partners as they are scientifically innovative by using creative financing structures such as off-balance sheet or product debenture financing. Second, they have to develop a critical mass – either through organic growth, consolidation, or collaborative agreements – in order to meet the needs of the pharmaceutical industry as well as the institutional investment community. Third, they have to become more skillful in addressing the needs of the institutional investors by changing their business model to fit better the risk/reward profile of potential investors (Purcell, 1998 & 1999).

For companies which are not able to survive by following these short-term strategies, they must look to alternative business models to provide them with enough cash to develop their technology and products. One widely discussed solution to this cash-shortfall is industry-wide consolidation – either through biotech-to-biotech or pharma-to-biotech merger. Because of pharma companies being rich in cash, the latter one will be the most probable solution ahead. Of course, in a first step, biotech companies will try to remain independent due to the fact that (1) in some cases neither the board of directors nor the management

teams realize the urgency of creating shareholder value on a sustained basis in the near or immediate future, (2) senior management wants to protect existing jobs, and (3) the emotional attachment between entrepreneurs and the companies they have created overshadows logic (Esposito & Ostro, 1998).

In addition to that, two factors suggest that perhaps now, more than ever, the time is ripe for more consolidation in the biotech industry. The first reason is the growing disparity in valuations between large-capitalized and small-capitalized biotechnology companies. Ostro & Esposito (1999) show that large-capitalized biotech companies have performed better than the NASDAQ Composite Index over one year (12/97-12/98), while the small-capitalized companies have been significant underperformers. The second factor is the dim financing environment, particularly for the small-capitalized companies. Actually, small-capitalized companies have approximately 15% institutional ownership while those with valuation over $1 billion have 45-60% of their equity held by institutional investors. It is estimated that over 50% of the biotechnology companies do not have sufficient cash for two years of operation (Malloy, 1999). If done correctly, biotechnology consolidation should create an environment with enough visibility for the new company to attract greater analyst coverage, diversify risks, and realize the operational and financial efficiencies to achieve success.

Of course, nobody will deny that biotechnology companies are important technical innovators and thus have an advanced understanding of the basic technology underlying the respective biotechnology firm's area of activity. Consequently, successful biotechnology companies live on the innovation edge, and need to master the state-of-the-art in their chosen activity. Hence, the competence that distinguishes a successful biotechnology firm is its ability to grasp and diagnose new, unique problems and to come up with innovative solutions. But, in the long run this fact is not enough to survive, because of what is clear from the remarks made before is that the biotechnology industry is undergoing a major transition – perhaps the greatest since it began – and that for those willing to adapt, there are many opportunities ahead. The major key changes are:

- Institutional investors are now resistant to invest in biotechnology, because of the small size of the companies involved and because of their lack of liquidity.
- The pharmaceutical industry is undergoing an M&A process, in which pharmaceutical companies are redefining themselves in ways that make them more risk averse and that make them also look for biotechnology companies that can provide them with a new range of solutions.
- The trend of 'niche' biotechnology companies has turned a number of these niche goods and services into commodities.

Obviously, the biotechnology industry is undergoing a fundamental change, leading to the creation of radically new business models. It seems, that a strategic consolidation resulting in fewer but stronger, larger, more market capitalized, and thus more financeable biotechnology companies is only a question of time. Basically, biotechnology companies can choose between two solutions in order to solve the problem of survival: a biotech-to-biotech deal or a pharma-to-biotech solution. This study will put its analytical emphasis on the latter one, the pharma-to-biotech solution, because there are too few biotechnology companies having enough money for the acquisition of a pharmaceutical company. The following section will provide some empirical evidence for the M&A activities in the pharmaceutical and biotechnology industry.

3.1.3 The inevitable need for M&A

"To buy or not to buy. That's the question." (Based on Shakespeare)

The last two sections contained a short description of the development and challenges of the pharmaceutical industry, on the one hand, and of the biotechnology industry, on the other hand. It has been revealed that both industries are undergoing radical changes and face lots of difficulties. Moreover, it has been shown that M&A is a (very) possible solution for both industries. The last two sections have also clearly demonstrated that both industries mutually depend on each other. One could even say that they live in some kind of

symbiosis in which one part merely can survive without the other. This section tries to combine the findings of the two last sections. To start with, Figure 12 shows potential future scenarios for R&D in the pharmaceutical industry. From this the interconnection between the two industries becomes, again, absolutely clear.

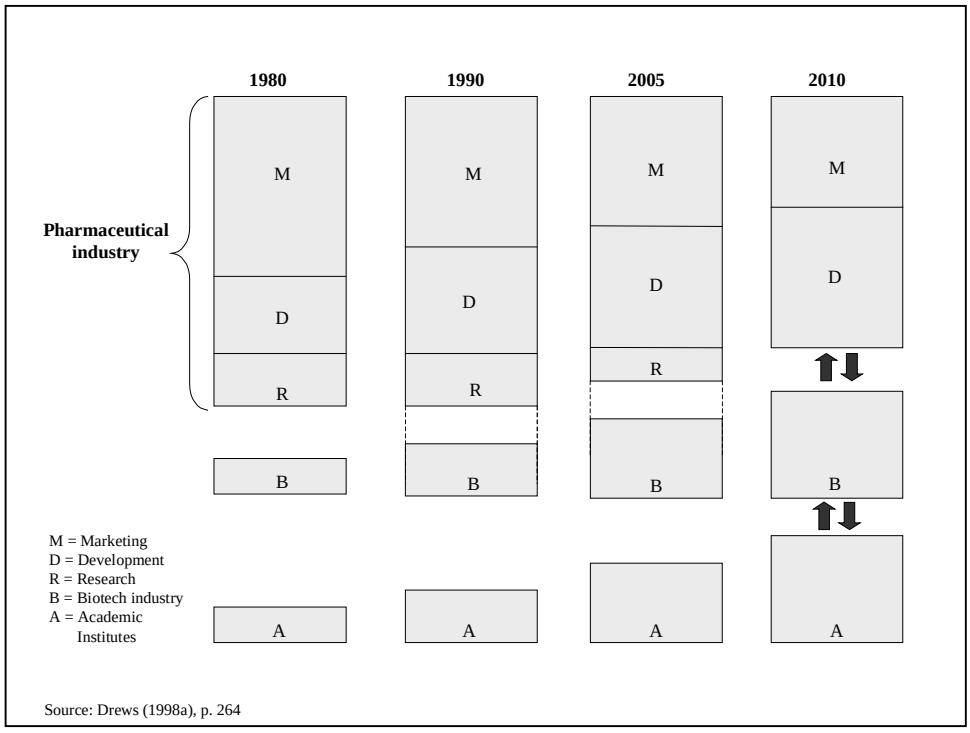


Figure 12: Potential developments of the interplay between biotechnology and pharmaceutical companies

Obviously, not only pharmaceutical companies are forced to act but also biotechnology companies face the need to act in order to ensure their future survival. Thus, possible reasons/motives for merger and acquisition activities in the biotechnology sector as they appear in the literature are collected as follows (Arnold, Grindley & Smart, 1999; Webber, 1999):

- IPOs become more and more difficult, because the window of IPO financing has been shut for the last years.
- High-profile clinical trial failures or difficulties are making investors wary of limited pipeline companies.
- Some venture capitalists are simply not ready to wait any longer to cash in their investment.

- On the sell side, there is a drive toward bigger investment banks, which is not only causing deal size to increase, but also making smaller capitalized stock less attractive.
- On the buy side, the ballooning of the average size of mutual funds in recent years means that many biotech market capitalizations and stock floats are too tiny for portfolio manager to consider.
- Too many biotech stocks have greatly underperformed.
- There is a great number of young biotech companies who desperately need money.
- There is a necessity to increase market capitalization in order to gain access to new investors.
- From the point of view of pharmaceutical companies there may be economies of scale and the possibility to exploit hidden values.
- The creation of a new product pipeline is considered as a possible explanation for consolidation activities in the biotech sector.
- The access to products and sales distribution channels is another very good reason for consolidation.
- Through M&A activities a completion of the existing intellectual property portfolio may be reached.
- The acquisition of manufacturing facilities and expertise may occur.
- Moreover, patent expiration in the pharmaceutical industry will result in a dramatic drop in sales.
- By internalizing a whole body of laboratory or product development capabilities, pharmaceutical companies try to overcome a lack of knowledge in a specific field or catching-up as late-entrants. In this context, biotechnology is seen as a competence-destroying technology (Tushman & Anderson, 1986). Moreover, established firms are considered as being unable to create internally a research environment that fosters this kind of innovation and discovery necessary to survive in the long run (Powell & Brantley, 1992; Powell, 1993).

All these elements appear to be in place for a major increase in M&A among biotechnology companies over the coming years. Having a closer look at the reasons for M&A activity in the biotechnology and pharmaceutical industry one can identify two fundamental reasons for their appearance: the *first* one steams

from financial necessities from the point of view of the biotechnology companies, which have to ensure their future survival, as well as the pharmaceutical companies, which need to make sure their high profitability margins. The *second* one is driven by the need to acquire knowledge in order to remain competitive in the future by having enough promising lead compounds as far as the point of view of the pharmaceutical companies is concerned. These two dimensions have also already been used to specify the target and buyer axe of the already introduced matrix in Section 2.1. The financing environment for biotechnology offerings was not robust in the last years and most of the companies are only in early-stage development of products and will face significant challenges to stay solvent. Pharmaceutical companies can mostly acquire broad-based technologies, such as drug delivery, more inexpensively and quickly than they can build the technologies internally. All in all, these are the two dominant motives which determine M&A activity in these industries.[21]

Major pharmaceutical companies have always had big interest in biotechnology companies, primarily to secure access to new technologies and products. However, these companies more commonly operated through licensing agreements rather than outright takeovers. Just to give a brief example, Glaxo Wellcome has entered into a number of collaborations agreements with biotechnology companies, but has made no major biotech acquisition since its $538 million purchase of Affymax in 1995. One of the reason for such a behavior has probably been the over-inflated valuations attached to biotechnology companies in the mid-1990s. In the meantime, these valuations have been adjusted downwards, making acquisitions more attractive and cheaper. Consequently, large biotech acquisitions have multiplied in the last years. Pharmaceutical companies are now seeing the possibility to acquire broad-based technologies cheaper (1) than they could have done before and (2) than they can build internally. In accordance with this argumentation, the total valuations of mergers and acquisitions which involved biotechnology companies have increased steadily from $3.3 billion in 1997, over $8.9 billion in 1998 and $13.7

[21] In order to gain a deeper understanding of the integration process, the motives for the M&A activities have to be analyzed in a first step during the case analyses. These identified motives will later be confronted with the motives found in the M&A literature.

billion in 1999 up to $19.0 billion in 2000. Apart from that, the average valuation attached to the acquisition of a biotechnology company has also increased from $129 million in 1998 over $191 million in 1999 up to $202 million in 2000 (Goldman Sachs, 2000 & 2001). The following Figure 13 summarizes the development of valuations of mergers and acquisitions that involved biotechnology companies during the last years.

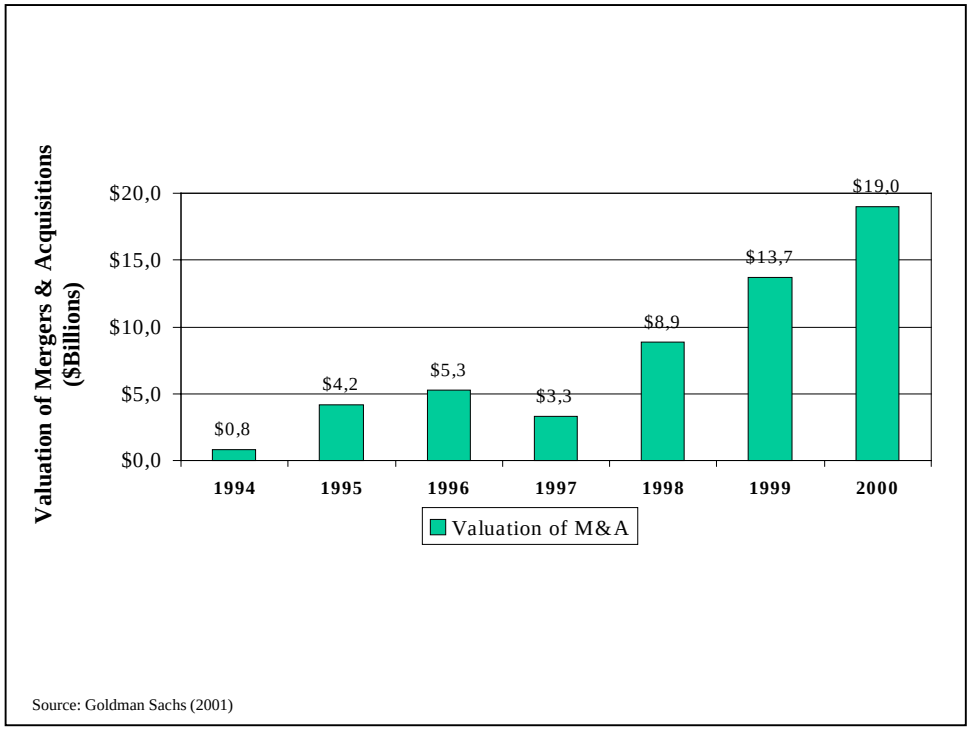


Figure 13: Valuations of mergers and acquisitions involving biotechnology companies

Moreover, of course not only the valuation of M&A activities has increased, there is also a considerable and steady rise in the total number of M&A activities between pharmaceutical and biotechnology companies as well as between biotechnology companies themselves, as it is shown in Figure 14. In 2000, there were 136 mergers and acquisitions, up 31% from 1999 and 62% higher than 1998. On the one hand, approximately 22 of the M&A activities involved pharmaceutical or chemical companies, versus 34 in 1999 and 20 in 1998. On the other hand, the M&A activity among biotechnology companies is increasing steadily, with 114 in 2000, 70 mergers and acquisitions in 1999, and 64 in 1998. This trend of increased M&A activities among biotechnology companies reflects the increasing financial strength of some big biotechnology companies, especially with its record high valuation in 1999-2000. Apart from that, the financial

markets have currently been rather weak for biotechnology offerings, which severely restricted the financing options for early public companies or privately held companies. Nevertheless, companies that managed to raise capital in 1999 and 2000 – as some of the major biotechnology players did – are relatively rich in cash and, therefore, are well positioned to acquire other companies.

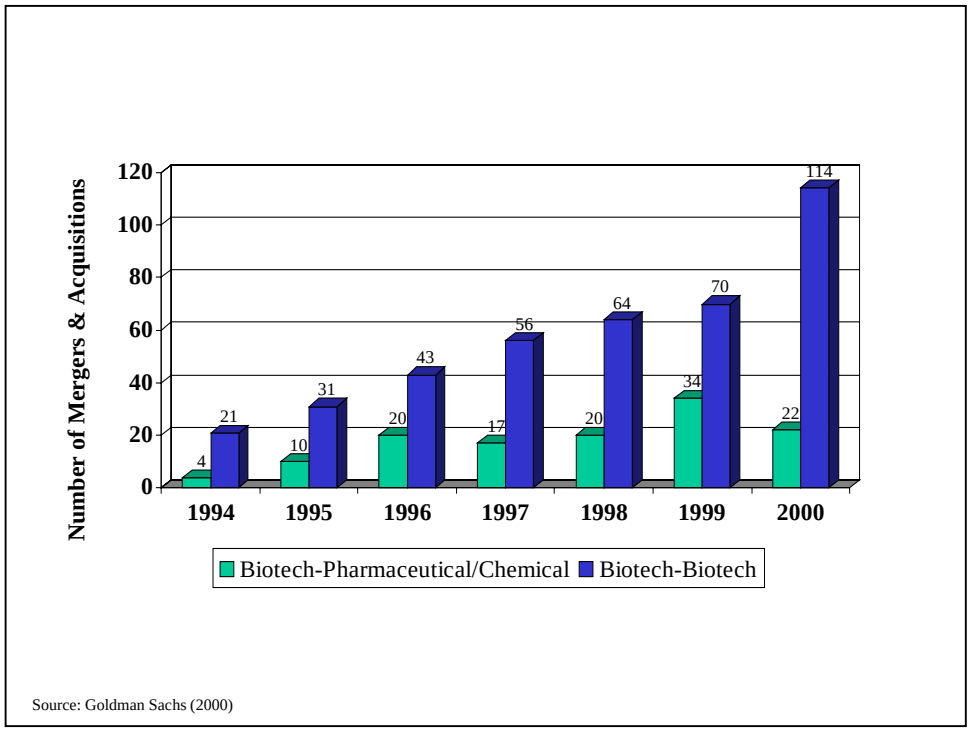


Figure 14: M&A activities in the biotechnology and pharmaceutical industry

Basically, we have two layers of M&A activity: first of all, the pharmaceutical industry itself – as already depicted in Figure 8 – is going through merger mania, and, second, consolidation activity in the biotechnology industry takes place. The latter one can be distinguished in biotech-to-biotech and pharma-to-biotech M&A activity. The following three tables provide an overview of the major biotechnology acquisitions valued at more than $100 million in 1998, 1999 and 2000 either in a biotech-to-biotech or in a pharma-to-biotech deal.

In 1998, the following 15 acquisitions were valued at over $100 million:

Target	Bidder	Deal value in million $
Carnick Laborities	Elan	150
Chiron Diagnostics	Bayer AG	1.100
CN Biosciences	Merck KGaA	150
DeKalb Genetics	Monsanto	2.300
International Murex Technologies	Abbott	234
NanoSystems	Elan	150
Molecular Dynamics	Amersham Pharmacia Biotech	256
Mycogen	Dow	325
Neurex	Elan	700
Penederm	Mylan	205
Molecular Simulations	Pharmacopeia	140
Sequus	Alza	580
Somatogen	Baxter International	188
TheraTech	Watson Pharmaceuticals	300
Tseng Labs	Cell Pathways	177

Table 2: M&A deals valued more than $100 million in 1998
(Source: Author)

The 16 biotechnology acquisitions valued at more than $100 million in 1999 (8 of which involved pharmaceutical or chemical partners) are the following:

Target	Bidder	Deal value in million $
Advanced Inhalation Research	Alkermes	114
Agouron	Warner Lambert	2.100
BioRad Laborities	Sanofi Synthelabo	210
Centocor	Johnson & Johnson	4.900
Chiroscience	Celltech	535
ClonTech	Becton Dickinson	200
Collagen Aesthetics	Inamed	142
Diatide	Schering AG	130
LeukoSite	Millennium Pharmaceuticals	635
Medeva	Celltech Chiroscience	950
NeXstar Pharmaceuticals	Gilead Sciences	550
North American Vaccine	Baxter	390
PE Corporation	EG&G Wallace	425
Research Genetics	Invitrogen	160
SUGEN	Pharmacia & Upjohn	650
U.S. Bioscience	MedImmune	440

Table 3: M&A deals valued more than $100 million in 1999
(Source: Author)

In 2000, 23 acquisitions of biotechnology companies were valued at more than $100 million, up from 16 in 1999 and 15 in 1998. Furthermore, eight of the mergers and acquisitions in 2000 exceeded $500 million, versus seven in 1999 and four in 1998.

Target	Bidder	Deal value in million $
ADL	Matritech	200
Anesta	Cephalon	444
Biochem Pharma	Shire	4.000
Biomatrix	Genzyme	245
Bradford Particle Design	Inhale Therapeutics	200
Catalytica	DSM	800
Celtrix	Insmed	140
Coulter	Corixa	570
DJ Pharma	Biovail	163
Dura	Elan	1.800
GelTex	Genzyme	1.000
GSI Luminomics	Packard Biosciences	120
Kinetix	Amgen	170
Life Technologies/ Dexter Corporation	Invitrogen	1.900
LJL BioSystems	Molecular Devices	263
Mallinckrodt	Tyco	4.200
NEN Life Science	Perkin Elmer	400
Operon	Qiagen	110
Oxford Asymmetry	Evotec	475
Pathogenesis	Chiron	700
Principa	Human Genome Sciences	120
Signal	Celgene	200
STC Technologies	Epitope	200

Table 4: M&A deals valued more than $100 million in 2000
(Source: Author)

In recent years, pharmaceutical companies have conceded the need to maintain earnings growth through product line expansion as opposed to an increase in drug prices. This has put an almost unbearable burden on internal R&D. Thus, pharmaceutical companies have had to gain access to novel drugs and technologies coming out of biotechnology companies. Although the majority of the interplay will take the form of collaborations ranging from R&D agreements to joint ventures, acquisitions have become a more attractive alternative.

Although the focus of this study is put on pharma-to-biotech deals, it seems reasonable to make some remarks about the relationship between mergers and acquisitions, on the one hand, and the overall development of strategic alliances, on the other hand, in which the role of mergers and acquisition becomes increasingly important. In 2000, there was a record of 933 alliances. The number of alliances in biotechnology has increased rapidly from 1993 to 1997, and peaked in 1998, as shown in Figure 15. In 1999, there were 720 alliances which represented a decline from 802 alliances in 1998. This decline was caused by two major reasons: (1) consolidation in the pharmaceutical and biotechnology industry has led to fewer potential partners, and (2) there is also an increase in size and scope of the alliances. The resurgence in the number of alliances was due to the more than 100 public biotech companies formed in 1999 and 2000. Apart from that, the pharmaceutical companies remain the most significant sponsors of biotechnology companies. However, the number of inter-biotechnology alliances has increased as well, and some of the biotechnology companies even acquire product rights from pharmaceutical companies in a reverse transfer deal.

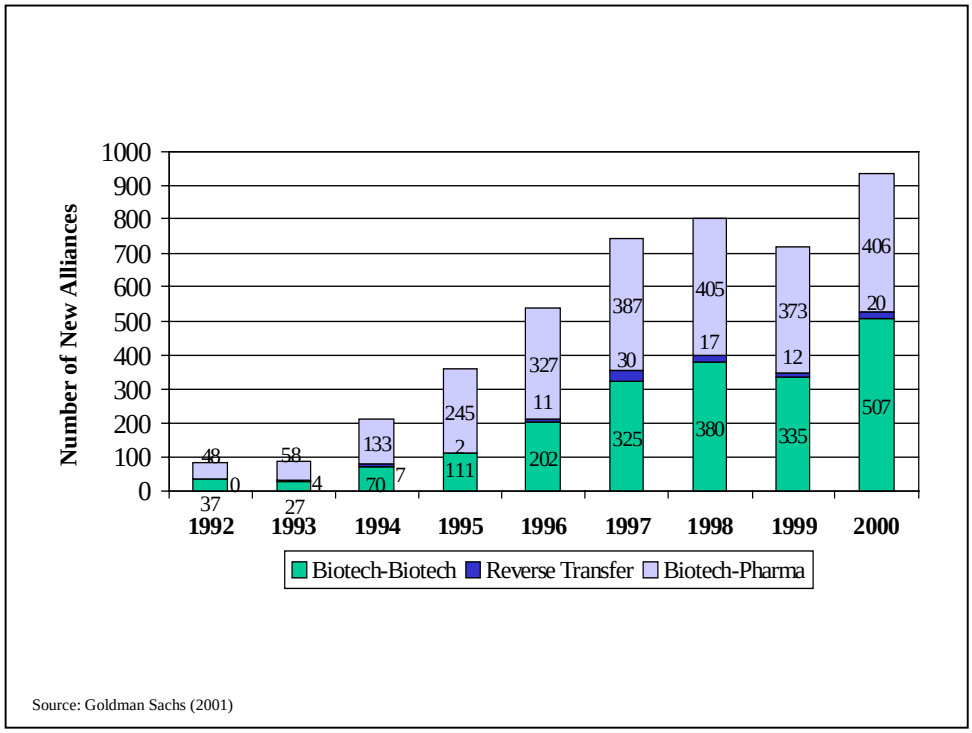
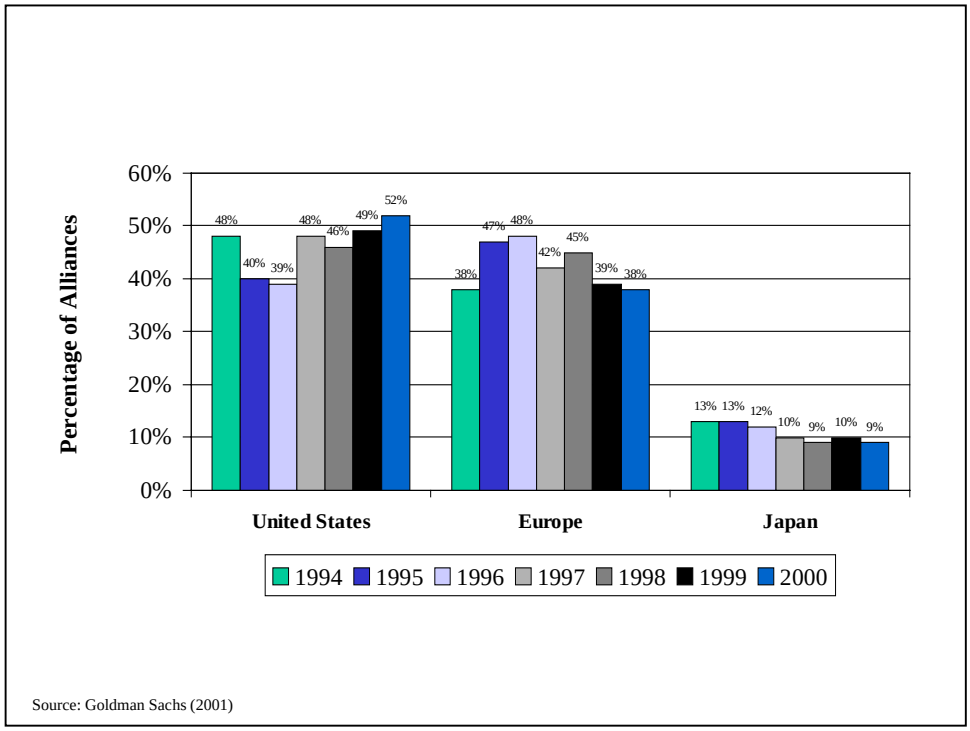


Figure 15: New Alliances between pharmaceutical and biotechnology companies

Having a closer look at the geographical distribution of pharmaceutical partners for biotechnology companies, there are both, U.S. and European pharmaceutical

companies that are active in establishing alliances with biotechnology companies. In fact, all major pharmaceutical companies have alliances with biotechnology companies. In this context, the U.S. pharmaceutical companies are still the dominant partners, accounting for 52% of all pharmaceutical-biotech alliances in 2000, up from 49% in 1999 and 46% in 1998. The percentage of European partners stayed essentially flat. Moreover, the percentage of Asian partners is also steady at 9%. The following Figure 16 gives an overview of the development of the geographic distribution, differentiated according to the U.S., Europe and Japan.



Source: Goldman Sachs (2001)

Figure 16: Geographic distribution of pharmaceutical partners for biotechnology companies

Having seen that the overall number of strategic alliances has increased and that pharmaceutical companies are still the dominant sponsor and partner of biotechnology companies, it is now necessary to analyze which part of the strategic alliances took place in the form of mergers and acquisitions. In this context, mergers and acquisitions are considered as part of strategic alliances. This also follows the classification of Greis, Dibner & Bean (1996). Figure 17 shows that the number of M&A activity – as part of strategic alliances – has increased steadily, implying that the industry is gradually consolidating and that the importance of mergers and acquisitions increases as well.

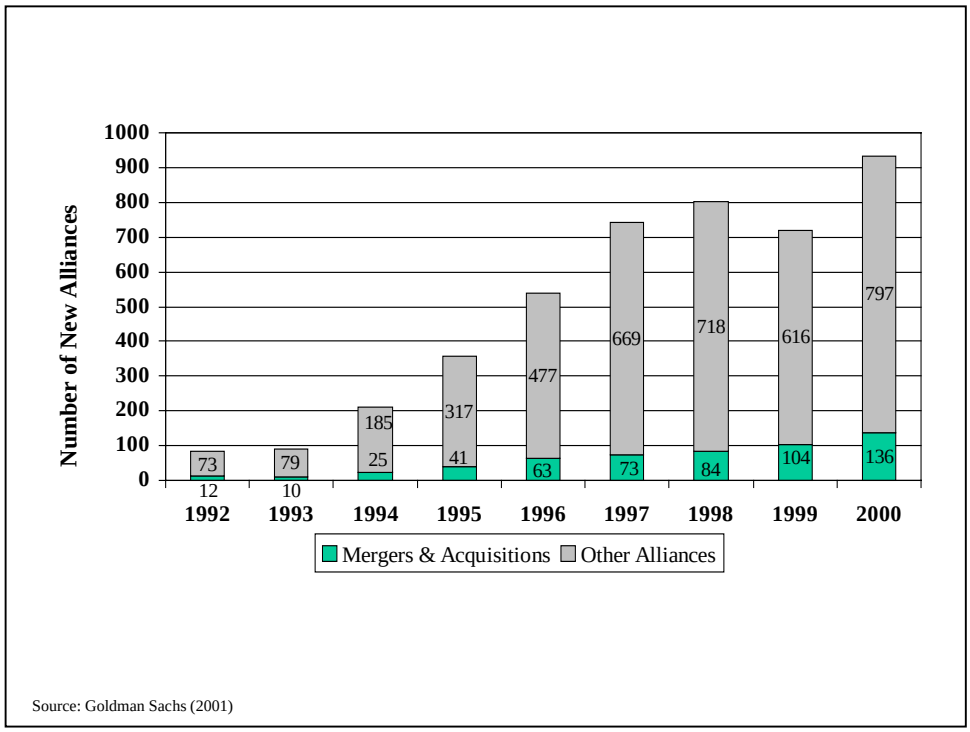


Figure 17: Gradual consolidation of the biotechnology industry through increased M&A activities

The analysis of the development of the pharmaceutical and biotechnology industry in the sections 3.1.1 and 3.1.2 has already come to the conclusion that both industries will notice a significant and continuous increase in M&A activity. After that, section 3.1.3 has tried to support and prove this argumentation by analyzing this development from an empirical perspective by highlighting major M&A activities between pharmaceutical and biotechnology companies as well as among biotechnology companies. Apart from that, the development of the M&A activities has also been confronted with other forms of collaborations in order to show the increasing importance of M&A. Thus, this analysis has made clear that there is an increase in the number of M&A activities between pharmaceutical and biotechnology companies. Nevertheless, it is interesting to notice that – up to now – there has not been that much of M&A activity in this sector than could perhaps be expected. Instead, biotech companies try to form a lot of alliances with many different pharmaceutical and biotechnology companies – as shown in the figures before – in order to ensure their survival. But, when the contribution of a biotech company to the success of the pharmaceutical company becomes more and more crucial – as the development in Figure 12 indicates – it is obvious that big

pharmaceutical companies will try to internalize this knowledge by acquiring this specific biotechnology company. And when this takes place, it is very important for the pharmaceutical company to ensure a smooth organizational integration of the biotechnology company in order not to endanger their innovative capability and the loss of their key knowledge holders.

The following section turns to the description and analyses of the different M&A and subsequent post-acquisition integration activities of the cases mentioned in Table 1. It is hoped that the analysis of the M&A activities in this section serves as a useful background for the rich understanding of the cases, but has also made clear why M&A deals between pharmaceutical and biotechnology companies are worthwhile analyzing.

3.2 The case of Pharmacia Corp. – SUGEN, Inc.

The objective of this case is to describe the post-acquisition integration activities of Sugen, Inc. into the organizational structure of Pharmacia Corp. First, a brief general corporate profile of Pharmacia as well as of Sugen will be presented. Second, the case will focus on describing the integration and collaboration activities between Pharmacia and Sugen, and finally the within-case analysis will be carried out.[22]

Corporate profiles

Pharmacia Corp., listed at the New York Stock Exchange, is a leading global pharmaceutical company created through the merger of Pharmacia & Upjohn with Monsanto, under the direction of its 1997 appointed CEO Fred Hassan. The roots of Pharmacia date back almost one hundred and fifty years to 1853, when a leading Italian pharmacist, Carlo Ebra, started his own company, which later became Farmaitalia Carlo Ebra and was united with Kabi Pharmacia in 1931. These two companies along with Pharmacia Aktiebolag, a Swedish-based company and a main part of Pharmacia & Upjohn, form the three main points of origin for Pharmacia AB. The Upjohn Company began in 1886 when W.E. Upjohn established The Upjohn Pill and Granule Company of Kalamazoo in Michigan. In November 1995, Pharmacia & Upjohn was formed through the merger of Pharmacia AB and The Upjohn Company. After the successful completion of this post-merger-integration process, which was characterized by cultural conflicts between the company's Swedish, Italian, and American components, profit warnings as well as a drop in share price, Pharmacia headed towards its next merger with Monsanto. Monsanto was formed in 1901, when a

[22] This case study draws on an exploratory conversation with Dr. Hans Melbinger (Former head of Pharmacia & Upjohn Germany) and on a transcribed interview with Dr. Peter Hirth (Former CEO of SUGEN, Inc.). The appendix includes an overview of the affiliations and job titles of all interviewees. Furthermore, this case is based on annual reports, public speeches, press releases by all companies named herein, the biotechnology information service Recombinant Capital (http://www.recap.com) as well as analysts' reports.

high-school drop-out and entrepreneur, John F. Queeny, founded the company in St. Louis and began producing saccharin, an artificial sweetener.

For the later within-case analysis it seems reasonable and is indeed necessary to make some remarks about the different deals, their problems and their subsequent integration processes, because this also explains some of the rationale behind the acquisition of Sugen. On the one hand, Upjohn was a rather mid-sized company that had some promising tools, but had suffered a prolonged period of poor productivity in its R&D. Furthermore, all processes from R&D over Marketing and Sales did not work together well. On the other hand, Pharmacia was some kind of collection of small Europe-focused boutiques with regional marketers of products focused on specialty customers and little research. This situation forced both companies to act and to become a strong player in the U.S. Because Pharmacia & Upjohn regards the U.S. market as the key market of the pharmaceutical industry or as Hassan said “the center of gravity in the pharmaceutical business”, it moved its headquarter from London to Peapack, New Jersey – while maintaining its strength in Europe. Fred Hassan was the central figure for the successful integration and can really be considered as an active integration manager who scheduled many time-consuming one-on-one meetings with managers from Pharmacia & Upjohn around the globe. In addition to that, he centralized and streamlined the organization. Pharmacia & Upjohn considered itself as being a globally networked company, which is one that has a global attitude, a kind of cross-functional, boundary-less behavior, shares information and works seamlessly across geographical regions. The organizational integration involved a high degree of interdependence which is required to create the expected value but has low needs for organizational autonomy. Integration in the case of Pharmacia & Upjohn implied, over time, a full consolidation of the operations, organizations, and culture of both organizations. The central idea behind this reorganization is expressed in the following Figure 18 at the example of the seamless product flow system of Pharmacia & Upjohn. This is a concept in which the whole organization is considered as being a product owner and the worldwide responsibility for R&D, Global Business Management and Global Pharmaceutical Operations lays in the hands of three executives, reporting directly to Hassan.

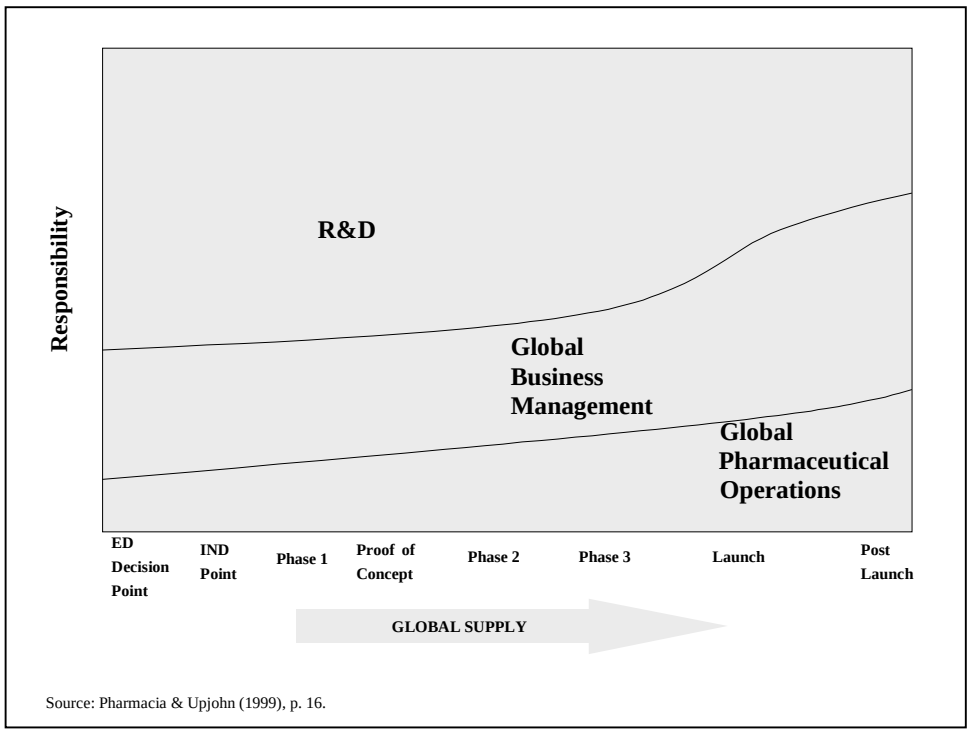


Figure 18: The seamless product flow system of Pharmacia

The merger between Pharmacia & Upjohn and Monsanto that resulted in the formation of Pharmacia Corporation was announced in December 1999 and finally completed on March 31st, 2000. The company estimates the total merger and restructuring costs at approximately $2.0 to 2.5 billion for a period of three years. The complimentary drug portfolio of both companies reduces Monsanto's reliance on *Celebrex* by adding several new therapeutic areas, and increases Pharmacia & Upjohn's exposure to new growth products, primarily *Celebrex*. Pharmacia & Upjohn has a broad international presence, while Monsanto derives the majority of its pharmaceutical sales from the U.S. Moreover, there are potential synergies in the area of marketing and sales as Pharmacia & Upjohn and Monsanto only have one key growth product (*Detrol* and *Celebrex*, respectively) for primary care physicians. The combined company has indicated it would have a R&D budget of more than $2 billion, representing approximately 19% of pharmaceutical sales, which is ahead of the average of the industry, estimated at 16%. Furthermore, from the point of view of Monsanto the major benefits are an immediate Earnings per Share accretion for their shareholders, a near-term segregation of their agricultural business, an opportunity for overhead reduction, a stronger balance sheet, and, especially, a strengthening of their drug business. Monsanto provides Pharmacia & Upjohn with vast genetic research capabilities

and especially with more exposure to the U.S. market, which is perfectly in line with Pharmacia & Upjohn's geographic strategy. During the integration process with Monsanto Hassan also scheduled a lot of one-on-one meetings with Monsanto employees and came up with two 'Hate-to-Loose Lists' for the most valued executives from both companies. The integration process was organized in the way that the two organizations first coexisted and then became increasingly interdependent.

As a result of these M&A activities Pharmacia has become one of the world's fastest-growing pharmaceutical company, with a strong portfolio of products, one of the best patent positions in the industry, and a robust pipeline.[23] Pharmacia's cuttings-edge research and development organization, with more than $2 billion spent on pharmaceutical R&D in fiscal 2000, representing 18.5% of total sales in the pharmaceutical segment of $12 billion, is responsible for an ever-increasing portfolio of new therapeutic compounds and medicines. At the same time, Pharmacia has become a leader in its ability to forge strategic partnerships, enhancing its research and development activities, and strengthening its products offerings. E.g., Pharmacia has established more than 100 R&D collaborations (alliances and partnerships) with external biotechnology partners worldwide. In fiscal 2000 the company reported with more than 59,000 employees worldwide total sales of $18 billion, of which 58% are attributable to North America, 20% to Europe/Africa, 12% to Asia/Pacific and 10% to Latin America. The company operates in three main business segments: Prescription Pharmaceuticals (including primary care, hospital care, cancer care, ophthalmology, endocrine care), Other Pharma Business (consisting of consumer healthcare, animal health, pharmaceutical commercial cervices, diagnostics) and the Monsanto Company (agricultural productivity, seed and genomics). Although the acquisition of Sugen was initiated and carried out by Pharmacia & Upjohn before merging with Monsanto, the name Pharmacia as well as Pharmacia & Upjohn will be used

[23] Pharmacia's current strength reflects the exceptional success of recent product introductions, such as *Celebrex* (osteoarthritis, adult rheumatoid arthritis, familial adenomatous polyposis), *Xalatan* (open-angle glaucoma) and *Detrol* (overactive bladder). But also, near and long term projects, including e.g. *Axert* (migraine), *Parecoxib* (pain), *Valdecoxib* (arthritis and pain) and *Camptosar* (lung cancer), will drive growth in the future. A detailed overview and evaluation of Pharmacia's pipeline can be found in Smith (2001).

synonymously during the case discussion, as Pharmacia is the actual name of the company and the integration process also overlaps.

Sugen, Inc., headquartered in San Francisco, CA, was founded in July 1991 by International Technology Investment Managers and grew out of a research collaboration between the New York University Medical Center and the Max-Planck-Institute for Biochemistry in Munich. The company's research and development efforts are based upon the pioneering accomplishments of the company's founding scientists, Dr. Axel Ullrich of the Max-Planck-Institute for Biochemistry in Munich and Dr. Joseph Schlessinger of New York University School of Medicine. Their initials also make up the 'S' and 'U' in Sugen. The company is a biopharmaceutical company focused on the discovery and development of small molecule drugs which target specific cellular signal transduction pathways. These signaling pathways are regulated by cell surface receptors. Focusing on this critical cellular process, Sugen employs an integrated array of drug discovery and development technologies to create a broad pipeline of novel pharmaceuticals to fight cancer and other illnesses. The company has used its understanding of the systems that regulate cell metabolism – in particular growth receptor tyrosine kineases (RTKs) and the receptor tyrosine phosphatases (RTPs) – to develop a number of products that may inhibit angiogenesis and halt tumor growth.

Before the takeover, Sugen was pursuing two business strategies for the commercialization of its products and technologies. In the cancer field, the company intended to build a vertically integrated oncology business in North America, with the objective of bringing to market a family of target-specific signal transduction inhibitors. Because of this, Sugen had also formed an European affiliate in Schaffhausen, Switzerland, in order to build a strong and profitable cancer business in Europe. Nevertheless, the company has also entered into collaborative agreements with different corporate partners such as Taiho Pharmaceutical Ltd., ASTA Medica AG, or Zeneca Ltd. Outside of oncology, the company's strategy was to seek corporate collaborations or joint ventures to which Sugen contributed validated targets, screening technologies and drug leads while the partner provided the disease-specific and drug development expertise as well as marketing experience. As part of this strategy, Sugen entered into a

collaboration with Vision Pharmaceutical, L.P., an affiliate of Allergan, Inc., Allergan, Inc., itself as well as ProChon Biotech Ltd.

3.2.1 Case description

Acquisition process and motives

On June 15, 1999, Pharmacia & Upjohn and Sugen announced the signing of an agreement under which Pharmacia & Upjohn would acquire complete ownership of Sugen with its 210 employees. This first biotechnology acquisition of Pharmacia & Upjohn since its formation in 1995 was finally completed on August 31st, 1999, and called for the exchange of approximately 12 million shares of Pharmacia stock for all outstanding common stock of Sugen. Each share of Sugen common stock was exchanged for 0.7248 of one share of Pharmacia common stock.[24] In addition, terms of outstanding Sugen stock options, stock warrants, convertible debt, and warrants on convertible debt were changed to convert Sugen shares into Pharmacia shares using the same exchange ratio. The transaction was valued at $650 million on a net basis.[25] In connection with the acquisition of Sugen, Pharmacia reported approximately $70 million in merger and restructuring expenses.

Pharmacia's decision to acquire Sugen can be put down to several motives. Some of the reasons why Pharmacia acquired Sugen are summarized in the following statement of Göran Ando, Pharmacia's Executive Vice President & President for Research and Development (Sugen, Inc., 1999, p. 2):

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[24] These are the official exchange ratios reported according to the notice of annual meeting of stockholders of June 23, 2000 – subsequent to the merger between Pharmacia & Upjohn and Monsanto. In the terms of the original agreement – prior to the merger between Pharmacia & Upjohn and Monsanto – it was agreed that each share of Sugen common stock was to be converted into 0.6091 of a share of Pharmacia & Upjohn common stock. The exchange ratio was based on the volume-weighted average trading prices of Pharmacia & Upjohn common stock from July 30, 1999 through August 26, 1999.

[25] From the point of view of Pharmacia, the timing of the acquisition was fairly good, because the valuations attached to biotech companies at that particular time were low. This means that Pharmacia could acquire Sugen relatively cheaply.

> *"Sugen's outstanding team of scientists has built a substantial technology platform including an impressive intellectual property portfolio, state-of-the-art genomics and bioinformatics, a large portfolio of novel targets and novel chemistries and a growing pipeline of candidates that will add immediate value to our research and development program. Our respective research organizations have complementary strengths that provide us with an opportunity to achieve significant synergies to build competitive advantage."*

This quotation reveals the first two major motives for the acquisition. In a *first* step, Pharmacia gained access to an interesting technology platform which could also be used in other therapeutic areas of Pharmacia such as dermatology or women's health, which only had some development, but no research activities up to that point. The *second* major reason was Sugen's promising pipeline with three compounds in clinical trials, two of them being already in Phase III trials.[26] The *third* reason for the acquisition, the strengthening of Pharmacia's competitive position in the oncology business segment, is reflected in the following statement of Fred Hassan, Chairman & CEO of Pharmacia, considering this acquisition also as a very valuable strategic move (Sugen, Inc., 1999, p. 1):

> *"In addition to enhancing our genomics-based drug discovery capabilities, this acquisition strengthens our oncology portfolio by providing us with new therapeutic approaches to the treatment of cancer. With the addition of the cytostatic platform represented by Sugen, we position Pharmacia & Upjohn to become the new challenger in the oncology category. The acquisition of Sugen is yet another example of the new strategy to supplement our internal R&D initiatives with external innovation."*

Furthermore, there is a *fourth* important motive for the acquisition concerning the overall growth strategy of the company which lays in the fact that the

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[26] SU101, an inhibitor of the platelet-derived growth facto receptor signalling pathways, was Sugen's most advanced product. The other two very interesting compounds were SU5416, an angiogenesis inhibitor, designed to inhibit the growth and spread of cancer, and SU6668, an anti-cancer drug candidate, blocking multiple targets involved in the growth and spread of tumors.

> *"Sugen acquisition is an important investment in sustaining P&U's long-term growth. Our previously-stated goal of annual double-digit growth remains unchanged". (Hassan; Sugen, Inc., 1999, p. 3)*

Having in mind that the valuation attached to biotech companies at that time was rather low it is worth asking why Sugen accepted the takeover bid. Before the acquisition the company's principal sources of financing have been its initial and follow-on public offerings of common stock, placements of the company's preferred and common stock and senior custom convertible notes, as well as funds received under the company's corporate collaborations. The total amount of capital raised by venture capitalists, public offerings and private placements between September 1991 and March 1999 was about $1.9 billion. Despite all these sources of financing, Sugen was not able to cover the cost for the clinical trials. After the acquisition the financing and liquidity situation changed, which is also reflected in the following statement of Stephen Evans-Frake, the former Chairman and CEO of Sugen (Sugen, Inc., 1999, p. 2):

> *"This agreement with Pharmacia and Upjohn provides Sugen with the resources, critical mass and global infrastructure to commercialize the cancer drug candidates in our pipeline far more rapidly than we could achieve on our own. It will also enable us to apply our unique capabilities to other important disease areas in which our efforts to date have been severely resource constrained because the hostile environment for financing made it difficult for us to remain independent."*

Apart from the main reason that Sugen simply needed money in order to continue its clinical trials, as "the burn rate during our clinical trials was very high" (Hirth), they also wanted to bring to fruition what they had already achieved.

Organizational integration

After the acquisition it was decided that Sugen remained based at its headquarter in San Francisco. Moreover, Peter Hirth, Sugen's Executive Vice President and Chairman R&D Committee, was appointed President of Sugen, because the former Chairman and CEO, Stephen Evans-Frake, decided to leave the company. The new President, Peter Hirth, reported directly to Göran Ando, Pharmacia's Executive Vice President as well as President of Research and Development. In

the following short statement, Göran Ando emphasizes what the overall organizational integration of Sugen should look like (Madell & Koberstein, 1999, p. 23):

> *"We will keep Sugen as an entity and continue with its identity."*

This makes clear that Sugen should continue to function more or less as an independent company, which is also supported by the following quotation of Peter Hirth, who had to set this structure in place:

> *"There was a clear commitment from Pharmacia to keep Sugen independently – as far as possible. They tried to keep up our identity, our name and so on. That's also what we have realized for most of the parts. However, in the long run it is a completely other question, because again and again there will be the struggle for the same budget in the future and the same rules will apply for us as for the other parts within Pharmacia."*

As far as the strategic integration was concerned, this was some kind of a "moving target" (Hirth) during the integration process:

> *"At the very beginning, Sugen was totally removed from the strategy process. But, the more interactions occurred and the more resources were transferred to Sugen, the more involvement was necessary. Moreover, Sugen was integrated into a big group which has to take into account the overall interests of the company as well as the shareholders and, thus, has to align its strategy, with Sugen being part of it." (Hirth)*

The strategy for the oncology business sector of Pharmacia was shaped by a special team in which a representative from Sugen was part of. This strategy was developed in close interaction with the Board of Pharmacia, especially with the President of Research and Development, Göran Ando. At the beginning, Sugen, i.e. the President of Sugen, Peter Hirth, reported directly to Göran Ando and was only responsible to him. After a certain time, some kind of dual reporting was introduced for late stage development in clinical trials, i.e., that also executives in the development area reported directly to their counterparts at Pharmacia. However, the information exchange between Peter Hirth and Göran Ando was

the dominant connection. The responsibility for Sugen, and along with that also the support, laid in the hands of the top management of Pharmacia.

> *"I reported directly to Göran Ando and, by this, to the top of the company which also had the responsibility for Sugen." (Hirth)*

In contrast to the overall strategic decisions made at the top of Pharmacia the day-to-day operational responsibility clearly laid in the hands of Sugen. There was no involvement from Pharmacia concerning the way in which the business was run at Sugen.

> *"It was possible to make local decisions with respect to the overall strategy developed at Pharmacia. And, as far as the day-to-day management was concerned the people at Sugen had a lot of freedom in which they could realize their own ideas. This also resulted in a feeling of independence, because decisions could be made locally. That was also something I spoke up for." (Hirth)*

Within Sugen the reporting structure was not changed, which means that most of it was done to the executives of Sugen, who then communicated with their respective counterparts at Pharmacia, e.g. at a director-to-director level. Apart from that, the financing and controlling instruments at Sugen needed to be adjusted to the way these mechanisms did work at Pharmacia. These alignments did not affect any critical decision systems at Sugen. Furthermore, aspects such as e-mail-addresses or fire walls were standardized, and Sugen also received access to information systems, confidential databases as well as libraries provided by Pharmacia. Moreover, Sugen could make use of Pharmacia's contacts to policies and health insurances.

The day-to-day collaboration between the employees of Sugen and Pharmacia was organized on a project-base, which means that people worked together in project teams. In fact, there was no exchange in the sense that employees of Sugen went to a site of Pharmacia in order to work there or vice versa.

> *"There was no exchange, there were rather teams coming together in order to work on a certain issue. But, an exchange that people from Pharmacia would have come to Sugen in a directing capacity, would not have been clever, because in most of the cases they would have been observed very critically." (Hirth)*

The exchange took place on the project level where different meetings and presentations were held. In addition, there is of course a big difference in the organizational structure of a small biotechnology company, on the one hand, and a big pharmaceutical company, on the other hand, as the following statement clearly points out:

> *"There are differences between the organizations. In our organization at Sugen, we had no border between research and development. We had a target, we had a drug, and then we decided to go in clinical trials. There is no ever-lasting decision process. In a big company, you find a real handling over between research and development. Especially at Pharmacia, there have been several boxes and their performance was measured by how many balls have been thrown over the wall into the next box. But, nobody cared about the fact that no one caught the balls on the other side of the wall. This kind of mentality caused some problems in terms of communication and understanding. [...] Because Sugen managed its projects quite independently this had almost no repercussions. For some of us, it was evident, because we were in those committees and realized what happened. However, the average Sugen-employee was not affected by it." (Hirth)*

This high degree of independence of Sugen is explained by the fact that the company was already far in Clinical Phase III and Pharmacia was aware of the fact that the know-how and competence for the final development was in Sugen. Hence, Sugen was granted the required degree of freedom to finish this project. Apart from that, during the integration process Peter Hirth also tried to ensure that a structure was set in place which makes it possible "to manage a project from A to Z locally without the interposition of any decision-making-bodies" (Hirth). After the development has been finished, Sales and Marketing will be taken over by Pharmacia. The rationale behind this is shown clearly in the following statement of Göran Ando, reflecting some of Pharmacia's overall strategic thinking (Madell & Koberstein, 1999, p. 22):

> *"The vast majority of our discovery are external investments. We access other companies' competencies because science is moving so fast. To internalize all of it takes too long a time, is too expensive, and will never catch up. This is a much more efficient model. I think this will continue."*

Concerning the transfer of knowledge a distinction must be made between the day-to-day research of Sugen and the more elaborated products in clinical trials. The basic research remains with Sugen and there is also no interference from the part of Pharmacia. After the acquisition a review process of all projects was done. During this process, which was carried out between both parties in a common effort and common agreement, a few projects were completely cancelled. Apart from that, it was decided that some of the projects and activities that concerned certain targets were terminated at Sugen and transferred to Pharmacia's site in Italy. As a countermove, some projects from Italy were transferred to Sugen.

> *"All projects that have been cancelled, have been cancelled with the agreement and support of Sugen. We had a lot of freedom in this context. There have also been a few projects in which we had to realize that it did not make any sense to work on targets at two different sites. Hence, some of the targets were moved to Italia and these activities had then been stopped at Sugen. Instead, other activities from Italy came to us." (Hirth)*

In such a situation a certain knowledge transfer enabling the people at Pharmacia to use part of Sugen's knowledge was necessary. The focus was more on specific genes and targets than on the technology platforms themselves. Moreover, the technology was also presented – but not transferred – to other business segments of Pharmacia.

> *"Indeed, there have been activities carried out that enabled our colleagues at Pharmacia to use our technology, especially everything that concerned the genes and the targets. All of this was catalyzed by certain project meetings, presentations and discussions. The specific focus was put on kineases. [...] There have been educational sessions as well as the supply of chemistry, chemical processes, databanks,... But, most of that was also done by the project teams." (Hirth)*

From the point of view of Pharmacia, the decision about the knowledge transfer was directed by the following rationale:

> *"We put together a small group of discovery scientists from all sides and said to them, 'Go away and think this through very carefully: What do we have in-house?*

What do we need in-house? What do we need to access but don't need in-house?'" (Göran Ando; Madell & Koberstein, 1999, p. 22)

From a cultural perspective there is one major aspect resulting from Pharmacia's history that had an impact on the integration. The company Pharmacia resulted from the merger of Pharmacia AB of Sweden having acquired the Italian company Farmaitalia, The Upjohn Company and Monsanto, both of U.S.-origin. Already the first integration process between Pharmacia and Upjohn was characterized by severe cultural conflicts between the company's Swedish, Italian and American components. It took Fred Hassan a lot of time and effort in order to get over these cultural differences and to make the different parts of the company work together effectively. Because of these experiences he was aware of the fact that whatever kind of cultural gap exists between Pharmacia and Sugen it needs to be handled very carefully.

"Of course, there are big cultural differences, which are already embedded in Pharmacia's history. Pharmacia & Upjohn which had acquired Sugen was created by the merger between Pharmacia of Sweden and Upjohn of the U.S. – each of them having very different cultures. Moreover Pharmacia had bought Farmaitalia, leading to a combination of Swedish, Italian and American components. This had caused some challenges. And then, Sugen on the top of that, which was in some way even far more away from any of them – that was not easy." (Hirth)

The question is now what the particular differences between Pharmacia as a big integrated group and a small biotech company like Sugen are. Part of the answer is given in the following statement by Peter Hirth:

"People coming to Sugen have a completely different mentality. They know that there is no job security and that there are high risks involved in terms of running out of money or failures. There is always an inherent risk of being taken over. People at Sugen must accept this high-risk proposition and also be able to live with it. They have also a different relationship to authority because they are more 'rebellious', are questioning authority and are always saying what they are thinking. They are also more focused on innovation. In fact, you cannot really compare those cultures. Either you keep the culture as it is or it disappears automatically."

Having this two extreme polar types in mind, it is necessary to think about possible consequences that might result from it.

> *"There is of course the danger that – sooner or later – Sugen will loose the people with this specific risk profile. It is possible to accept it for a while, especially as long as your are granted a certain autonomy, but then one has to realize that it is no longer the same as it is used to be." (Hirth)*

The acquisition of Sugen resulted in a significant increase in fluctuation, although the normal annual fluctuation in biotech companies located in the Bay Area had already been between 15 and 18%. Hence, Peter Hirth had the task to ensure that as many employees as possible stayed with the company. In order to realize this, they were offered a better employee's total compensation package including e.g. an increase in their salary, pension plans, or profit sharing/bonus programs. Furthermore, special incentive plans were introduced for people who remained longer than two years in the company. E.g., all regular full-time employees are eligible for long term service awards. After two years of service they receive $5,000, after three years $7,500, after four years $10,000, after five years $12,500 and after six or more years they receive $15,000.

> *"It was my duty to make most of them stay because the value of the company is in the people. We made a lot of things such as increased salaries, more benefits, bonuses and so on. However, money is not the crucial factor to keep somebody in its position – that is something I had to learn. The micro-environment is more important as well as the fact of how the position has a positive impact on the further personal development or not. In the end, it turned out, that a lot of people left." (Hirth)*

Apart from that, some of the employees also left because of the missing stock options. As the average age of people at Sugen was about 28 years, they were not yet interested in the pension packages offered – instead, they would have preferred to receive stock options. In addition, the top management of Sugen also left, e.g. with the closing of the deal, Stephen Evans-Frake, Chairman and CEO of Sugen, left and Peter Hirth became President of Sugen. Having completed the successful integration of Sugen into Pharmacia after one year, he also decided to leave the company in order to start and run a business on its own.

> *"I do not think that Pharmacia is not a good company. However, from my point of view there are other things that I personally find much more attractive to do. I rather prefer creating and innovating instead of just administering things. That is also something people at Pharmacia understand and accept. I left Sugen with a very good relationship to Pharmacia and I am still in contact with them." (Hirth)*

The acquisition of Sugen by Pharmacia provided the acquired company with much more opportunities in terms of resources and also gave the company a greater stability. The employees could be sure to receive their salary each month and some of the employees also considered the pension plans attractive. Additionally, the management could take care of other things like e.g. establishing stable interaction mechanisms between middle and top management or creating business development plans. These are things that had never been possible as long as they had been an independent, publicly-traded biotechnology company with no time left. Moreover, the scientists received a stable environment in which they could continue to do what they always did, research, now even with more resources and a better job security.

> *"For most of the scientists it is not money that really matters, it is fame and glory." (Hirth)*

Organization of the integration process

After the conclusion of the deal Peter Hirth was appointed President of Sugen and, by this, became responsible for the organization of the integration process from the point of view of Sugen. His counterpart at Pharmacia was Göran Ando, Pharmacia's Executive Vice President & President for Research and Development. Apart from that, Fred Hassan, Chairman & CEO of Pharmacia, was also involved in the integration process and participated regularly in the respective meetings. Furthermore, a merger integration team with regular meetings every two months was created. This team comprised the top R&D-people from both companies. In this context, it is worth mentioning that this integration needed to "cover a lot of different areas, because Sugen was at that point already in the middle of Clinical Phase III" (Hirth). Hence, they did not put one single integration manager in charge of it, but an integration team. The

following statement gives an impression of the organization of the integration process:

> *"The integration was carried out under the supervision and the support of Göran Ando. The CEO of Pharmacia, Fred Hassan, was also involved. Both of them were regularly at Sugen and worked with us. The merger integration team consisted of the top executives of R&D from Sugen and Pharmacia. The process itself was completely managed in a bilateral way, there was no dominance from either side." (Hirth)*

The integration process itself was not supported by outside consultants, because the management at Sugen expected that an internal solution and management of the integration process would of course be a little bit slower and somehow more painful, but it would definitely contribute to a more stable structure in the long run.

Communication in order to support the integration process played an important role. Every week a Lunch-Meeting took place where the people of Sugen were informed about the current state of the integration process as well as the negotiations about the exchange ratio of their stocks. Furthermore, executives from Pharmacia made some presentations in order to inform all of Sugen's employees during general meetings. Hirth also introduced some activities to strengthen the common spirit among the people at Sugen. E.g., he brought in external persons who reported over the merger between Sugen and Pharmacia from their point of view or patients using the drugs developed at Sugen.

An overall evaluation of this deal between Sugen and Pharmacia can be found in the following statement:

> *"In the end, I think that it was a good deal for everybody. Such deals are not made between companies, they are made between people. Such deals do not produce innovation, they only serve as growth drivers. The intellectual capital in terms of people emigrates, because it needs its own freedom and wants to earn money. Because of this, one should keep biotech as it is, biotech. Innovations emerge there and not within big pharma. All of this has also an entrepreneurial element, which fosters innovation. With such a deal, know-how can only be acquired." (Hirth)*

3.2.2 Within-case analysis

This section is devoted to the analysis of the case described in the section before, the organizational integration of Sugen into the organizational structure of Pharmacia & Upjohn respectively Pharmacia Corp. – subsequent to the merger between Pharmacia & Upjohn with Monsanto.

The case description identified four major motives which made Pharmacia acquire Sugen: (1) gaining access to Sugen's technology platform, (2) Sugen's interesting pipeline, (3) strengthening of Pharmacia's position in the oncology business, and (4) supporting the growth strategy of Pharmacia. Remembering that a poor period of productivity in R&D was one of the immediate and major reasons for the merger between Pharmacia and Upjohn, it becomes clear that the first two identified motives can also be attributed to this reason. With the acquisition of Sugen, Pharmacia made an important progress in improving its R&D and in filling its Phase I/II gap that characterized the company as Sugen has, on the one hand, a highly innovative technology platform that can deliver a wide range of protein-kinase-based discovery targets and, on the other hand, it allows the immediate access to potential blockbusters. Hence, this acquisition contributes to a short-term improvement of Pharmacia's revenue and earnings situation. The other two motives – strengthening of the oncology business and sustaining Pharmacia's growth strategy – are rather long-term orientated as they focus on the overall strategic alignment of the company. This is also supported by the fact that Pharmacia considers the U.S. market as being the most important pharmaceutical market in the world. Thus, the acquisition of Sugen strengthens its position and presence in this market.

Apart from that, one statement of Göran Ando revealed that such an acquisition can also be regarded as some kind of "external investment" (Madell & Koberstein, 1999, p. 22) in order to gain access to the knowledge and competencies embedded in such biotechnology companies. Hence, this acquisition was part of the overall long-term orientated strategy of Pharmacia and clearly supports the further growth of the company. Considering the acquisition and the subsequent integration process as a simple investment, the question comes up whether this investment pays off or not. From the point of view of Sugen, the dominant motive leading to an acceptance of the takeover bid was the

lack of financial resources in order to bring their clinical trials to an end and the dim financing environment at that time, which made it almost impossible for Sugen to raise money in the stock market.

The analysis of the organizational integration will be done by investigating how the important integration topics of organizational/structural integration, knowledge/competence integration and transfer, cultural integration as well as personnel integration have been realized. The dominant organizational integration strategy was to grant Sugen as much autonomy and independence as possible. This is also reflected in the fact that Sugen kept its name, its headquarter in San Francisco and was also to keep its identity. When having a closer look at the combination of the various organizational elements between the two organizations it becomes better obvious how this general directive has been set up. The overall strategic direction of the group is defined by Pharmacia and is of course also valid for Sugen. Consequently, there can be no real independence in this context. This means in terms of decision-making, that – although a representative of Sugen is part of the team that develops the strategy – the strategic decisions are made by Pharmacia under the supervision of Göran Ando. Once the strategy is defined, Sugen is granted complete freedom in terms of operational decision-making, i.e. during the day-to-day management of the company. Thus, as far as the strategic direction is concerned there is a clear split in the autonomy, on the one hand, and the operational management of the business, on the other hand. Apart from that, the President of Sugen, Peter Hirth, reports directly to the President of Research and Development at Pharmacia, Göran Ando.

The financing and controlling mechanisms as well as some basic information technology were also adjusted according to the requirements of the systems being in place at Pharmacia. The day-to-day collaboration between people from Sugen and Pharmacia was more or less on a project-base in which Pharmacia tried to support Sugen in carrying out its late-stage clinical trials. As the clinical trials had already been far advanced at Sugen, it was decided that they should finish them. After that, Pharmacia was supposed to take over the responsibility for Sales and Marketing, because this is one of the core competencies of a big pharmaceutical company. Such a company has the necessary structure and organization in place in order to push very quickly a newly approved drug to the market. This shows

that Pharmacia has taken over the control and responsibility in that specific moment in which it perceived that it had greater competencies and resources in the respective field than Sugen.

The same logic applies in the area of knowledge and know-how transfer as well. The knowledge transfer was more focused on the know-how of certain genes and targets, and not on the technology platforms themselves. This is also reflected in the fact that the development of certain targets was stopped at Sugen and was transferred to a site of Pharmacia in Italy, which in turn transferred a part of their targets to Sugen. The decision about the transfer was based on the competencies each respective site had. If additional knowledge was needed, it would be provided as well. Apart from that, most of the basic exchange of know-how took place during the work in the different project teams as well as in different meetings or presentations. This process is guided by three important questions raised by Göran Ando: “What do we have in-house? What do we need in-house? What do we need to access but don’t need in-house?” (Madell & Koberstein, 1999, p. 22). Consequently, the knowledge of Sugen can be considered as being part of Pharmacia and, thus, does not need to be transferred completely to any other site. In addition, it is Sugen which has the know-how about these technologies and nobody else in the company. Hence, Sugen can provide the respective knowledge to any business segment or area of Pharmacia, if necessary, and, therefore, it can be considered as being a center of excellence within Pharmacia.

As Pharmacia had undergone several mergers, it was aware of problems that might result out of cultural differences and, thus, paid a lot of attention to it by giving Sugen as much independence as possible. Hence, this cultural gap also explains a big part of the integration strategy applied by Pharmacia. The question is now what makes up this difference and what consequences arise. Besides the fact, that Sugen was a small, dynamic and highly-innovative biotechnology company with a complete different spirit and risk-attitude, there is also one other major aspect to consider. Before the acquisition, Sugen was a company with its own plans and visions. Originally, Sugen was committed to building a vertically integrated oncology business in North America with the objective of bringing to market a family of target-specific signal transduction inhibitors. This company was characterized by a high level of entrepreneurial spirit. It also attracted people

sharing the same goals, vision and spirit being able to identify themselves with the spirit and risks involved. After the acquisition, this vision, spirit and goals changed and Sugen became part of a larger corporation, leading to a fundamental change in its culture. The entrepreneurial spirit which had dominated the company before was no longer necessary. This bears also some consequences as the following statement reveals:

> *"After the acquisition Sugen is part of a bigger 'picture' which it does no longer control itself. This is of course not a bad picture, but it is a quite different one. During the next years, there will be other people joining Sugen. This does not mean that these are 'inferior' people – that is definitely not true, they will just have other characters and qualities than the ones before." (Hirth)*

This statement in combination with the paragraph before allows two major conclusions. First of all, the entrepreneurial spirit that existed in this company disappeared, because it was no longer considered necessary. After the acquisition, other qualifications and requirements play a more important role, because there is a clear shift in the company's focus. The ultimate goal of the company Sugen is no longer to bring a drug to the market – its goal and main strategy, while being an independent company, instead, it is now aiming at doing research and development as part of a big pharmaceutical company while sales and marketing will be carried out by Pharmacia. Therefore, the further emphasis of Sugen will be put on doing good science and identifying promising compounds. Although Pharmacia has been aware of the cultural gap and has decided to preserve the autonomy and independence of Sugen as far as possible, this analysis reveals that this strategy cannot preserve the change in the company's culture as well as the leaving of their entrepreneurial driven top management, which goes along with that.

As already indicated in the paragraph above, the acquisition and the respective changing cultural environment lead to an increasing fluctuation, although Peter Hirth tried to convince as many employees as possible to stay in the company – keeping in mind that a normal annual fluctuation in a Bay Area biotech company is between 15 and 18%. Most of the top management left the company, even Peter Hirth decided to do so after having successfully completed the integration process due to the fact that he is driven by an entrepreneurial spirit striving for

new challenges and the creation of innovation. However, this is a process Pharmacia could not prevent from happening and, to some extent, had also expected. Another issue that made people leave was the missing of stock option programs after the acquisition, since people working at Sugen preferred to receive stock options instead of pension plans. Although Pharmacia has become a U.S. company, in which stock options are much more widespread than in European companies, it did not decide to offer stock options to everybody at Sugen. In order to make people stay they were offered increased salaries as well as interesting profit sharing or bonus programs. In contrast to this, some of the employees also appreciated the advantages Pharmacia could deliver such as job security or much more resources for research. Because of that, scientists were able to continue to do what they have always been doing, namely research – and even much better due to the access to the vast resources of Pharmacia. These people are not that much driven by an entrepreneurial spirit, their motivation rather stems from a spirit of discovery, which is also to become the new major driving force at Sugen. Confronting the reflections of this paragraph and the one before with the motives that Pharmacia made acquire Sugen, one can draw the conclusion that – despite the severe change in the culture and the fact that many employees left – the short-term (improving its R&D gap) as well as the long-term objectives (strengthening the oncology business and the presence in the U.S. market) of Pharmacia could be fulfilled.

Apart from the analysis of the different integration topics, it is also necessary to briefly investigate the organization of the integration process itself. The overall responsibility for the integration process was taken over by Göran Ando, Pharmacia's Executive Vice President & President for Research and Development. Furthermore, the Chairman and CEO of Pharmacia, Fred Hassan, was also involved in the integration process. There can be absolutely no doubt that the very top of the company was responsible for the acquisition and subsequent integration of Sugen. In fact, there could have been no better starting point. The integration process itself was not carried out by a single integration manager, instead by an integration team which was co-headed by Göran Ando and Peter Hirth. This team approach was chosen, because the integration covered nearly all steps of the pharmaceutical value chain with the exemption of Sales and Marketing. The latter steps were to be taken over by Pharmacia after the

respective drug has received its FDA approval. Apart from that, the integration process was managed without external consultants resulting in a slower, but at the same time also more stable integration process. Communication was also considered to be a pillar for the integration process as it was used to strengthen the corporate identity at Sugen and, by this, an attempt to make people stay.

3.3 The case of Merck KGaA – Lexigen Pharmaceuticals Corp.

In this case the organizational integration activities of Merck's acquisition of Boston-based Lexigen Pharmaceuticals Corp. will be described and analyzed. Firstly, a brief corporate profile of the two companies will be presented.[27] Secondly, the emphasis will be put on the integration activities, which is followed by the within-case analysis.

Corporate profiles

The roots of Merck KGaA reach back into the 17th century, when in 1668, Friedrich Jacob Merck purchased the 'Engel-Apotheke' in Darmstadt. In 1827 Heinrich Emanuel Merck started with the large-scale production of alkaloids, followed by plant extracts and many other chemicals. At the end of the 19th century, Merck offered about 10,000 articles, exported in many countries and also founded subsidiaries throughout the world. In 1889, Georg Merck took over the office in New York and established Merck & Co., which started the local production of chemicals in the U.S. ten years later. After World War I, Merck lost many of its foreign affiliates, among them its U.S.-affiliate Merck & Co., which became an independent American company and in the meantime is one of the largest pharmaceutical companies in the world. Both companies agreed that the name 'Merck' is exclusively used in the U.S. and Canada by Merck & Co. and in Europe as well as in the rest of the world by Merck KGaA. In 1999, EMD Pharmaceuticals Inc. was founded by Merck KGaA in order to manage the North American pharmaceutical operations. In 1995, the legal form of Merck – until then managed as an OHG (open partnership) – was transformed into a KGaA (partnership limited by shares). The Merck Group's operating activities are grouped under Merck KGaA, in which E. Merck holding the Merck family's

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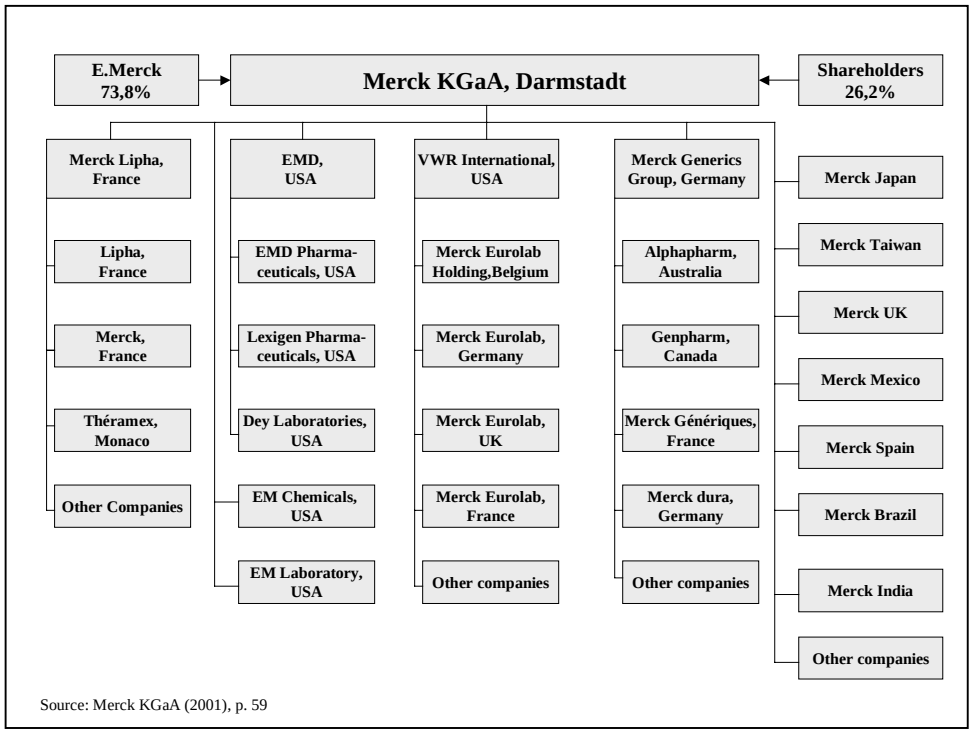
[27] This case study draws on exploratory conversations with Dr. Fred Harms (Project Manager Pharma Project Management Oncology, Merck) and Dr. Sven Rohmann (Head of Pharma Project Management Oncology, Merck) as well as transcribed interviews with two executives from Lexigen Pharmaceuticals Corp., one of them being Dr. Knut Sturmhoefel (Project Manager) and the other interviewee referred to as Anonymous interviewee was granted anonymity. In addition to the two interviews, this case is based on annual reports, public speeches, press releases, the biotechnology information service Recombinant Capital (http://www.recap.com) as well as analysts' reports.

equity interest in Merck KGaA is a general partner with a 74% stake, while the shareholders have a 26% stake in the company.

Today, the Merck Group, still headquartered in Darmstadt, conducts its international business in four business sectors: Pharmaceuticals, Laboratory Products, Laboratory Distribution and Specialty Chemicals with sales of EURO 6.7 billion in 2000. Merck is represented by 209 operating activities in 52 countries and employs 33,000 people worldwide. 52% of its employees work in Europe, 30% in North and Latin America and 18% in Asia, Australia and Africa. In fiscal 2000 Merck reported an operating result of EURO 0.7 billion on sales of EURO 6.7 billion. Europe accounted for 38% on Sales, North and Latin America 45% and Asia, Australia and Africa the remaining 17%. The following Figure 19 provides a simplified overview of Merck's organizational structure.



Source: Merck KGaA (2001), p. 59

Figure 19: Merck's organizational structure

Merck's Pharmaceutical business sector consists of three main business segments: ethicals, generics and consumer health care. In the ethicals segment the different therapeutic areas are: cardiovascular, metabolism/diabetes, women's health, central nervous system and especially cancer/oncology. Following a

strategic review of its pipeline, the group's strategic focus in the pharmaceuticals business sector lays in cardiovascular diseases and metabolism/diabetes.[28] Moreover, Merck aims at gaining a leadership position in the field of oncology and at strengthening its position in the growth market of women's health. The pharmaceuticals business sector invested EURO 453 million in the research and development of new drugs in 2000, which represents 16% of the total sales in this segment, and around 83% of the total R&D expenditures of the Merck Group. Sales in the pharmaceuticals business sector rose by 2% in 2000 to EURO 2,914 million (previous year: EURO 2.8 billion), representing 43% of the Merck Group's total sales.

Lexigen Pharmaceuticals Corp. (formerly Fuji Immuno Pharmaceuticals Corp.) was founded in 1992 by Prof. Susumu Tonegawa, winner of the 1987 Nobel Prize for Medicine, and Harvard Professor Lan Bo Chen. The company is engaged in the development of drugs and genetically engineered products to treat cancer, immune system disorders and other disease. Apart from that, Lexigen develops a broad technology platform that is to lead to new therapies. The company develops certain immunocytokines as cancer treatments, and simultaneously it also works on the immunocytokine concept as a broad, proprietary technology base. Lexigen is developing two particular immunocytokines for the treatment of cancer, both of which are in clinical trials.[29] One is for the treatment of gastrointestinal, pancreatic and prostate cancers and a second for the treatment of small lung cancer and metabolic. Lexigen has developed an active substance, called FP-21399, for use in the treatment of AIDS. Lexigen's anti-AIDS compound inhibits fusion of the virus with its target cell. Moreover, Lexigen is also developing a

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[28] *Glucophage*, the leading drug for oral treatment of type 2 diabetes worldwide, is the star in Merck's drug portfolio. The second major product is *Concor*, a beta-blocker for heart failure.

[29] Immunocytokines are fusion proteins consisting of an antibody attached to a cytokine (Cytokines are general stimulators of the immune system). These molecules combine the specificity of an antibody with the powerful immune-stimulating features of cytokines. Immunocytokines do not cause the side effects of conventional chemotherapy. Most cancer chemotherapy agents kill dividing cells, both normal and cancerous, so that the immune system is damaged. In contrast to this, the immunocytokines work on a completely different principle. They recognize specific molecules found on cancer cells and, by this, avoiding collateral damage to other tissues and organs.

new diagnostic procedure that is capable of identifying cancer cells in the bloodstream with the help of computer-analysis methods. Besides some academic relationships with universities in the Boston area, Lexigen had no industrial collaborations prior to the takeover. Figure 20 summarizes the most important steps of Lexigen's history.

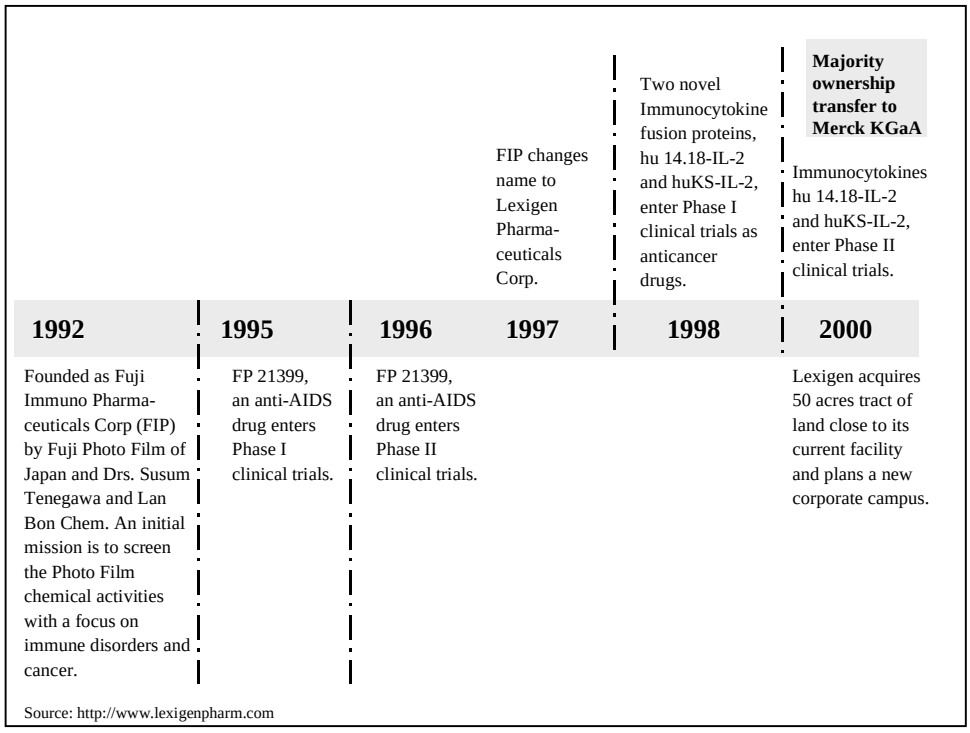

Figure 20: History of Lexigen

3.3.1 Case description

Acquisition process and motives

On December 16th, 1998, Merck announced that it had acquired 57% of Lexigen Pharmaceuticals Corp., located in Lexington, MA. The purchase comprised the exclusive rights of new technologies and important fundamental patents for pharmaceutical research, including a new diagnostic process to identify cancer cells in blood with the help of computer analysis. At that moment, Lexigen had a total of 27 employees on its payroll. Merck did not disclose the purchase price for the shareholding.

The acquisition of Lexigen was carried out because of several reasons. In a *first* step, this acquisition must be regarded from a broader strategic perspective,

which can be best expressed in the words of Hans Joachim Langmann, Member of Merck's Executive Board (Merck KGaA, 2000, p. 4):

> *"The 23% increase in our research expenditure [...] was used to boost the development of new drugs for treating cancer in particular. The same strategy was also behind the acquisition of the U.S. research company Lexigen and the conclusion of key license agreements. We aim to become one of the leading companies in the oncology sector – and we shall to achieve this goal."*

Thus, Merck is striving to become a leader in the area of cancer research in the future and attacks cancer with four completely diverse therapeutic approaches: angiogenesis inhibitors, monoclonal antibodies, immunotherapeutics, and immunocytokines.[30] Besides this general motive, the *second* major motive for the acquisition was that Lexigen had an interesting technology platform in the field of immunocytokines, to which Merck wanted to gain access. With respect to this technology, it needs to be mentioned that Lexigen had two oncology products undergoing Phase I clinical trials at that point in time, and Merck hoped to launch them by 2005 as a potential blockbuster. One of the products is designed for the treatment of gastrointestinal, pancreatic and prostate cancer, and the other one is for the treatment of small cell lung cancer and melanoma. Apart from that, Lexigen also develops a new diagnostic procedure that is able to identify cancer cells in the bloodstream with the help of computer-analysis methods. The *third* major reason was that Merck wanted to strengthen its pharmaceutical position in the U.S., which it considered as one of the most important markets. By this, it also was expected that Lexigen's integration in the Boston research community and its links to renowned research centers would lead to an increase in creativity and innovative capacity.

> *"Lexigen, respectively the President of Lexigen, had a patent issued on a certain technology, the technology of immunocytokines. This was a technology Merck*

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[30] This expansion in the oncology sector is supported by some other acquisitions such as Monaco-based Théramex, a French specialist in hormone therapy, or Biovation Ltd., a biopharmaceutical company located in Aberdeen, Scotland, specialising in antibody and protein engineering technologies. Together, Biovation and Lexigen, represent a world-class research force in the field of immunology and should develop innovative biotherapeutic cancer treatments to patients worldwide.

> *wanted to get a license for, because Merck needed it for its own oncology research. Then it turned out, that Lexigen itself had some financial problems and was even up for sale. At Merck, it was decided to acquire the company with the aim of establishing a pharmaceutical pillar in the U.S., more precisely, in the Boston area." (Sturmhoefel)*

For Lexigen, this acquisition provided the access to vast resources that only can be offered by a big pharmaceutical company. Lexigen desperately needed these resources due to the fact that they were in the middle of clinical Phases I/II requiring a lot of money, that Lexigen did not have. Therefore, the company was on the search for a potential buyer or investor. Because of the fact, that there had already been some preliminary negotiations between Merck and Lexigen concerning a specific patent in the field of immunocytokines, these negotiations finally resulted in the acquisition of Lexigen by Merck.

Organizational integration

As far as the organizational integration is concerned a distinction between the originally intended plan and the finally resulted structure must be made, as the structure of Merck's pharmaceutical business itself changed only a few months after the acquisition. Thus, the description of the organizational integration and the different organizational elements mainly focuses on the structure which was finally set in place, using the original plans – as they never have been carried out – only as a reference point if necessary. This overall situation, which also reveals some problems, is referred to by an executive of Lexigen as follows:

> *"In reality, there is not a very good definition of what the responsibilities and structure are, or how the interaction should be. It is about two years since the acquisition of Lexigen by Merck and more than one and a half since the creation of EMD. And yet, there is still a lot of time and effort being spent on defining what the roles are, and what the responsibilities will be." (Anonymous interviewee)*

In the context of the original plan, Lexigen was to cover nearly the whole pharmaceutical value chain including basic R&D as well as clinical development and marketing. In addition, the company should also retain a lot of autonomy, as the following quotation indicates:

> *"When the small company was first acquired there was a very clear statement from the CEO of Merck that the small company should retain some of the attributes that make it small, dynamic and very fast. That these, by themselves, are assets to Merck and that they should not become the same operating procedures as Merck. The same day that this comment was made, we begun to receive instructions from other divisions within Merck how we should operate to be like Merck. [...] So, it continues to be expectations within Merck that we will do things in conformity as it is done in Merck, but also expectations that we operate with a high level of independence and some level of separateness." (Anonymous interviewee)*

This first decision did not last very long, in fact, it was never really implemented, because half a year later Merck announced a reorganization of its pharmaceutical business with a special focus on its presence in the U.S. Thus, the further organizational integration must be described with keeping this reorganization in mind. This reorganization changed the role that was to be attributed to Lexigen in a fundamental way. Merck had set up a separate company to focus on growth in its pharma business in the U.S. EMD Pharmaceuticals, Inc., located in Durham, N.C., serves now as the new North American Headquarter for the Merck Pharma Division and, as of June 1, 1999, Matthew Emmens has been named President and CEO of the newly created company. The new headquarter, located near Research Triangle Park, has the task of creating meaningful relationships with researchers at important centers of influence and of coordinating the North American drug development, marketing and sales activities, including Lexigen. To enhance the organizational effectiveness, the management structure of the Pharma Division was streamlined and the number of board members was reduced. Knut Sturmhoefel comments on this reorganization:

> *"It was decided that most of the biologic research is to be with Lexigen. Their main responsibility lays in the biologic research, especially everything that has to do with proteins. It can be seen as a center of excellence. From that point of view it was not a bad decision to separate research from clinical development. If a local separation really was necessary or not, I don't know. However, the separation and to say, that Lexigen should do this, what it can best, was an appropriate decision. But, it wasn't the original intention at the beginning. And this reorganization has created quite a stir."*

Thus, at this specific moment – with the creation of EMD as the new North American Headquarter for the Merck Pharma Division – the role of Lexigen has been redefined. From then on, Lexigen has been considered as being one of Merck's key research facilities as well as an entry-point into the U.S. pharmaceutical market and the Boston scientific community. Henceforth, Lexigen is viewed as Merck's worldwide center of excellence for biological entities. Lexigen is to generate drug candidates through its research, while EMD provides the development and commercialization expertise and Merck supplies its global presence and management capabilities. Now, the role of Lexigen lays on the basic research and on acting as some 'kind of supplier':

> *"At the beginning, everything was supposed to be in the hands of Lexigen including clinical development. Now, one can rather call it a 'desintegration'. Lexigen is an important research facility for Merck, one of the most important suppliers for the biotech platforms. The research unit Lexigen will only play a supportive role for the clinical development of the projects, which will be done at Durham." (Sturmhoefel)*

From a strategic point of view, only the President of Lexigen, Stephen Gillies, is involved in the process of clinical development, because he is also VP for Research at EMD, and, by this, participates in the respective strategy meetings. Lexigen itself is 'only' a research unit and, thus, is not really involved in the overall strategy-making process. However, as far as their research activities are concerned, Lexigen has a high degree of autonomy with its own research budget. They only have to undergo a general review process and have to fulfill certain objectives, but carry out their research completely on their own.

> *"People at Lexigen are part of the worldwide research team at Merck. Lexigen itself – besides Stephen Gillies – is not part of the strategy-making process. A decision has been made, that EMD will take over that part and coordinate the further development." (Sturmhoefel)*

In terms of reporting and controlling systems Lexigen has no responsibility at all, because everything is centrally managed by EMD. Lexigen only disposes over the research budget, which is also granted via certain mechanism by EMD.

> *"As far as reporting and controlling is concerned, everything is managed by EMD. Lexigen receives its money from EMD over certain mechanism. Lexigen is now part of EMD and doesn't belong directly to Merck any longer. At Lexigen, there are no controlling or reporting structures in place. A company like Lexigen which has started with 15 people has not the necessary departments in order to handle 80 people. Lexigen has its own research budget and its own President, and that's it." (Sturmhoefel)*

As far as the general collaboration between Lexigen and Merck is concerned, there is really a wide gap between both sides' expectations. Lexigen wants to continue to work efficiently as it has done before, which means working with very little expenditures but at high risk. In contrast to this, Merck wants to make everything as secure as possible, which has led to some delays in terms of decision-making. Although Merck provides the necessary know-how and resources for the further steps of the development process, this obvious contradiction has already caused severe problems from the point of view of Lexigen as the following quotation reveals:

> *"Biotech is not operating by being conservative. Biotech operates by taking risks, by being dynamic, by moving very quickly, by trying different ideas on a trial base. If it works, you continue. If it doesn't work, you try something else. In the movement it is very, very quick. The expectations for the development of ideas, the development of products have both gone faster than the operational tempo of a large corporation or the operational tempo of a large conservative corporation." (Anonymous interviewee)*

This shows, that the day-to-day business of the biotech company changed completely. This implies one important advantage, but at the same time also a very severe drawback for the future management of such a company. On the one hand, the company has more resources than ever before, but, on the other hand, there is a clear change in the way of doing business:

> *"Well, for a small biotech company to fail to achieve a goal for two years means the death of the company. In the structure of a big company that is not true, it is acceptable to continue to fail this goal, because it is just not a small biotech company anymore, it is also part of a large corporation. There is money to support. So, the effect having the structure behind it allows the failure to take place, that could not take place when we are on our own. [...] This is good and*

> *bad. On the one hand, it allows time which is necessary to develop ideas, but, on the other hand, it also allows us to take a slower operational tempo and not to accomplish goals that would otherwise have been done. That is not necessarily a benefit." (Anonymous interviewee)*

At the beginning, the responsibility for Lexigen laid in the hands of the oncology business area team, especially in the hands of its head Klaus Hoenneknoevel. In addition to that, the decision to acquire Lexigen was also fostered by this area. The reorganization of the Phama Division had been decided at the top of the company and not by the oncology area. Apart from that, this reorganization resulted in a change of responsibility for Lexigen, because the company was put under the responsibility of EMD in Durham. Hence, the reporting structure is that the President of Lexigen, Stephen Gillies, reports directly to the President and CEO of EMD, Matthew Emmens, who reports directly to the Chairman of Merck's Executive Board in Darmstadt, Bernhard Scheuble. This is the ultimate structure which has been set in place, but also provoked some discontent at Lexigen, because "in that case, you have three different visions of how one area – the oncology area – should work and within the space of one and a half years there are three different major structural changes" (Anonymous interviewee).

With regard to a possible transfer of knowledge or a specific technology from Lexigen to Merck it can be said that there was no real transfer, because the biotech expertise is at Lexigen. Instead, some of the projects in the field of biologics at Merck were stopped and were transferred to Lexigen:

> *"Most of the biotech-expertise is at Lexigen. Part of it has also been transferred, i.e. the things that have been done at Merck were reduced and transferred to Lexigen. Merck decided to focus on small-molecules whereas Lexigen is supposed to be responsible for biologics. [...] The immunocytokines are a pilot project, they have been developed here and the know-how is also here." (Sturmhoefel)*

From a cultural point of view different levels must be distinguished. In a first step, there is a difference in terms of country cultures between the U.S. and Germany which is reflected in different ways of working:

> *"In the U.S. – irrespective of what industry – you think much more in a matrix structure and work together in a team neglecting the lines than you do in*

> *Germany. In Germany, the matrix-structure is well known, but it is the line function which gives the directives and defines roles and responsibilities. [...] Interactive communication and collaboration as a team is very difficult in such a surrounding where the line function is dominant. It took me a lot of time and effort to get the team members – who were really top-people in their respective field – effectively to work together. But in the end, it worked out quite well." (Sturmhoefel)*

Apart from this general difference, people also expected problems resulting from the fact that big pharma needs to collaborate with small biotech which is reflected in different statements made such as 'Oh, now we have to cope with the Germans and big pharma' from the Lexigen part and 'Those at Lexigen have no clue about what it really means to develop a medicament' from the Merck-part. They had different approaches of doing business. If Lexigen had remained independent, it would have pursued the strategy of developing a medicament and then building up the corresponding organization. In contrast to this biotech strategy, Merck takes its big pharma approach consisting of first building the respective structure and organization and then developing the product. This is what one of the executives at Lexigen leads to the conclusion that "because of the corporate structure and culture within Merck there is an inability to make decisions" (Anonymous interviewee).

At the moment of the acquisition, Lexigen had 27 employees of whom nobody left after the deal was done. There are several reasons for that. Lexigen itself was mainly dominated by one person, its President and owner of the major patents, Stephen Gillies. The whole organization was more or less tailor-made for him and he had everything under control. For the people at Lexigen nothing really changed after the acquisition, because Lexigen had been granted autonomy in the field of research with Stephen Gillies remaining in charge of everything at Lexigen. By this, he also remained their boss and only contact person. Apart from the fact that the few other important persons were contractually bound, the overall situation for the company became better as they had now access to resources they never had before. Thus, they continued to do what they had always been doing, research.

> *"Stephen Gillies continued to be their boss. They did not care about the integration, because they were not affected. Only those involved in the*

development project, about four-five people, were affected, but they were bound by contract." (Sturmhoefel)

Organization of the integration process

The organization of the integration process is not that simple and straightforward as it is in some of the other cases. The main reason for this lays in the fact that there was some kind of integration process immediately after the acquisition. However, because of the reorganization decision of Merck's Pharma Division this integration never became really effective. Thus, the following description tries to combine both approaches by comparing some of the immediate actions with the decisions made and set up afterwards.

The original integration was a relatively short process, due to only 27 people at Lexigen being involved. A merger team was created under the direction of Klaus Hoenneknoewel, head of the oncology business area team, consisting of four people from Darmstadt from the oncology area and four people from Lexigen. This team carried out the integration by bringing the people in the different areas together and preparing the collaboration. Most of the integration was to be done on a day-to-day-working relationship. In this context, Knut Sturmhoefel had to take over a leading role. He served as some kind of integration and interface manager between Lexigen and Merck, in a first step, as well as between Lexigen and EMD in a second step. His special role becomes obvious if it is taken into account that he is a German scientist, having worked in the U.S. and employed by Lexigen on behalf of the recommendation of the headquarter in Darmstadt. Irrespective of what point in the integration, respectively the reorganization process, is considered his task is getting the people to work together in teams. By this, he has to ensure the exchange of the relevant skills and knowledge.

Apart from that, there was no real transfer of employees of both sides during the integration process. No executive from Darmstadt was sent to Lexigen in order to make them familiar with the systems and structure in place, because with the creation of EMD a new structure was created changing also the role and expectations with regard to Lexigen. This decision was not made (and also not really supported) by the oncology business area team, but made by the Executive

Board of the company. In the words of an executive at Lexigen this situation is perceived as follows:

> *"I do know that there has been a series of indecisive events as well as some decisions that are made were short-lived. So, a particular vision is defined, is discussed. The vision is made, we pursue that vision and then a few months later it changes. And a few months after that it changes again. And a few months later it changes again, which of course prevents effective integration. [...] And I think that within the different companies people are finding it difficult, because they don't know what their sphere of operations is and how it is related to the others. So, the goal at the individual level, at the group level within the company here, within the company EMD, these goals for those personnel may change all of a sudden." (Anonymous interviewee)*

This quotation reveals that people at Lexigen were not content with the decisions made at the top of the group. Moreover, it also shows one of the major lessons Merck experienced concerning this acquisition and especially the subsequent integration process. Decisions must be made as quickly and as clearly as possible in order to prevent insecurity at the individual level. Moreover, there was also no clear communication about these issues which again fostered the feeling of insecurity. Another problem was the different perception in how to run the business. While the big pharmaceutical companies prefer the 'big strategy', which implies first to establish the necessary organization and then to develop the product, the small biotech companies does it vice versa. Hence, it is absolutely necessary to ensure a smooth transition from the early phases of the development process which had already been carried out at Lexigen to the later ones which were subsequently under the control of Merck. In the deal between Merck and Lexigen this was not really done effectively.

> *"The first integration process was carried out quickly. [...] O.k., a few experts were missing, which were neither at Merck nor at Lexigen and the responsibility for them was also not well defined. That was a mistake, but the integration process itself has been initiated as quickly as possible and could also have been running that way, if there had not been the creation of EMD. But in the end, that is another story – which of course clearly affects the integration of Lexigen and needs to be taken into account. Hence, it is difficult to say, whether the original plan would have been successful or not." (Sturmhoefel)*

3.3.2 Within-case analysis

This section now focuses on analyzing the integration story between Merck and Lexigen, depicted in the section before, and tries to make some concluding remarks as some kind of intermission towards theory building from case study research. The specialty of this case lays in the fact that the original integration plans had never really been put into action, but were replaced by a major reorganization within Merck a few months after the acquisition.

In this analysis, the first thing to point out is the question of which motives led to the acquisition of Lexigen. As the case description revealed, Merck had the intention to foster its position in the oncology sector and to strengthen its presence in the U.S. pharmaceutical market by gaining access to the Boston research community. From this, the first major motive can be derived by concluding that the acquisition of Lexigen contributes to the long-run strategic objectives of Merck. Apart from that, Lexigen had a very interesting technology platform and also two oncology products undergoing clinical trials with a promising sales potential, perhaps even the chance of becoming a blockbuster and, by this, having a substantial positive impact on operational results. Furthermore, Merck needed the patent of the immunocytokines in order to be allowed to continue the work on its own research. Putting this all together, the second major motive is definitely more short-term orientated. In contrast to this, Lexigen accepted the takeover bid, because it desperately needed money in order to push its clinical trials and also got access to the resources provided by a big pharmaceutical company.

While analyzing the organizational integration along with the different integration elements of organizational/structural integration, knowledge/ competence integration and transfer as well as cultural and personnel integration, it is necessary to keep in mind the identified two major motives, because they explain an important part of the integration and also the decision for the subsequent reorganization. As far as this case is concerned, it is very difficult to say whether there are two basic organizational integration strategies or whether it is one organizational integration strategy at two different levels. In the original plan of the oncology business area team, it was intended that Lexigen should retain a very high degree of autonomy in nearly all steps of the pharmaceutical

value chain. This means that Lexigen was to take over responsibility for R&D, clinical development as well as sales and marketing in the U.S. In fact, it is almost impossible to be granted more autonomy and responsibility.

In this context, two things are very important to notice: (1) the focus at Lexigen was only on oncology, and (2) Lexigen was a small biotechnology company with only 27 employees at that time and had absolutely no experience with clinical development or how to run a bigger pharmaceutical business. From this, the rationale for the reorganization decision is quite easy to understand. The crucial question for Merck's Executive Board was whether the company Lexigen – given its specific situation – would be able to ensure the long-run objective of strengthening the U.S. position of Merck in the whole pharmaceutical business segment, not only oncology, or not. The Executive Board obviously answered this question with 'no' and decided to set up a separate company, EMD Pharmaceuticals. After that decision, Lexigen was considered as playing the role of a center of excellence for biological entities with the aim of doing basic research and generating promising drug candidates. These drug candidates are then developed and commercialized by EMD in the U.S. with Merck supplying global presence, management capabilities and support. By establishing this structure, the Board at Darmstadt hoped to better contribute to the long-term objective of Merck's presence in the U.S.

What does this mean for the overall organizational integration strategy? The organizational integration strategy must be considered in close connection with the respective degree of autonomy granted. In fact, there has been a split or, in other words, a clear cut concerning the separation of research from development and commercialization. As far as the basic research and the generation of potential drug candidates were concerned, Lexigen is still granted the maximum degree of autonomy and is in full charge of that part. This is also reflected in the fact that the President of Lexigen is at the same time Vice President (VP) at EMD and responsible for the U.S.-wide research. After some promising drug candidates have been identified, it is EMD which takes over the responsibility for the further development and commercialization of the product, while Lexigen is completely left out of this process. Therefore, it is possible to draw the conclusion that the responsibility differs depending on what step of the pharmaceutical value chain the focus lays. During the early stages of research the

overall responsibility going along with a high degree of autonomy is at Lexigen. However, as soon as the promising drug candidate is identified – which represents a progress when having the pharmaceutical value chain as a reference point – the responsibility is no longer at Lexigen, but taken over completely by EMD. Lexigen only delivers some support, if necessary. From this it follows, that the current projects which are in clinical trials are now managed by EMD at Durham, and, therefore, the second major motive of the acquisition will be realized in accordance with the overall strategic direction.

In terms of strategy-making as well as reporting and budgeting, the decisions are made at EMD in agreement with Merck. Lexigen itself does not even have the respective departments. In these processes Lexigen is only involved to the extent in which Stephen Gillies in his function as VP for research at EMD – but not primarily as President of Lexigen – is part of. Furthermore, everything that has to do with reporting, controlling and human resources issues is managed by EMD at Durham for Lexigen.

With regard to a possible knowledge transfer it must be stated that there was simply no transfer of knowledge from Lexigen to Merck. Instead, projects at Merck with a clear link to biologics and proteins had been reduced and were transferred to Lexigen. Lexigen was considered as being the center of excellence within Merck for everything that has to do with biologics because “they had people who had much more experience and knowledge in the field of proteins than the people at Merck” (Sturmhoefel). Thus, it was a question of who is the best in this field and disposes over the necessary knowledge, know-how and competencies within the company. It was decided that it is Lexigen which has this position. This decision makes also perfectly sense, because it reflects one of the motives for the acquisition, the specific know-how and technology, which Lexigen can provide. Another question which comes up now is, how the people at Durham get the necessary knowledge to carry out the clinical development of the promising drug candidates. The answer to that question results of the reorganization process and has nothing to do with the originally intended plans. It is now the task of Knut Sturmhoefel whose role changed over time. At the beginning he was more an integration manager, whereas after the reorganization he took over the role of an interface manager, being responsible for the transfer of the knowledge needed at Durham. Apart from that, Stephen Gillies, the holder

of the major patents will also support the further development activities at EMD. In addition, the so-called 'Translation Research Teams' will be introduced in order to support the development at Durharm.

The cultural analysis can be subdivided in two different dimensions. Firstly, there is the obvious cultural gap on a country level between U.S.-based Lexigen and the German company Merck. In this context, some problems arose due to the different kind of thinking in terms of command and control structures. In the U.S., the matrix-structure and teamwork across different line functions is the dominant structure, whereas in Germany the matrix structure also exists, but it is the line function which is in control of everything. This contradiction resulted in a few coordination and communication problems. After having detected and becoming aware of these problems they had been quickly solved due to the interference of Knut Sturmhoefel.

Secondly, there is a much wider gap between the structure and thinking of big pharma, like Merck, and the way business is done at a small biotechnology company, like Lexigen. Big pharmaceutical companies always try to avoid risk as much as possible or, at least, to reduce it as far as possible. This thinking also reflects the approach in which Merck tackles a project or the development of a drug, because it first builds-up the necessary structure and organization covering the whole value chain and, after that, focuses on the development of the product. However, small biotech, in this case Lexigen, would do it vice versa by first developing the product and then establishing the necessary organization. One of the important reasons why they would do it that way is the fact that a small biotechnology company does not have the necessary resources to build-up such a structure before having a potential revenue generator. In fact, it is a completely different approach which implies some severe consequences. Lexigen as a part of Merck is no longer the fast acting, highly-dynamic and high-risk taking small biotechnology company. It is now part of a much bigger entity that acts according to totally different rules. Having this in mind employees' complaints at Lexigen about the fact that "it is the expectation of a large corporation that the small company operates like them" (Anonymous interviewee) can be easily understood, because this company is no longer regarded as being a small, independent company. Its role within Merck needs to be newly defined. Of course, this should not take that much time as it took in this case – more than two years –, but it

definitely takes much more time than the decisions made in an independent small biotechnology company.

Besides these problems that come up due to the cultural gap between big pharma, Merck, and small biotech, Lexigen, there are also some clear advantages for both sides that go along with that liaison. On the one hand, Lexigen gets the money it definitely needs in order to continue its research and to push the products through clinical trials. This is now done with the help of Merck, as Lexigen itself never went through regulatory approval before. On the other hand, Merck gets access to new technologies and some promising drug candidates. The question now is, how do these two organizations get along with each other in order to get the best out of the deal. The decisions for the realization of these advantages are made at Merck and not at Lexigen. The reorganization of Merck's pharma business segment resulted in the definition of Lexigen's role as a center of excellence for research within Merck. Thus, Lexigen is expected to do basic research and to generate promising drug candidates which then will be developed by EMD.

Hence, this reorganization has an effect on the way Lexigen sees itself, and it takes some time until such a change in mind is accepted. Trying to define this role change a little bit more precisely, one can draw the conclusion that Lexigen is no longer supposed to act in the same entrepreneurial way as it did before the acquisition as an independent company in the sense that it needs to develop a product, push it through clinical trials, bring it to the market, and generate revenues. Provided that Merck had not taken over Lexigen, this would have been necessary. However, after the acquisition Lexigen is expected to do basic research and generate promising drug candidates. Because of these expectations, Lexigen rather needs a spirit of discovery than an entrepreneurial spirit. Accepting this argumentation and the fact that somehow the cultural gap between Merck and Lexigen becomes smaller, it is possible go one step further and conclude that in this case Lexigen – because its activities are reduced to the research field and do no longer cover the rest of the pharmaceutical value chain – loses some of its former identity. This brings it closer to Merck and, in turn, brings Merck closer to the fulfillment of the goals it had in mind with the acquisition of Lexigen and the subsequent reorganization of its pharma business segment.

Due to the fact that Lexigen had only 27 employees at the time of the takeover and it was not listed at any stock exchange, which implied that stock option programs did not exist, the analysis of the personnel integration issues is relatively short and straightforward. After the acquisition nobody left the company, because for most people in research nothing changed as they kept their boss Stephen Gillies, and they could continue to do what they had always been doing. Moreover, they even had better access to vast resources provided by Merck. The top scientists were bound by specific contracts. Relocation problems as well as special incentives for the loss of stock options did not occur in this deal.

After the analysis of the different integration topics, the analysis of the organization of the integration process needs to be taken into account. In this context, it is again necessary to point out that this integration process cannot be separated from the subsequent reorganization process. Thus, both dimensions are covered in this analysis. To start with, the case description reveals one major problem in terms of responsibility. The acquisition and the early integration efforts were fostered and carried out by the oncology business area team. At the beginning, this team was also in charge of Lexigen. However, the subsequent reorganization decision of the Pharma Division was made at the very top of the company – and not at the oncology business segment level. This reorganization led to a change in responsibility for Lexigen, because the responsibility was taken away from the oncology business area team and transferred to EMD. This makes clear that the original plans of the oncology business area team did not have the full support from the Executive Board. This change in responsibility is one of the major reasons why the final integration of Lexigen following the reorganization decision took so much time and created uncertainty among Lexigen's employees. This uncertainty is reflected in the following statement:

> *"Even though, the problem can be solved, if someone is willing to craft a vision, having the support of Top-Management within Merck, make decisions around creating that vision and then implementing those decisions from the top down." (Anonymous interviewee)*

This statement reveals, on the one hand, the discontent of the people at Lexigen with the delay in decision-making and, on the other hand, points out where one of

the major problems was. It was the missing support from the top of the group that partly made occur these problems. Most of the resulting problems are a consequence out of this undecidedness. E.g., the original integration efforts of the first merger team under the direction of Klaus Hoenneknoewel, head of the oncology business area team, never became really effective.

Additionally, the role of Knut Sturmhoefel also changed over time. At the beginning, he could rather be considered as being part of the integration team in the role of an integration manager, and after the reorganization, he is rather a kind of interface manager ensuring the translation of knowledge between the different sites or, in other terms, between the research done by/at Lexigen and the development carried out by/at EMD. The first integration process itself was carried out rather quickly, but the subsequent reorganization which implied some kind of ‘reintegration’ took much longer and was not communicated clearly.

3.4 The case of Novartis AG – SyStemix, Inc./Genetic Therapy, Inc.

The objective of this case is to describe the post-acquisition integration activities of SyStemix, Inc., and Genetic Therapy, Inc., in the following referred to as GTI, into the organizational structure of Novartis. Firstly, a brief general corporate profile of Novartis as well as of SyStemix and of GTI will be presented. Secondly, the case will focus on the integration activities of the latter two companies into the structure of Novartis.[31] Finally there will be the within-case analysis.

Corporate profiles

Novartis AG was created by the merger of Sandoz AG and Ciba-Geigy AG in December 1996 in a deal worth $30 billion.[32] Prior to the merger, Sandoz AG and Ciba-Geigy AG were both global participants in the pharmaceutical and agrochemical industries. At the time of the merger, they were both health companies with some market-leading products, including Sandoz's *Sandimmune* and *Neoral* for organ transplants and Ciba's *Clorazil* for schizophrenia. The predecessor companies merged in order to realize sales, cost and cross-sector synergies, and in order to create a combined entity with the resources and abilities to compete in the long run in an increasingly competitive environment. In addition to a new name,[33] Novartis' management spun off the $7 billion specialty chemicals business that had given birth to Sandoz, Ciba and Geigy. Thus,

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[31] This case study draws on one preliminary discussion with an executive from Novartis as well as on two transcribed interviews with executives from Novartis who have been active on both sides, the pharma and biotech one. Because of the huge amount of money lost in connection with the acquisition and integration of SyStemix and GTI, the persons interviewed were granted anonymity. Apart from that, this case is based on annual reports, public speeches, SEC Filings, press releases by all companies named herein, the biotechnology information service Recombinant Capital (http://www.recap.com) as well as analysts' reports.

[32] On May 8, 2001, Novartis announced that it had acquired 20% of the pharmaceutical giant Roche's voting shares for $2.8 billion. This move is considered as being a prelude to the creation of the world's second largest drug company by a merger between Switzerland's two leading drug groups.

[33] The name 'Novartis' is derived from the Latin *novae artes*, meaning 'new skills', which is to reflect the Group's focus on research and development.

Novartis would not only be bigger, but also more focused on life sciences. Before the merger, both companies had created a network of partnerships with small biotechnology companies to augment their internal research efforts. Ciba-Geigy had mostly minority equity positions in its partners and refrained from active management, e.g. as it is the case with Chiron Corporation of Emeryville, CA, in which Ciba-Geigy acquired 49.9% ownership for $2.1 billion in November 1994[34]. In contrast to this, Sandoz had typically taken larger stakes, often involving board seats, and had, in several cases, subsequently acquired the company.

Headquartered in Basel, Switzerland, Novartis employs over 67,000 people worldwide, operates in over 140 countries and has been listed on the Swiss Stock Exchange as well as on the New York Stock Exchange with American Depositary Shares since May 11, 2000. Thus, 43% of the company's employees work in Europe, 40% in North and Latin America, and 17% in Asia, Australia and Africa. Novartis operates in five principal industry sectors: pharmaceuticals, generics, eyecare products and medicines ('CIBA Vision'), consumer health and animal health. The operation in a sixth industry sector, agribusiness, was spun off and merged with Zeneca Agrochemicals to create Syngenta in November 2000.[35] In fiscal 2000 Novartis reported a net income of CHF 7.2 billion on sales of CHF 35.8 billion. North and Latin America accounted for 50% of sales, Europe for 33% and Asia, Australia and Africa for the remaining 17%. The group's overall strategic priorities lay in focusing on healthcare with pharmaceuticals at its core, establishing mega brands, supporting innovation, attracting and retaining talented people and strengthening the U.S. presence.

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[34] In the deal between Ciba-Geigy and Chiron, Ciba-Geigy was granted as a minority shareholder, a so-called 'first-rider-refusal', which permits Ciba a preferred access to any of Chiron's research findings, if Chiron does not want to develop and market them on its own.

[35] On December 2, 1999, the Boards of Novartis and AstraZeneca announced that they both agreed to spin off and merge Novartis' Crop Protection and Seeds businesses and Zeneca Agrochemicals to create the world's first dedicated agribusiness company with pro forma combined sales in 1998 of approximately $7.9 billion. The new company will be named Syngenta AG. This as well as the already mentioned separation of the agribusiness at Pharmacia or the sale of Aventis Crop Science are the first indications that companies are no longer strive to realize the integrated Life-Sciences-Strategy. Instead, companies like Novartis will concentrate their future efforts on their healthcare business.

Novartis Pharmaceuticals, which is responsible for the activities in the gene therapy sector is a world leader in discovering, developing, manufacturing and in marketing prescriptive medicines. The goal of Novartis Pharmaceuticals is to provide a broad portfolio of effective and safe products and services to patients around the world.[36] This goal is supported by a global organization, operating in more than 140 countries. In 2000, Novartis Pharmaceuticals employed over 37,000 people and had CHF 17.6 billion in sales, which represented 49% of the Group's sales, and reported an operating income of CHF 5.4 billion. In 2000, the sector invested approximately CHF 3.2 billion in R&D, which represents 18,2% of total pharmaceutical sales. Novartis Pharmaceuticals has also entered into long-term research agreements with various institutions totalling CHF 1.6 billion. The product portfolio includes a wide range of products in seven major disease areas: cardiovascular/metabolism/endocrinology, central nervous system, dermatology, oncology/hematology, respiratory, rheumatical/bone/hormone replacement therapy and transplantation/immunology. In July 2000, Novartis announced a new organizational structure for its pharmaceutical operation, designed to serve specific customer groups. The new groups – primary care, specialty business and mature products – create focused and entrepreneurial business units, integrating all business functions. The primary-care unit focuses on the launches of new, potential blockbuster brands. The specialty business consists of three separate units: oncology, transplantation, and ophthalmics. The mature product unit will have the key responsibility for optimizing the economic value of older products, using new models to optimize their sales potential. The managers of the newly created business units report directly to the new global head of pharmaceuticals, Thomas Ebeling. Their task is to access cutting-edge technologies and novel compounds, to accelerate product development, and successfully launch new products on a global basis. This new organizational structure is to increase ownership, accountability, and speed, while at the same time retaining the advantages of economies of scale in basic technologies, skills, and knowledge, as well as in production.

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[36] Besides the two top-products in 2000, *Sandimmun/Neoral* (transplantation) and *Voltaren* (inflamation), the five key growth drivers of Novartis Pharmaceuticals are *Diovan* (hypertension), *Lotrel* (hypertension), *Lamisil* (fugal infections), *Miacalcic* (osteoporosis), and *Exelon* (Alzheimer's disease).

Genetic Therapy, Inc. (GTI), based in Gaithersburg, MD, is a leader in the development of human gene therapy products for the treatment of genetic and acquired diseases. GTI is a pioneer in the development of vector technology. Using this novel approach, based on extensive, innovative basic vector research, genes are inserted into cells to produce therapeutic proteins in the body. Founded in 1986, GTI represents one of the largest group of scientists dedicated to research and development in this field. The company's product development programs include cancers, hemophilia, and gaucher disease. The total amount of capital raised by venture capitalists, public offerings and private placements before the final acquisition by Novartis in July 1995 was about $700 million. Besides collaborations with different universities like Harvard or the University of Texas, GTI had collaborative agreements with Bristol-Myers Squibb, StemCells, Alexion, Advanced Therapies, and Human Genome Sciences.

Since its inception in 1986, GTI has been a global leader in the development of novel gene therapy products for the treatment of debilitating and potentially life-threatening genetic and acquired diseases. GTI's research is directed at basic vector research and the development of novel potential products. Before the acquisition by Novartis, the company had just started with Phase III clinical trials for brain cancer. The tradename for this was called GLI-328. Besides this, GTI was undergoing clinical Phases I/II for breast cancer, gaucher disease and fanconi anemia.

SyStemix, Inc., founded in 1988 and based in Palo Alto, CA, is (was) a biotechnology company leading in the development of therapies for major disorders of the blood and immune system based on the use of its patented, isolated, expanded and gene-modified human hematopoietic stem cells.[37] Besides the different investments made by Novartis, SyStemix only raised $64 million of venture capital and $240 million by going public. Because Novartis had already acquired 60% of SyStemix in 1992, the company had no major relationships with

[37] The hematopoietic stem cell is the only hematopoietic cell which is pluripotent, capable of differentiating into all types of blood an immune cells, and capable of self-renewal. Many existing cancer therapies, such as chemotherapy and radiotherapy, compromise the body's immune system and its ability to create new cells. By reinfusing hematopoietic stem cells after these therapies, it is expected that patients will achieve timely recovery as well as sustained hematopoietic function over the long term.

other industrial partners. They had only collaborations with universities like e.g. Stanford. SyStemix is targeting on diseases, such as cancer and AIDS, combining sophisticated cell biology with advanced molecular biology techniques (genetic manipulation), as well as device and process technologies to develop novel healthcare products. In addition to the important and patented hematopoietic stem cell, SyStemix has developed a high speed cell sorting system that separates viable and functional hematopoietic stem cells at higher speeds and levels of purity than cell doses obtained with a number of other cell separation methods. By this, the company is able to effectively eliminate certain types of tumor cells, providing a cell population that is disease-free.

SyStemix initiated its first Phase I/II clinical trial of hematopoietic stem cell transplants to support multiple myeloma patients undergoing chemotherapy in June 1995. This study was terminated in July 1996 due to concerns related to cell viability associated with procedures used for handling and storage of cells at the clinical site. In March 1996, SyStemix initiated its first European Phase I/II human clinical trials in cancer. In September 1996, additional clinical trials in cellular therapies for breast cancer and indolent non-Hodgkin's lymphoma were initiated. Although these human clinical trials had been initiated, full commercialization of its R&D programs would not have occurred for several years. Furthermore, in October 1996, SyStemix filed an investigational new drug application for cell-based gene therapy for the treatment of HIV.

3.4.1 Case description

Before starting with the case description, it is necessary to mention that this case – compared with the other cases – has a certain specialty. This case is about two acquisitions by one company in a complementing technological field, Novartis' acquisition of SyStemix and Genetic Therapy (GTI), both involved in gene therapy, which finally were consolidated under one roof. The case description as well as the subsequent within-case analysis following this section, however, lays on the integration and collaboration activities subsequent to each respective acquisition and not on the analysis of the consolidation process between SyStemix and GTI. However, the consolidation process is also referred to in order to add a further perspective when making a useful contribution and to give

the appropriate, overall picture of these two cases. Apart from that, one must be aware of the fact that the initial steps of the acquisition have already been carried out by Sandoz before the formation of Novartis. Hence, the point of view of the acquirer is either represented by using the name ‘Sandoz’ or afterwards ‘Novartis’ which are used synonymously. Moreover, it is worth mentioning that by the end of the year 2000 SyStemix, Inc., ceased to exist and was finally shut down.

Acquisition process and motives

The acquisition of SyStemix was carried out in several steps. On February 19, 1992, Sandoz acquired a 60% interest in SyStemix and paid a total of $625 million for the company, which specializes in cellular therapy. Besides this acquisition, in April 1993, SyStemix and Sandoz formed an equally owned joint venture, named Progenesys, to research and develop hematopoietic cell-based, somatic gene therapies against HIV infection. This joint venture was dissolved in August 1995 and replaced by the HIV Gene Therapy Collaboration. On January 30, 1995, SyStemix and Sandoz entered into a stock and warrant purchase agreement, whereby SyStemix issued to Sandoz additional stock in exchange for proceeds of $80 million that increased its share holding to 71.6%. This investment was supposed to give SyStemix a solid financial base for their clinical trials as well as their R&D efforts, and reflected Sandoz’ belief in the technological edge provided by SyStemix in oncology and gene therapy. On October 29, 1996, SyStemix announced that its Independent Directors on behalf of the minority shareholders had rejected the unsolicitated offer by Sandoz to acquire, at $17.00 per share, the outstanding shares of SyStemix that Sandoz did not already own. Finally, on February 19, 1997, this transaction was approved by SyStemix’s independent directors and Novartis acquired the remaining 27% of the shares at $19.50 per share. The offer price represents a 77% premium over the closing price of $11.00 per share on May 23, 1996, the last full trading day prior to Novartis’ (Sandoz’) original offer. This final part of the acquisition cost CHF 108 million ($76 million).

In contrast to the different and complex investment steps in SyStemix, the deal with Genetic Therapy was much more simple. After the initial acquisition of a small equity stake of $10 million in Genetic Therapy, in November 1991, Sandoz

made no further equity investment until the final acquisition of the remaining shares in July 1995 for $283 million.

The collaboration and subsequent acquisition of both companies, SyStemix and GTI, must be considered from an overall strategic perspective. *First*, Novartis puts a special emphasis on the area of biotechnology that can best be expressed in the words of Daniel Vasella, Chairman and CEO, who said that "biotechnology is an area of particular importance for Novartis" (Novartis AG, 2000, p. 2) or in a statement made by Wolfgang Samo, Novartis's former head of agribusiness (Novartis AG, 1999, p. 2):

> *"We think that companies that do not have basic biotech know-how will not be able to play this game in the long term."*

More specifically, gene therapy – as a part of biotechnology – is a type of genetic engineering that combats disease by replacing missing or defective genes or by conferring a new function on treated cells. This research is supposed to revolutionize the practice of medicine by translating breakthroughs in cell biology and genetics into superior therapeutics. Therefore, part of the motivation for the final acquisition of the remaining shares of SyStemix can best be presented in the words' of Daniel Vasella, Chairman and CEO of Novartis (Novartis AG, 1997, p. 1):

> *"Novartis and SyStemix are engaged in promising discovery activities in the development of cell and cell based gene therapies for cancer, AIDS, autoimmune and genetic diseases. With SyStemix fully integrated in Novartis, I am confident that we will accelerate the pace of our cutting-edge work with hematopoietic stem-cell technology."*

Thus, the *second* major motive for the first part of the acquisition of SyStemix was that it had a promising technology creating the expectation that gene therapy will provide interesting products in a period of five years from that time on. SyStemix had a patent issued that was expected to become very valuable. In close connection with this, the *third* motive needs to be considered. The acquisition of a big equity stake in SyStemix was also carried out because of the intention of getting a critical mass in gene therapy. This offer was accepted by SyStemix

because “the outstanding promise of SyStemix’ technology can be realized more broadly and rapidly as part of Novartis” (Dr. John Schwartz, President and CEO of SyStemix; Novartis AG, 1997, p. 1). The *fourth* reason, referring especially to the final, complete takeover of SyStemix, was the need to get control over SyStemix, because – up to that point in time – Novartis only had a stake of about 71.6%. Although Sandoz had bought a huge part of equity, they did not really get to control the company, but only got a chance to take a close look at it. In fact, they had many problems with SyStemix, because it was still a publicly traded company in the U.S., which implies all kinds of protection for minority shareholders. Hence, Sandoz was currently confronted with the statement from SyStemix’ management that (1) they need to act in the interests of all shareholders, not just in the interests of Sandoz, and (2) it was difficult to do deals with other companies due to Sandoz holding so much stock. Thus, part of the motivation for the final acquisition of SyStemix was that Novartis could gain control and run the company on its own.

The acquisition of GTI took place when this company was in the middle of a Phase II/III clinical study for brain tumors. Therefore, the acquisition enabled Sandoz to get access to the technology of GTI and also to a potential blockbuster. Before the final takeover, Sandoz only put in $10 million, got a seat on the board and signed a three-year R&D agreement. This kind of relationship is described by a former top executive of GTI as follows:

> *“At GTI, they [Sandoz] didn’t have that much of control, but in fact a lot of influence. It gave us a chance to begin to work together, to get to know each other and get the people involved. And there wasn’t the burden of this excessive control. Instead, it was much more possible to build a constructive relationship.” (Anonymous Interviewee 2)*

The acquisition of GTI by Sandoz provided them not only with financial support, but also with the access to resources, such as disease expertise and knowledge about how to best carry out a Phase III, so-called pivotal, clinical study. Here, Novartis’ knowledge about regulatory issues and their contacts with regulatory authorities and medical doctors all over the world was an important asset for GTI. This is also reflected in the following statement:

> *"There are a lot of resources that a big pharma company can bring to the table, and that's what I see now. Novartis has a product with great results in cancer and they are pushing that product to the market, faster than a biotech company could possibly ever do. When I see the kind of things Novartis can do, I think there is a real powerful engine in big pharma companies that biotech companies simply don't have. It is very powerful in the most positive sense." (Anonymous Interviewee 2)*

Organizational integration

In the following, the organizational integration of SyStemix and GTI will be depicted by (1) having a closer look at each case separately, (2) shortly discussing the reasons for the consolidation process, and (3) describing the outcome of this reorganization. After that, the integration of the different organizational elements will be described together.

Before the final takeover of SyStemix' outstanding shares, the company acted – more or less – completely on its own due to the fact that in the period from 1995 to 1997 Sandoz only had a stake of 71.6%. Thus, there were still some minority shareholders whose rights needed to be protected. As a consequence of this, just some kind of management review took place once a year. Apart from that, there were only a few Senior Managers from Sandoz sent to SyStemix. They had two major tasks: the first one was to establish an interface management between SyStemix and Sandoz in order to provide them with know-how about the processes within Sandoz. The second one was to gain a deeper insight into SyStemix in order to recognize the problems and to come up with an appropriate strategy. In the words of a responsible executive:

> *"They were more or less left on their own, with two or three Senior Managers from Sandoz, who were there. But, they did not change and realign the whole organization, instead they were responsible for an exchange of information. They provided them with the know-how about the processes and procedures. And, until you really know what is going on in such a company, so that you are able to shape a strategy, it takes at least two years." (Anonymous Interviewee 1)*

After the final acquisition of SyStemix, it was completely integrated into the matrix structure of Novartis including processes, financial, and strategic reviews.

The people of SyStemix were also integrated into international project teams combining people from both sides, who then took over the common responsibility for the projects already started at SyStemix. In order to ease the integration and to make people at SyStemix better and faster familiar with the structure, processes and procedures at Novartis, they brought in a few senior managers from Basel. From a legal and human resource point of view SyStemix was subordinated to Novartis U.S. In terms of R&D projects and budgets they had to report directly to the responsible board member for R&D in Basel. After the final merger, the project pipeline of SyStemix was reviewed and reduced significantly by concentrating and focusing their efforts on those that were the most promising ones. This was carried out in a common review which involved people from both sides, SyStemix and Novartis. The projects which were to be continued were identified. The rationale behind this is expressed in the following quotation:

> *"Furthermore, an independent company cannot focus just on one project. Thus, SyStemix was engaged in a number of various projects, because they could reduce and diversify their risk. One major project breaks down and one can show the investor, there we have another one. They had lots of projects in very early stages, which are not yet that expensive. After the final merger, the project pipeline of the company was reduced significantly by concentrating and focusing their efforts on those that were the most promising ones. Novartis gave the order to focus the efforts and in a common review which involved people from both sides, the projects which were to be continued were identified." (Anonymous Interviewee 1)*

As far as the transfer of knowledge or technology was concerned, there was in fact no transfer of know-how or technology from SyStemix to Novartis.

> *"It has never been the goal to transfer knowledge or technologies. If it [gene therapy] is interesting, you are going to do it there. However, there were two levels of interaction. Between the scientists there has been some exchange, because of their personal interests in each others research. Sandoz has also transferred one project to SyStemix. Apart from that, there is the Research Management Board, which meets every month and all research projects are presented and discussed there. This provides also some kind of exchange. But, the transfer of knowledge was not promoted, it was only in the interest of the scientists. As a global company, we can keep the knowledge where it is." (Anonymous Interviewee 1)*

After having depicted the initial steps of the SyStemix integration, there will now be the description of the first steps in the GTI integration. At the beginning "there was a lot of talk about keeping it relatively independent, but in fact very quickly it became 'rather' fully integrated" (Anonymous Interviewee 2). The most important project at that time was the Phase III clinical study for the brain cancer project. In order to realize this, a joint team with people from GTI, providing the knowledge about the technology and the product, and Novartis, being responsible for the regulatory affairs, was put together. With the creation of this project team, people got to know each other, and felt that they were pulling into the same direction as well as sharing the same goals. GTI was integrated into the structure of Novartis consisting of different international project teams organized by a central project management function in Basel, Switzerland. However, this process also caused some problems for the employees of GTI as the following quotation depicts:

> *"The systems are in place in a big pharmaceutical company and the people who are working in these systems are used to know them, accept and understand them through their work in accordance with them. However, we didn't know them. It took some time for us to figure out what we needed to do." (Anonymous Interviewee 2)*

In order to realize the integration and to help them to understand and work within these systems an executive from the project management function was sent to Gaithersburg. Moreover, GTI's head of research joined the research management board and the head of clinical study became part of the clinical group. As time went by, the people at GTI became more and more involved and acquainted with the structure, the reporting, and review systems of Novartis. However, "we floated around a little bit, and also at the beginning we resisted, because we thought at first it was gonna be more independent" (Anonymous Interviewee 2). During the integration process there was also no real transfer of know-how or technology from GTI to Novartis.

> *"We didn't transfer know-how or technology from GTI to Novartis. We were rather acting as a center of excellence." (Anonymous Interviewee 2)*

Apart from that, there was also the first consolidation process between SyStemix and GTI announced at the end of 1998. It took place because of two major reasons. First, there was a clear underestimation of length of gene therapy until a marketable product was expected to come up. Second, genomics and protenomics came up and offered also many opportunities making Novartis feel a strong need to participate in this market. As a consequence of this, the budget for gene therapy was cut down by 50%. In order to optimize Novartis' cell and gene therapy research and development efforts, SyStemix and GTI were to be combined under the leadership of Michael Perry, CEO of SyStemix at that time. It was also decided that the headquarter should be at SyStemix' site in Palo Alto, CA. Jörg Reinhardt, Head of Preclinical Development and Project Management at Novartis Pharma at that time, stated (Novartis AG, 1998, p. 1):

> *"This consolidation allows us to maintain critical mass and eliminate overlap. The free resources will be channeled into value-adding activities to tackle the scientific hurdles to gene therapy, which we have identified through our broad experience, including clinical trials. At the same time, we will retain access to the scientific communities and expertise on both coasts."*

At that time, the two companies employed together 450 people. Their consolidation made it possible to streamline administration, development and functions by reducing approximately 90 positions. The combination, however, did not touch on each company's research unit, which retained their autonomy and continued to operate at full strength at each site.

One and half year later, however, in mid-2000, the whole consolidation process was changed again. Now, GTI in Gaithersburg was chosen as headquarter and it was even decided to shut down SyStemix completely. All projects with SyStemix were stopped and GTI was henceforth considered as one of Novartis' research facilities, concentrating on oncology projects. At SyStemix, the value in terms of technologies or intellectual property one could bring to the market was reduced towards zero from 1992 to 1999. With the following quotation the description of the subsequent reorganizations will be terminated by giving a little insight in this process and the rationale behind it:

> *"When you are in a small company it feels more disruptive for example to be merged with SyStemix. Especially for them, because one year it looked that they were going to get the lead, because the headquarter was set up there. Then one and a half year later, they get shut down completely. This is incredible from their standpoint and I think there are a lot of bad feelings from the SyStemix-side. And certainly, it was also not easy to explain people at GTI why the headquarter was to be with SyStemix and not GTI. Then one and a half year later, people at GTI feel over-syndicated, because in the end they were getting the part of the company. It is complicated, because decisions were not straightforward due to the fact that you were always making decisions under uncertainty." (Anonymous Interviewee 2)*

After having described the different stages of the overall organizational integration and consolidation process, it is now necessary to look at how the different organizational elements were combined. Considering the aspect of culture there are two different points of view. The first obvious cultural gap is in terms of different country cultures between the U.S. and Europe. At SyStemix, however, there have been many Non-U.S.-Citizens, who have been trained in Europe. 50% of the PhDs and the management (representing one third of the staff) came from all over Europe. There were also a lot of Asians with a Bachelor degree in the Sciences field, approximately one third of the staff. This mixture of different people from different cultures, who had already been used to work together, simplified the collaboration after the acquisition, because it reduced the cultural gap in terms of communication and decision-making. In the case of GTI, there were also no difficulties in terms of different country cultures. The second point to consider is the difference between a small biotechnology start-up and a big pharmaceutical company. Here, the focus lays on the company perspective, and a closer look clearly reveals a bigger gap:

> *"Nearly everybody [of the senior management at GTI] left, because they [Novartis] no longer looked for a local management team. We were used to make common decisions, taking much more risk and common responsibility. And they no longer looked at the local management to really do that so much. In some ways I feel a sense of lost in the culture of the company. [...] You won't get entrepreneurial behavior in the future out of a company like GTI. It does still not longer expect to act that way." (Anonymous Interviewee 2)*

There can be no doubt that there is a clear shift in the overall culture of GTI and the expectations concerning the way the management is supposed to act. The question which comes up now is, what happens to the small company?

> *"Now it is more like a Novartis research facility. I must say that whatever entrepreneurial spirit that exists at the research facilities of Novartis all around the world, the same spirit exists at GTI. That's different from being an independent company. I am not saying that the spirit of discovery is gone. I am not saying that." (Anonymous Interviewee 2)*

These two quotations clearly demonstrate that the culture of the acquired company, GTI, definitely changed, and the company itself turned more into a part of Novartis acting according to the way business was made at Novartis. The final question which arises is whether it is worth changing or not. The answer to this is given in the following statement.

> *"It [the entrepreneurial spirit of the company] definitely changes. I think you need to discuss, if this change is for better or for worse. And in the end your objective is to bring products to the market, and maybe, you need to sacrifice it for this goal. [...] I think one view of these kinds of relationships is the failure that they kill the entrepreneurial spirit of these companies. But, I don't think that it is the correct view, because I think there is a bigger picture – even though I come out of this company. Of course, my feelings sometimes are a little bit sad, because their culture is so different now, but I recognize toward the ultimate objective of developing a therapy for a disease it is probably better." (Anonymous Interviewee 2)*

As a consequence of such a cultural change a lot of people from the senior management of SyStemix left on a voluntary base, because they did not want to be part of a big organization, instead, they preferred being at the top of a smaller organization. As far as middle management and scientists were concerned, there was far less turnover, because they felt that their job was more secure by being part of a big group. Moreover, they also got access to new resources and could continue to do what they always liked to do: research. Besides, a "fluctuation up to 20% in a US-biotechnology company is a normal phenomenon" (Anonymous Interviewee 1). The same happened in the case of GTI. Nearly everybody from the senior management left, whereas nearly all of the researchers and scientists

stayed in the company, because "under Novartis the money that was available for good programs was much more than the money that we were able to raise in the public stock market" (Anonymous Interviewee 2). More generally speaking, if a special biotechnology company – as long as not being integrated into a big group – has a failure in clinical trials than it will get in big trouble, perceive pressure from the capital markets, and is also forced to lay off people. Later, if there is again a positive development, they will have to hire again. A big group like Novartis can provide much more stability. Before the final merger with Novartis, there had been several rounds of ups and downs for SyStemix as well as for GTI.

> *"Besides the management group, few people left, because they felt they had good opportunities. Perhaps we had a little increase in turnover at GTI, I don't know, except for the senior level. For research scientists it was good, because of the better resources they received." (Anonymous Interviewee 2)*

The human resource management at both companies was adjusted according to the specific Novartis' conditions in the U.S. market. This bears one important problem. SyStemix as well as GTI had stock option programs, in which "virtually everybody in the company participated" (Anonymous Interviewee 2). In contrast to this, a big pharmaceutical company has far less, more restricted stock options programs, but better pension plans. In the case of SyStemix, it was observed that especially younger people rather go for stock options, whereas the older ones prefer secure pension plans and a securer job. Consequently, as far as the recruitment was concerned, one third of the applicants wanted to get stock options, which they did not receive, and hence, rejected the job offer. At GTI, people were in a first step quite happy with 'losing' their stock options, because all the options were immediately vested and people received a lot of money at once, they otherwise would have had to wait for five years. After that 'stock options' were limited to about 20% of the people. Moreover, these were not real stock options but stock appreciation rights. People also started to complain about it, because

> *"stock options are part of the culture in the U.S. In fact, it was something that changed the culture, because before everybody at GTI had stock options. You got a new secretary and after six months she got stock. [...] Having Sandoz coming in made everybody vesting immediately, that was a big deal. [...] But then, the fact*

that only a small percentage of the people got stock options, and it wasn't real stock options, it was called stock appreciation rights, it was a sour point that not so many people got them." (Anonymous Interviewee 2)

Further realignments took place during the consolidation between SyStemix and GTI. Again, there have been a few replacements on a voluntary and unvoluntary base. A few senior managers had to leave the company due to the fact that some departments were harmonized by establishing bigger units. E.g., at GTI two units existed, Development and Operations & Manufacturing, and each of them had a VP and 30-40 employees. At SyStemix, there were two similar units in which 30 employees worked in Development and approximately 100 employees worked in Operations. This leads to a total number of four VPs, not really communicating with each other, because of everybody trying to be the most successful and important one among them. During the consolidation between SyStemix and GTI these four separate units were put together to one unit. What is interesting in this context is that all employees who got an offer to move to the other site preferred to remain at the same location. Novartis had to recognize that people did not want to move from the west to the east coast or the other way round.

"This is really an important aspect. You can acquire people with their knowledge and technology, but both are very closely related to a specific site. You can't transfer neither people nor technology. [...] As long as you keep up the site knowledge remains more or less within the site." (Anonymous Interviewee 1)

Organization of the integration process

The next interesting topic is the organization of the integration process itself. In the case of SyStemix – as well as in the case of GTI – there was no real big integration plan or integration structure set in place.

"After the acquisition, there was no real integration plan. A few people were sent to Palo Alto in order to ensure a smooth transition. At the final consolidation between SyStemix and GTI there we had a strict integration plan, but not at the first integration after the acquisition." (Anonymous Interviewee 1)

As already pointed out during the description of the organizational integration at the beginning, a few senior managers from Novartis were sent to SyStemix in

order to make the people familiar with the processes, procedures and systems in place. Some of them became part of the board, and they were also the persons responsible for the organization of the integration process. This was realized by sending experienced senior managers from Novartis to SyStemix in order to help them to adjust their organization according to the specific needs of the mother company and learn from each other by working together on a day-to-day base. This exchange did not only take place on a top and senior management level, but also included middle management as well as scientists – although this was not really part of the integration process, but in fact made the whole process easier. In this context, Novartis realized that is not that easy to find the right persons, because many of them have children required to attend school and are not truly ready to leave. Moreover, the younger ones do not have enough experience and knowledge about the organization in order to do this kind of job and to ensure a smooth organizational integration. In the case of GTI, the situation was quite similar. There were also some executives coming from Novartis to GTI helping them on a day-to-day base to get acquainted with the systems and structures in place.

In addition to the different topics mentioned there are also some other important points to consider. *First*, it is very difficult or even almost impossible to say whether the companies would have been more successful without having been acquired and integrated in Novartis or not.

> *"I often thought: If we had not been bought by Sandoz/Novartis, I probably would have had to lay off people anyway, because of the stock markets. It was very difficult to raise money and if you look at all the other gene therapy companies, they all went through that. So, I don't have any illusions about how it would have been so much easier without the acquisition. I think you can say that in some ways it could have been worse, if Novartis didn't have bought the company. [...] Without question with the help of Novartis we were able to set up some packages in order to ensure a reasonable transition without panicking about it." (Anonymous Interviewee 2)*

What becomes clear from that statement is that Novartis could give some stability to that situation. The *second* point, which is in close connection with the first one, is that it is really very difficult to evaluate a specific technology and make reliable projections about their potential development. It is always a decision

under high uncertainty, because one does not know about the outcome of a technology. In the case of SyStemix, Novartis also had to realize that they created a very positive image of themselves during the Due Diligence process as part of the selling. Novartis has more than 1000 academics in Research all over the world. There is at least one million of researchers and every company can only cover a certain (small) percentage of the possible research. And by this, the probability for a discovery in external research facilities is of course higher than internally. Thus, one has to observe where the major trends are and to decide where it is worth starting to engage, while being aware of the fact that there is a lot of risk involved in such a decision. *Third*, if one looks at the know-how, the patents and the technologies before and a few years after the merger, then it is undeniable that a lot of knowledge and technologies simply has been stopped and thus is lost, because it was decided to focus on the most advanced projects. *Fourth*, comparing these two acquisitions Novartis learned "that you can do such an acquisition [the acquisition of GTI] with far less money than they did in the deal with SyStemix" (Anonymous Interviewee 2). Thus, the two overall questions for evaluating such a deal are:

> *"I think a company like Novartis is still evaluating: 'Do we need to control the whole company in order to get the maximum benefit?' And the other question is: 'When do you need control?' But, you can't make a straight statement about that. You need to look at each company case by case, what is the technology, what is the timing etc." (Anonymous Interviewee 2)*

3.4.2 Within-case analysis

This section – again – tries to analyze and draw some conclusions from the given data as a step towards building theory from case study research. The framework for performing the within-case analysis is the same as already used in the two within-case analyses before. Compared with the other cases the specialty of this case is the analysis of two acquisitions by one company in a complementing technological field, Novartis' acquisitions of SyStemix and Genetic Therapy (GTI), which finally were consolidated under one roof. The analytical focus of this section, however, lays on the integration and collaboration activities subsequent to each respective acquisition and not on the analysis of the

consolidation process between SyStemix and GTI. However, the latter integration process is used in order to add a further perspective when making a useful contribution and to give the appropriate, overall picture of these two cases.

As far as the motives for the acquisition were concerned, the one major, underlying motive for both acquisitions lays in the fact, that biotechnology is a very important area for Novartis, in which they will play an important role. Furthermore, in the case of SyStemix, Novartis considered gene therapy as a very promising technology with great growth potential, in which it wanted to get a critical mass immediately. In other words, they had a patent which was expected to become very valuable and thus a potential blockbuster. Apart from that, Novartis needed to gain control over SyStemix after having had some serious problems in handling the company. Besides the access to the technology, the final acquisition of GTI took place, because it was in the middle of a clinical Phase II/III and Novartis hoped to get another potential blockbuster. Taking all this into account, the two major motives for the acquisitions emerge. First, there is the more general motive for the acquisitions, the perceived need of being active in the biotechnology sector and, by this, participating in the expected growth potential of this industry. Thus, this can be considered as the overall, long-term orientated strategic rationale behind these decisions. The second, more short-term orientated motive was the hope of getting a blockbuster within a shorter period time and, by this, making more profit and paying off the investments made.

From the point of view of the biotechnology companies the reasons why they accepted the takeover bid was: (1) getting access to vast research resources and knowledge provided by Novartis, (2) getting financial support in order to stabilize the company’s situation, and (3) receiving help with regulatory authorities while carrying out a Phase III clinical study.

Having analyzed and accepted these motives on both side, the question is how to manage the integration and encourage the two parties in their collaboration that these motives also turn into reality. This needs to be done in realizing the relevant integration topics of organizational/structural integration, knowledge/competence integration and transfer, cultural integration, as well as personnel integration.

Although not quite obvious at a first glance, there are two different levels of organizational integration that can be distinguished. After the final acquisition of SyStemix as well as GTI they were both integrated into the international project teams, which combined people from them, as well as Novartis, and these teams also reported directly to the Board in Basel. However, this kind of integration was only focused on the most advanced projects of GTI as well as SyStemix, those projects which were in Phase II and III of clinical trials and thus had the potential of becoming a blockbuster. Following this kind of integration strategy Novartis tried to gain a certain degree of control over the last steps during clinical trials. The major task in this context was to manage the combination effectively. As a result, the project teams combined the technology and product know-how from SyStemix respectively GTI with the knowledge about regulatory affairs and Phase III clinical trials of Novartis. With this combination they were able to carry out the Phase III clinical studies much faster than the small biotechnology companies could have ever done on their own. This integration approach was chosen in order to realize Novartis' short-time motive of getting a blockbuster.

Apart from that, there was also a second strategy, which was indeed not quite obvious. During the first consolidation step between SyStemix and GTI, all areas were supposed to be combined – development, operations, functions and administration – with the exception of the research units. It was explicitly stated that they should retain their autonomy and continue to operate at full strength at each site as they did before. This integration strategy tries to preserve the independence of the two research units. Furthermore, this integration approach is perfectly in line with the second major, long-time orientated motive of the acquisition, the goal of being active in the biotechnology industry and participating in its growth potential. This strategy can only be realized if some parts of Novartis, in this case SyStemix and GTI, carry out research on their own and, by this, retain access to the scientific communities and expertise on both coasts.

Having these two different integration approaches in mind, it is now necessary to have a closer look at how the various organizational elements were combined during the integration process. From a strategy-making and financial reporting/budgeting perspective both acquired companies, SyStemix and GTI, were directly responsible to the respective board member in Basel and they also

had to undergo the same review processes for their projects as they were part of the Research Management Board, where all projects needed to be approved. Of course, freedom is granted in how they perform the basic research on a day-to-day base. However, the overall strategic decision about what projects in which therapeutic field will be continued is made during these board meetings. This also reveals that there is a kind of cut in responsibility depending on what step of the pharmaceutical value chain is looked at. During the early stages of research the responsibility laid in the hands of the acquired biotechnology companies. But the closer a product gets to the final phases in clinical trials the more control and responsibility is taken over from the headquarter in Basel which is also very well reflected in the two different integration approaches. Hence, the degree of autonomy granted depends on the position of the project in the pharmaceutical value chain.

At Novartis, the management was aware of the fact that the introduction of the project management and the reporting system is not that easy. In order to make the people at SyStemix and GTI familiar with the systems, processes and procedures in place at Novartis, experienced managers from the headquarter went to the different sites and trained and helped the people locally to handle these new things.

Another important topic in the post-acquisition context is the possible access and transfer of knowledge. Referring to the quotation of Wolfgang Samo, Novartis' former head of Agribusiness, in which he emphasizes that every company in this industry needs to have a basic biotech know-how, one might draw the obvious conclusion that the acquired knowledge and technologies will be transferred from the acquired biotech companies to Novartis. Instead, in both cases the transfer of knowledge was not carried out, it was not even intended. Both interview partners stated that there was neither a technology nor a knowledge transfer. Of course, there was some kind of 'basic exchange' by the presentations held at the meetings of the Research Management Board or by scientists from Basel being at SyStemix or GTI on job rotation, because they had a personal, scientific interest in it. However, there was never the idea of systematically transferring the knowledge or the technology.

Having a closer look at this phenomenon the explanation is relatively easy. Through the acquisitions GTI and SyStemix became integrated in Novartis, which means that they were part of the structure and that every unit within Novartis might get access to their knowledge and technologies, if necessary. This is also stated in the quotation of Anonymous Interviewee 1 who pointed out that Novartis as an global company can keep the knowledge wherever it is. E.g., GTI considered itself as a center of excellence for gene therapy and vector technology within Novartis. If another unit of Novartis has a request linked with gene therapy or possible applications of vector technology in a different segment, it is GTI who will support them by solving a specific technological problem for them. This was e.g. done in the field of transplantation from animal organs to humans. But, the basic knowledge and technology remained within GTI.

Apart from that, Anonymous Interviewee 1 made another very important remark concerning the transfer of knowledge. The value of a specific knowledge and technology is closely related to a specific site which emphasizes the importance of the geographical aspect of knowledge and the fact that the special knowledge and technology applied in biotechnology are embedded in some kind of local network. Without this embeddedness it will get lost. In other words, this would even deny any possible flow and transfer of knowledge and technology beyond such a local network.

The above paragraphs have already contained some surprises as far as the non-transfer of knowledge and technologies is concerned. From a cultural point of view there are also two dimensions which need to be distinguished, one of them providing a big surprise. *First*, there is the difference in the country culture between the U.S. and European based Novartis. In both cases this difference did not play an important role, because both sides were used to work in an international environment consisting of different people from different cultures. What is even a little bit more surprising was the fact that there were difficulties in both consolidation efforts between SyStemix and GTI in which people from both sides were reluctant in moving from the east to the west coast, in the first consolidation, or the other way round, in the second consolidation step.

Second, this case analysis reveals that the cultural gap between big pharma and small biotech is much more important and also provides some interesting

insights. As a result of the acquisition by Novartis most of the top/senior management of the small biotechs left, because the local management was no longer expected in making common decisions, taking huge risks and acting in an entrepreneurial way. The question which consequently arises is why they are no longer expected to act that way. During the case description two quotations were cited which give a preliminary answer to that question. First, both companies – and after the consolidation only GTI – have finally turned into Novartis research facilities as far as the research field is concerned. Here, they were granted a relatively high degree of autonomy in carrying out their research, while the overall research strategy is agreed upon during the meetings of the Research Management Board. Carrying out this basic research does not necessarily imply that the researchers need to have an entrepreneurial spirit. In fact, they do not need to have that spirit. However, what they definitely need to have is the spirit of discovery. This basic spirit of discovery is independent from the fact of being entrepreneurial or not, which is also emphasized in the quotation of the Anonymous Interviewee 2 who stated that

> *"whatever entrepreneurial spirit that exists at the research facilities of Novartis all around the world, the same spirit exists at GTI. That's different from being an independent company. I am not saying that the spirit of discovery is gone"*.

It is obvious that the entrepreneurial spirit and the spirit of discovery are two separated things. The entrepreneurial spirit of the company was gone at that moment when Novartis took over the responsibility and control over the Phase II/III clinical trials and the senior management of GTI left, because they were no longer needed to carry out this task. Furthermore, Novartis was aware of the fact that this was a development which cannot be stopped. In some way, it even was expected and of course also accepted due to the fact that the ultimate goal was to carry out the clinical Phase III with all regulatory requirements as quickly as possible and, by this, bringing a new therapy for a disease to the market. That is indeed something in which Novartis is by far better than a small biotechnology company, because in this field it has a lot of experience a small biotechnology company simply does not have, because they have never done this before. This special kind of entrepreneurial spirit is no longer needed, because now it is 'only' a question of efficiently and effectively carrying out these clinical trials in a given

framework. This is also perfectly in line with the short-term motive and the corresponding integration strategy Novartis applied. They aimed at getting a blockbuster as quickly as possible and therefore voted for the immediate integration of these steps, i.e. as far as these late-stage projects of clinical trials were concerned. Thus, they sacrificed the entrepreneurial spirit for the goal of bringing a product to the market. That is a simple trade-off question and from the strategic point of view of Novartis, probably the best they could do. It is a completely other question whether such a decision is for better or worse for the future survival or the entrepreneurial spirit of the small biotechnology company. In this case the question is not about keeping up the entrepreneurial spirit of the biotechnology companies, instead, it is about the ultimate objective of how developing a therapy for a disease and bringing it to the market as quickly as possible. From this point of view, the entrepreneurial spirit does not matter anymore. For the realization of their long-term goal of being active in biotechnology and retaining access to the scientific communities and expertise in biotechnology, the existing spirit of discovery is sufficient.

This cultural change is also reflected in the reactions of the employees at both companies. In order to evaluate this it is necessary to mention again that a fluctuation of up to 20% is a common thing in a U.S. biotechnology company. As far as the top management of GTI and SyStemix was concerned nearly all people left, except one or two persons who were needed in order to ensure a smooth transition. These executives received good offers in order to make them stay. Besides this, some senior managers were sent from Novartis to the newly acquired companies in order to make their staff familiar with the new systems in place. The reaction of the top management of the small biotech companies is quite normal and comprehensible, since they do not want to be part of a large organization and only ‘implement the orders’ provided by the headquarter in Basel. Instead, they want to keep up their entrepreneurial drive, make decisions on their own, and take over the necessary responsibility. Thus, it is not very surprising that many of them preferred to leave in order to look for a new challenge. And in fact, with the regard to the ultimate objective of bringing a new product to the market they are no longer needed. Novartis only needed to make sure that there were one or two of the former top executives who remained in the company in order to act as some kind of integration managers and to realize a

smooth transition by providing some stability and continuity – and that was what they did.

From the point of view of the researchers there was no big change anyway. These people were not really driven by an entrepreneurial spirit, but by a spirit of discovery hoping to receive the Nobel laureate. Hence, they could continue to do what they had always been doing, research. Furthermore, their situation got even better, because they had access to the vast resources at Novartis which made their work more efficient and easier. By this, the researchers perfectly fulfilled the expectations Novartis had vis-à-vis them. To sum up, these cultural alignments and the reactions of the employees fit absolutely with Novartis' motives connected with the acquisitions.

Another crucial issue which needs to be discussed in this context is the question of stock options. Both companies, SyStemix as well as GTI, had issued stock option plans as incentive systems. In fact, it was even more as an incentive system, because stock options are rather considered as being part of the culture in U.S. companies, especially in entrepreneurial driven biotechnology start-ups. Not having or not offering stock options makes it difficult for an acquirer, because – and that is also an important point – it affects *afterwards* the general atmosphere in the company. In the concrete moment when the company is taken over and people 'lose' their stock options by immediately vesting all of them, they may receive a lot of money, as they otherwise – if anyway – would have to wait for a more few years. At that particular point in time, they like vesting their stock options. But, when all the options are gone and only a few people from senior management receive some kind of options, it changes the overall atmosphere and relationships in the company.

In addition to that, SyStemix had also a problem in recruiting young people, because they expected to get stock options. However, this is a general problem for European groups acquiring a U.S.-based company which cannot easily be solved. Thus, that is something these companies have to live and cope with. Apart from that, it is also a consequence from the change in ownership which goes along with a change in the company culture and, of course, also in the way people get paid. On the other hand, big pharmaceutical companies have of course something else to offer. Being employed by a big pharmaceutical company

implies that people's job security is higher and that they also provide better pension plans. These are two things some of the employees do appreciate. In the end, it is therefore a trade-off question.

Having discussed and analyzed the different integration topics it is also necessary to depict the organization of the integration process itself. First, there is the subject of responsibility and support for the acquisition decisions. From the case description it became obvious that there was full support from the headquarter's management board. The reporting was also done to the respective board member. The integration itself was carried out by sending two to three senior managers from Novartis to the acquired companies, who partly became member of the respective board in order to make them familiar with the systems and processes in place at Novartis. In fact, these persons took over the tasks of an integration manager. However, there was no real integration plan established, instead, the people of SyStemix and GTI were trained on a learning-by-doing base. Moreover, their heads of Research and Clinical trials joined the Research Management Board, respectively the clinical trial group. The decision about what projects were to be continued and what projects were to be terminated was carried out in a common review, so that both sides agreed upon that. Nonetheless, the problem was that they were floating around and people at the two companies also resisted to become part of Novartis at the beginning, which reveals that an integration plan with clearly defined measures and targets was missing. Apart from that, they resisted, because they expected to be more independent, a fact which also was either not really decided upon, at the very beginning, or was not communicated. The existence of an integration plan could have made that much easier.

At the end of this within-case analysis a few more remarks are necessary, because in the end it turned out that the acquisition of SyStemix did not pay off. This shows that it is very difficult to evaluate such a technology and their potential during the Due Diligence process. Furthermore, the Phase III clinical study of GTI had to be stopped as well. As a consequence of these failures, Novartis decided to consolidate the two companies and finally even came up with the decision of closing SyStemix completely. Only Novartis was able to carry out the decision of shutting down SyStemix, because this is a decision SyStemix itself – as a publicly traded company – could never have made. The senior managers of a publicly traded company could never do that, instead they would keep 'running

around and trying to muddle through'. Under Novartis' ownership it was possible to make that decision, because from their perspective it is 'just a question of an effective resource allocation' and, hence, the decision about further investments in a specific project or not. From Novartis' point of view it was not a question about the future survival of the company. They had to take a bigger picture into account and had to decide about a good resource allocation bringing them closer to the ultimate goal of developing a new therapy or medicament/remedy for a disease. This leads to the conclusion that such an acquisition is in some way only considered as an investment project that pays off or not. Provided that this project does not pay off, there will be no further money and the project will be terminated.

3.5 The case of Bayer Diagnostics Corp. – Chiron Diagnostics Corp.

The objective of this case is to describe the post-acquisition integration of Chiron Diagnostics into the organizational structure of Bayer Diagnostics Group. Firstly, a brief general corporate profile of Bayer with a specific focus on its Diagnostics Group will be presented. The corporate profile of Chiron Diagnostics and its parent company Chiron Corp. will be depicted along with the history of Bayer Diagnostics. Secondly, the case will focus on the description of Chiron Diagnostics' integration into the structure of Bayer's Diagnostic business group.[38] Thirdly, there will be the within-case analysis. This case is in some ways different, but, at the same time, also very similar to the other three cases. It is similar, because, at least to a certain extent, it treats the integration of a biotechnology company in the structure of a big health-care focused company. However, it diverges, because the integration of the specific biotech business is only one particular part of it, as most of the integration is about the integration of the more 'traditional' diagnostics business of Chiron Diagnostics, which consisted to 90% of the former Ciba Corning Diagnostics Corporation. Nevertheless in each statistic or overview, either from Goldman Sachs (2000), PricewaterhouseCoopers (1999a), Burrill & Company (2000) or Recombinant Capital about M&A activities between pharmaceutical and biotechnology companies, this case is referred to as being a pharma-to-biotech deal. Thus, this case even combines two different perspectives, one dealing with the 'common' integration activities of a big integration and the other emphasizing the biotech integration activities, which – as we will see during the case description and the within-case analysis afterwards – can be very well compared with the other cases.

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[38] This case study draws on one preliminary discussion with an executive from Bayer as well as on a transcribed interview with two executives from Bayer Diagnostics. Furthermore, this case is based on annual reports, form 10-Ks/Qs, public speeches, press releases by all companies named herein, the biotechnology information service Recombinant Capital (http//:www.recap.com) as well as analysts' reports.

Corporate profiles

Originally, Bayer was founded in 1863 under the name ‘Friedrich Bayer et comp.’ in the town of Barmen, situated in the industrial Ruhr region. In its early years, the company developed and produced dyestuffs, but quickly added other chemicals to its product line. The year 1888 marked the entry into pharmaceuticals, when a by-product of dyestuffs was marketed as medicine. In 1896 systematic pharmaceutical research began with the establishment of the company’s first pharmaceutical laboratory. European as well as North American markets were entered early in the company’s history. In 1865, only two years after its establishment, Bayer purchased an interest in a coal tar dye plant in Albany, NY. Like most German companies, Bayer experienced setbacks in its international operations after World War I and World War II. After World War I Bayer’s name, the Bayer-Cross trademark, and the product name Aspirin were confiscated by the United States. Only in 1994 did Bayer regain the rights to its name in the U.S. through the acquisition of the OTC drug business of Sterling Winthrop.

Nowadays, Bayer is represented with about 350 companies in virtually every country of the world. Business activities are concentrated in Europe, North America and the Far East. Of the company’s 120,000 employees about 58% work in Europe, 20% in North America, 8% in Latin America, and 14% in Asia, Australia, and Africa. In fiscal 2000 Bayer reported a net income of EURO 1.8 billion on sales of EURO 31 billion. Europe accounted for 42% of Sales, North America for 31%, Asia/Pacific for 16% and Latin America, Africa and Middle East for 11%. In 2000, Bayer spent a total of EURO 2.4 billion on research and development, of which EURO 1.4 billion was spent in the Health Care segment. The annual reports for fiscal 1998 and 1999 emphasize that continued growth in the important markets of North America and Asia is expected relative to Europe. Moreover, by 2010 Bayer expects to generate 25-30% of global sales in Asia.

Bayer is organized as a diversified chemical and pharmaceutical group offering over 10,000 different products in four business segments. The responsibilities for the business operations rest within different business groups. Figure 21 provides an overview of the group’s organization.

Board of Management

Business Groups

Health Care
Pharmaceuticals
Diagnostics
Consumer Care

Agriculture
Crop Protection
Animal Health

Polymers
Plastics
Rubber
Polyurethanes
Coating and Colorants
Fibers

Chemicals
Basic and Fine Chemicals
Specialty Products
Wolff Walsrode
Haarmann & Reimer
EC Erdölchemie
H.C. Starck

Corporate Divisions

Corporate Planning and Controlling

Finance

Legal, Patents, Licences, and Insurance

Corporate Communications

BPR/ SAP Program Management at Bayer

Central Service Divisions

Procurement
Human Resources
Information Systems
Central Technology
Central Research
Central Logistics
Site Services, Environmental Protection and Safety
Enterprise Accounting and Reporting

Source: Bayer AG (2001)

Figure 21: Bayer AG organization

The diagnostics business of Bayer has its U.S. roots in the 1978 acquired Miles, Inc., a company having been among the pioneers of the diagnostics industry. Already in 1941, Miles revolutionized in vitro diagnostics, when it launched *Clinitest* effervescent urine sugar testing tablets as the first convenient and accurate test to detect the presence of sugar in urine. In 1964, Miles scientists developed *Dextrostix*, the first dry reagent blood sugar test, enabling people with diabetes to monitor blood sugar levels quickly at home. Also at the beginning of the 1940s, Technicon Instruments Corporation developed the *Autotechnicon*, a tissue processing instrument, that introduced automation to the histology laboratory. Later, in 1957, the first fully automated blood chemistry analyzer (*Autoanalyzer*) was developed based on a newly discovered continuous flow technology.

In 1989, Miles, Inc., acquired Technicon in order to expand its existing range of diagnostics systems. Miles provided the ability to take complex chemistry and make it available in a series of simple, easy-to-use test systems, whereas Technicon offered a wealth of engineering and electronic capabilities that allows a sophisticated piece of equipment to perform thousands of tests quickly and

accurately. The 1994 acquisition by Miles of Sterling Winthrop's North America over-the-counter drug business – as already mentioned before – returned to Bayer the rights of the Bayer cross and the Bayer name in North America.

Ciba Corning Diagnostics was already formed in 1985 as a joint venture between Corning, Inc., and Ciba-Geigy. The company was acquired by Chiron Corp. in 1995 as part of a strategic partnership formed between Ciba Geigy (now: Novartis) and Chiron, a leader in successful commercialization of biotechnology products. Chiron Corp., headquartered in Emeryville, CA, is a leading biotechnology company that participates in three global healthcare markets: therapeutics, vaccines and blood testing. In support of these businesses, Chiron conducts research and development in the fields of biological proteins, gene therapy and combinatorial chemistry. In contrast to this, Ciba Corning had revolutionized critical care diagnostic testing by creating the first automated blood gas system. Moreover, the company's technological track record includes innovations such as the first immunoassay using glass beads as a solid phase and a magnetic separation method. Chiron's scientific and medical leadership provided Chiron Diagnostics with the opportunity to bring exciting new proprietary molecular diagnostic technology, such as branched DNA probe diagnostics, to the healthcare market. These bDNA assays are expected to enhance significantly patient treatment by measuring the level of virus or viral load in the body. This technology is currently used with patients infected with HIV or the Hepatitis C Virus. Chiron Diagnostics was headquartered in Walpole, MA, employed approximately 3,300 people, had 22 sales subsidiaries and had revenues of $500 million in 1997. Finally in 1998, Bayer Diagnostics and Chiron Diagnostics combined to form the new Bayer Diagnostics.

Bayer Diagnostics has a decentralized organization with five business segments having the worldwide responsibility for their specific segment and product lines and also focusing on product development, marketing strategies, and global business strategies. These organizational structure is already the result of the integration with Chiron Diagnostics. The business segments are Self-Testing, Near Patient Testing, Critical Care Testing, Nucleic Acid Diagnostics (NAD) and Laboratory Testing. By this, Bayer Diagnostics covers the three major industry market segments Self-Testing, Point-of-Care Testing and Laboratory Testing, which means that five business segments are serving three customer segments.

Furthermore, four regions have the responsibility for defined geographic areas including products and services of all business segments. These four regions are Europe, Japan, North America and Regions of the World (ROW). The different functional areas include Finance/Controlling/Administration, Strategic Planning/Business Development/Communications, Human Resources, Quality Assurance/Regulatory Affairs and Legal support. The company has more than 50 branch offices, seven major manufacturing plants and an extensive distribution network covering over 100 countries. In fiscal 2000, the Bayer Diagnostics Group increased sales by 17% to EURO 2 billion compared with EURO 1.7 billion in 1999.

3.5.1 Case description

Acquisition process and motives

The merger between Bayer Diagnostics and Chiron Diagnostics was announced in mid-September 1998 and finalized on the 30th of November 1998. Bayer Diagnostics bought Chiron Diagnostics in a deal worth $1.1 billion in cash plus licensing and royalty fees from certain intellectual property pertaining to hepatitis C and HIV for use in nucleic acid diagnostics worldwide. This deal enabled Bayer to increase its share of the world diagnostics market from 6.5% to 10% by consolidating its position in the medical laboratory diagnostics, emergency healthcare and diabetes self-monitoring markets. Bayer and Chiron have complementary ranges. Chiron is present in the immunodiagnostics, molecular biology, infectious diseases diagnostics and blood gas monitoring markets. Bayer covers the whole diagnostics market, with the exception of microbiology. The diagnostics market is characterized by an overall growth of 5-6% per year, while several high-growth segments such as NAD with +20%, cancer with +15% and Diabetes with +13% can be identified. In 1999 – after the acquisition – Bayer Diagnostics ranked 4th on the world in the in-vitro diagnostics market behind Roche Diagnostics (16.8% of the market), Abbott (15.8%) and Johnson and Johnson (11.7%). It ranked 5th on the laboratory analysis market, which – although being the largest market – is the least profitable one. On the health care and emergency care market it ranked 3rd, as it did on the promising self-monitoring market (where growth is 13% per year). However, until 2003 Bayer Diagnostics hopes to achieve a total of 15% market share.

The acquisition of Chiron Diagnostics was part of an overall strategic planning project, which had been carried out a few years before and which led to the conclusion that Bayer Diagnostics needed to get a broader portfolio by some kind of partnership agreement or acquisitions in order to remain competitive in the future. This plan had also been approved and was supported by the Management Board of the Bayer Group in Leverkusen. The importance and contribution of the Diagnostics Business for the health-care segment can best be expressed in the words of Dr. Gerald Wagner, previous Head of Laboratory Diagnostics in Bayer's Diagnostics Business Group (Bayer AG, 1999, p. 85):

> *"Early diagnosis of a disease can mean considerably lower treatment costs, a shorter hospital stay, or can even make the difference between life and death in an extreme case."*

From the point of view of Bayer Diagnostics the merger between Bayer Diagnostics and Chiron Diagnostics was carried out because of several reasons, which also represent the strategic rationale behind the decision. *First*, it was a question of getting a critical mass. Due to a consolidation process the diagnostics market has become less fragmented with Roche's acquisition of Boehringer Mannheim, the merger between Beckman and Coulter, Johnson & Johnson's purchase of Kodak's diagnostics business, as well as the merger between Dade and Behring. In order to remain a global player and to become among the top-three players, Bayer Diagnostics had to react. *Second*, Bayer Diagnostics had some new products coming along and, hence, they intended to broaden the customer base, especially in the area of Point-of-Care Testing. *Third*, Chiron Diagnostics was active in several business areas, particularly the Nucleic Acid Diagnostics (NAD)[39] based on Chiron's know-how in biotechnology, in which Bayer was not in. By this, Bayer could get access to new, valuable technologies and enter a fast-expanding and very promising field, which is based on biotechnology know-how and is expected to play a dominant role in the detection

[39] 'Branched DNA technology' is the basic technology used for nucleic acid diagnostics, also referred to as NAD-business in the following paragraphs. With the help of these technologies it is possible to determine the viral load in serum and plasma much quicker than before.

and monitoring of infectious diseases and cancer in a market with estimated annual growth rates of 20%. *Fourth*, there were also many synergies and complementarities between the two companies which were to bring annual cost savings of about $120 million from 2001 on by consolidating manufacturing and R&D activities and locations in order to increase efficiency and reduce manufacturing costs.

Chiron Corp., the mother company, on the other hand, wanted to refocus their activities on their core business (biotechnology) and improve their long-term performance, so that they were divesting some specific businesses (Chiron Vision to Bausch & Lomb, the controls business to BioRad and its electrophoresis business to Helena Labs), established cost improvement programs, started with the rationalization of manufacturing capacities and launched a program to focus on R&D activities. For Chiron, which received its diagnostics unit through the deal with Novartis, the diagnostics business provided two advantages. On the one hand, this business unit served as a revenue earner, because, in contrast to the rest of the company, it made money from the very beginning on. On the other hand, Chiron also had the branched DNA technology, but had no vehicle to bring it to the market, until they got the diagnostics arm. However, after their first drug started to kick-off and earn revenues, the diagnostics business took too much management attention and was even a completely different sort of business with far lower margins than the pharmaceutical business, so that they finally lost their interest in diagnostics and came up with the decision to refocus on what they were really good at – biotechnology.

Organizational integration

The organizational integration of Chiron Diagnostics was carried out for each segment (NAD, Immunodiagnostics, Point-of-Care) in a different way. But, before focusing on the integration of the different segments a few other things such as the organization of the first layer of management needed to be done. After that, the turn was at the three segments of Chiron Diagnostics. In order to realize this they were putting teams together in all segments, regions, disciplines and functions which closely worked together. Although it was Bayer Diagnostics who acquired Chiron Diagnostics there was no predominance from the part of Bayer during the integration process. The merger was rather carried out as a

'merger of equals' than a straightforward acquisition with a dominance from the part of Bayer. As far as the organizational integration of the three segments is concerned, it quickly became quite clear that each of these segments needed to be handled in a different way.

First, there was the decision about the integration of the Immunodiagnostics, segment located in Walpole, MA. It was quite obvious that these activities would be put together very quickly due to the fact that Bayer and Chiron Diagnostics complemented each other especially well in this respective field. On the immunoassay side the instruments were complementary as well as the market focus, and the applied technologies were quite similar. In this segment, Tarrytown, NY, the headquarter of Bayer Diagnostics, was chosen as the headquarter, and two plants had to be closed. As far as the manufacturing in the critical care segment was concerned the manufacturing activities were transferred from the Chiron plant in Medfield, MA, to the former Chiron facility in Sudbury, England, whereas in the field of the automated lab testing instruments the Bayer plant in Oberlin, OH, was closed and the manufacturing was transferred to Chiron's manufacturing site in Walpole, MA. Apart from that, Bayer sold its facility in Middletown, VA, with the possibility of continuing a Bayer supply agreement for reagents. This plant has manufactured chemistry, immunodiagnostics and hematology reagents, most of which is after the acquisition produced in the Walpole, MA, site. Furthermore, there was also a very good cultural fit between these two parts, which facilitated and enabled such a quick integration, because this site was dominated by the former Ciba-Corning people and not by the Chiron people. After the successful integration of these two parts the company now has about 40 immuno acid test systems in the areas of fertility, thyroid function, oncology, cardiology, anemia, therapeutic drug monitoring, bone metabolism and allergy – all under one roof.

Second, the decision about how to integrate the Point-of-Care business segment, which included the blood gas electrolytes from Chiron and the urine chemistry from Bayer, took a little bit longer. One manufacturing facility was located in the Boston Area and the other one in Indiana. At the beginning, it was decided that the activities of both sides should not be combined. Then, after some time, the management in the headquarter at Tarrytown felt that these activities could also be combined, because of some perceived synergies, both of them being about the

same size and a duplication of management. The responsibility for this business segment, which was also part of the former Ciba-Corning piece of Chiron Diagnostics, and, by this, also very close to the culture at Bayer Diagnostics, lays now in the hands of a former Chiron-Executive. The Chiron site in Boston has been chosen as the headquarter for this segment.

Third, there was the Nucleic Acid Diagnostics (NAD) segment, located in Emeryville, CA, in the Bay Area which was the former Chiron, pure biotechnology driven part and, hence, quite different from the rest of the company. They kept the same boss as they had before the merger. Bayer Diagnostics' Headquarter decided not to really interfere in the day-to-day business and, by this, not trying to tell them how to run that part. It was decided to leave the NAD business alone, as it is until today. Considered from the point of view of the main business areas of Bayer Diagnostics they have a 'complete different life cycle in business'. This business is still very research-orientated, and is still very heavily influenced by the biotechnology part. Moreover, sales have just begun to grow from a very low basis. These people are indeed some kind of a little group by themselves. In the two other segments there is no longer the talk about 'I am from the Bayer side and you are from the Chiron side'. However, this small group is quite different and much more difficult to integrate as they are (1) not in the same area and (2) have a completely different culture than the rest of the company due to the fact that they represent the original Chiron culture which is much more Californian, biotech- and research-orientated, and has nothing in common with the traditional diagnostics business. The only thing that has been transferred from that part was the manufacturing from Emeryville, CA, to Walpole, MA, but no R&D, especially core technologies.

After the integration – irrespective of what approach was chosen – each of the three segments has been completely integrated in the strategy-making process as it is the case with each other segment of Bayer. The company is run from the headquarter in Tarrytown, NY, by the President of Bayer Diagnostics, Rolf Classon. Most of the people reporting to Mr. Classon are located in Tarrytown, but some are also in different locations, as it is e.g. the case for the NAD-Business in California. From a financial, business reporting point of view every segment is treated alike. They all come to the same business meetings and they all have the same reporting systems. Nevertheless, the NAD-segment is granted

much more freedom on the day-to-day management, as well as on the operational part of the business and, to some extent, also in the decisions about strategic directions. As far as the IT infrastructure was concerned there had been some difficulties at the beginning, so that for a certain period of time both systems, from Bayer and Chiron, were kept parallel before they were finally integrated. After some adaptations and a few alignments these problems could be solved quite well. This was also supported by sending experts in reporting and the IT infrastructure from Bayer Diagnostic's headquarter in Tarrytown to the respective segments in order to make the staff there familiar with the systems in use.

Bayer Diagnostics expected that it would not be difficult to relocate some people in R&D from Walpole to Tarrytown. However, they made the experience that people prefer to stay in the same area. They have known that people do not like to move from the West Coast to the East Coast – and, in fact, never do that, so nobody from Emeryville, CA, has even been asked to – but they had been surprised that people were reluctant in moving from Boston to Tarrytown. Finally, they came up with the conclusion that such a decision was easy for them to make, because, in a booming economy in a booming area as the Boston area, it is not very difficult to find a new job.

This relocation of people must also be considered in close connection with the transfer of knowledge, because the major part of the knowledge transfer was supposed to take place by consolidating the R&D activities. All in all, they got most of the knowledge they wanted to get. The biggest issue was that they lost a few key people. Apart from that, the transfer of knowledge was only limited to two of the three segments, the Immunodiagnostics and the Point-of-Care business. As far as the NAD business was concerned there was no knowledge transfer from Chiron to Bayer, because this knowledge is very specific and Bayer was not familiar with that kind of technology. The only thing – as already mentioned before – that has been transferred from Emeryville, CA, to Walpole, MA, were the manufacturing activities for NAD products. Thus, Emeryville will continue to be the home for Bayer's NAD segment and its marketing, business development and R&D activities.

During the merger Bayer did not have to lay off people. One reason for that was that there was a natural rate in terms of staff turnover and Bayer reacted by

holding back with new recruitment and replacements when people left. Moreover, some people left the company as already indicated in the paragraph above because of the planned relocation and some were offered good jobs by headhunters. Furthermore, Bayer had the best productivity ratio in the diagnostics business, whereas Chiron had a higher people to sales ratio. So, it was a good opportunity for Bayer to take a medium. Moreover, Bayer wanted also to keep Chiron's senior management and top scientists with key knowledge in the company. In order to realize this these persons were offered some incentives in terms of bonuses, operational and financial support. One of the most crucial issues were stock options, because Chiron offered stock option programs, whereas Bayer did not. As a consequence of this, Bayer needed to offer very good packages in terms of salary and bonuses. In addition, they also paid some money in order to bridge the gap of financial losses people were facing when forced to exercise their stock options. The Management at Bayer Diagnostics was aware of the fact that stock options are part of the whole business process and culture in the U.S., making such an acquisition more difficult for them compared to some of their competitors, as such stock option programs were missing.

Organization of the integration process

Another major topic is how the organizational integration process itself was carried out. After the announcement of the acquisition a steering committee was established by Rolf Classon, the President of Bayer Diagnostics, that included Mr. Classon, some other executives from Bayer Diagnostics and from Leverkusen, as well as from Chiron Diagnostics. The steering committee, which comprised three people from Bayer and three people from Chiron, put a senior person in charge of the integration process, who acted as a full-time integration manager and reported directly to this committee. This person was the former Senior Vice President Finance of Bayer Diagnostics and the number 'two' behind the President. The integration process itself was carried out by 20 integration teams which delivered monthly reports to the integration manager. These teams which corresponded to the different functions and segments made recommendations either to the integration manager or directly to the steering committee. Then, the steering committee made the necessary decisions. Each of these teams was co-headed by one person from Bayer and one person from Chiron.

Apart from that, the integration process, whose two major tasks were (1) to ensure a smooth organizational integration and (2) to realize the planned synergies, was supported by a few outside consultants. One of them was focusing on the problems related to Human Resources issues, one was responsible for the communication and one was in charge of realizing the cost savings. The cost synergies were estimated at $120 million per annum by the year 2001. In order to realize this they brought in external consultants using a special tool and focusing on each specific cost synergy separately which then was assigned to the responsibility of one consultant. By this, the process was formalized in terms of clarity, objective and responsibility. Bayer is also on target with the realization of its costs synergies. Nevertheless, on the sales side e.g. it was much more difficult, because these synergies depend more on customers, competitors and the way people have been integrated, whereas costs synergies are more or less only an internal issue that can be controlled easier.

Even if Bayer Diagnostics was double the size of Chiron in terms of sales and approximately also of people, the integration process was managed more like a merger of equals. In order to build-up and foster the common spirit between the two merging parts, a new vision was developed which was granted a lot of time and effort. The major aspect of this vision was that it was developed bottom-up by both parts in a common effort. By this, it was considered as being the first, common and successful project, which created the new and future vision, mission and values of the company developed by all employees.

Bayer Diagnostics was following two basic rules or, in other words, guiding principles while carrying out the process of integration. *First,* speed in terms of decision-making was considered as a very crucial issue, meaning that employees were informed as soon as possible whether they kept their job, what kind of job this was and where this job was to be located. Because, if people are worried about their jobs, they are not focusing on customer service, instead, they are only focusing on the inside. Hence, the top 100 positions of the company were filed within 75 days and 80% of the organizational integration was done in four months. *Second,* communication was the other important point, internally as well as externally. Bayer had to communicate very quickly how the integration was supposed to take place and what the strategy was going to be, so that, on the one hand, employees knew and were convinced about what they were doing and, on

the other hand, existing as well as potential customers were very quickly aware about what the new company intends to do and how the new company looks like. Internally, there were two kinds of communication, the first one took place during general meetings in which Mr. Classon, the President, informed about the overall development of the integration process and the second one, which was considered more important, was the early personal face-to-face communication between the employees and their respective superiors in order to inform the people about their future tasks and position within the newly created company.

As far as lessons learned or major problems were concerned, one subject to mention is that there was a product of Chiron which was about to be launched, but which was not ready yet, meaning technically robust enough for the market. Consequently, the product had to be withdrawn and it took twelve months to get everything fixed, which revealed Bayer that it is difficult to make projections during the Due Diligence process about a product in an area with which they were not 100% familiar. In the NAD business they acted more carefully and brought in some outside consultants. A few other problems occurred in the sales area. There, they made a few changes, relocated and refocused some sales people too early and underestimated the transfer of their respective expertise. Moreover, during the integration process the company was targeted by its competitors, because this integration period was regarded by them as a typical time of disruption, insecurity and insight focus.

Although communication was considered as one of the most crucial issues and also a lot of communication was done during the first six months, it could have been better, because, after these first months it slowed down a bit and people on lower levels still waited for information about their future within the newly created company. Moreover, Bayer did not expect the problems in terms of relocation. In this case, earlier interviews and reactions from people to be relocated could have improved this process. Nevertheless, the overall evaluation from the Bayer-side was that it went as smooth as it could and that they achieved almost 90% of what they had set up in the beginning.

3.5.2 Within-case analysis

As already mentioned at the beginning of this case, the acquisition of Chiron's Diagnostics business by Bayer Diagnostics is a little bit different compared with the other cases. The integration and acquisition of Chiron's biotechnology business is only a particular part and most of the deal is about the more 'traditional' former Ciba-Corning Diagnostics. The Emeryville, biotechnology piece of Chiron Diagnostics only makes up about 10% of the company. Taking into account that Chiron Diagnostics employed approximately 3,300 employees and that 10% of these employees were coming from the Californian, biotechnology-driven part, it is just a question of using the right expression and to speak about the integration – not of a small biotechnology company – but about the integration of a small biotechnology 'part'. Hence, this does not differ from the other cases. It is just another way of looking at it. This point of view is also supported by the fact that the three parts of what was former Chiron Diagnostics are treated in a more or less completely different way, as far as their basic integration strategy is concerned. Thus, the special analytical focus of the following section will be put on the integration activities concerning the biotechnology business. Of course, the integration of the two other parts will also be depicted along with that and will provide an added value by a supplementary perspective.

The case description revealed four motives for the acquisition of Chiron Diagnostics by Bayer Diagnostics: (1) getting a critical mass, (2) broadening the customer base, (3) cost savings of about $120 million and (4) getting access to new, valuable technologies in a very promising and fast expanding segment, the NAD business. At a first glance, it may appear that these are four single motives. However, there is also another possible way of summarizing these motives by combining the first three motives together to one major motive and leaving the fourth motive as the second major motive.

On the one hand, the first three motives combined can be considered as being a kind of 'operational' rather short-term orientated motive, because they aim at improving and fostering the current position of the company by reacting to the consolidation process in the diagnostics industry, getting access to new customers for products that were coming along, increasing efficiency and reducing

manufacturing costs. On the other hand, the NAD business did not promise any kind of short-time benefits. On the contrary, this business is still in the research phase, which means that it needs a lot of money, and has only very little sales. This was also quite clear to the managers at Bayer Diagnostics, who were aware of the fact that the NAD business has a completely different life cycle. But, the NAD business is considered as a fast expanding and very promising field of the future. Thus, the acquisition of the NAD business can be regarded as a 'strategic', rather long-term orientated motive in order to ensure the future survival and growth of the company. To sum up, the acquisition of the 'traditional' diagnostics business was primarily intended to improve the short-term position of the company, whereas the acquisition of the biotechnology part which provided access to new valuable technologies was to contribute to the long-term growth and survival of the company.

Having analyzed the two major motives for the acquisition the question now arises how the integration and collaboration between the two companies were organized in order to meet the requirements for realizing these motives. The first step, before any kind of further organizational integration activities was put in place, was the integration of the first layer of management in each of the three segments. In each segment a few of the top-tier management people left, but this was made clear from the very beginning, so that with the remaining top management the organizational integration process could be planned and set in place.

The organizational integration was carried out for each segment in a different way, so that considered from the point of view of a basic integration strategy, different integration strategies applied. For the first segment, Immunodiagnostics, it was decided that there was an immediate integration, or in other words, a combination of the former Chiron part into/with Bayer Diagnostics, because there was a perfect fit as far as markets, technologies and the culture of the people were concerned. As a consequence of this, two plants had to be closed, some activities needed to be transferred and Tarrytown was chosen as the headquarter for this segment. This kind of integration strategy implies a full consolidation of the operations and culture, because there is no need for organizational autonomy. Instead, a high degree of interdependence is needed in order to realize the planned synergies.

The ultimate decision about the second segment, the Point-of-Care business, took a little bit longer. It was clear from day one that there were natural synergies between the blood gas electrolytes business of Chiron and the urine chemistry business of Bayer. However, in the very beginning it was not clear how to combine those two parts. Thus, they first started with a preservation approach and let each of the company's parts run separately. After that, the two parts were combined successfully by transferring management and manufacturing tasks to the segment's new headquarter at Walpole.

The third segment, the NAD business, located in Emeryville, CA, which is the former Chiron, pure biotechnology driven part and, hence, the main subject of interest of this study received a special treatment. This part was – at least up to a certain extent – not to be integrated. This decision was made, because this part was in all regards quite different from the rest of the company as it has a completely different business life cycle, is still very research-orientated and heavily influenced by biotechnology. Indeed, this segment operates with a very high degree of autonomy and independence. Besides the fact that a few executives left, they kept the same boss as they had before the merger and the full responsibility for the NAD business was also left in their hands. There is no real interference in the day-to-day business of this segment, meaning that they were granted the maximum of possible autonomy.

Keeping the fundamental difference of the applied integration strategies in mind, it is now necessary to have a closer look at how the different organizational elements were combined. From a strategy-making and reporting point of view all segments were treated alike. They have been all completely integrated in the overall strategy-making process of Bayer Diagnostics, which in turn is integrated in the long-term strategy of the Bayer Group. This implies, that all respective executives of each segment must attend the same business meetings in which the future strategy of Bayer Diagnostics is shaped. To a certain extent, the NAD segment is granted a little bit more freedom, because the headquarter is not completely familiar with all the specific biotechnology know-how needed to make detailed decisions. So, compared to the other segments they have a bigger leeway, but nevertheless, need to make the necessary reporting and presentations in the strategy meetings. This freedom in strategic decision-making is particularly granted in the area of R&D, whereas the few manufacturing activities have been

transferred to Walpole. Thus, there is a clear cut in responsibility between the early stages of the value chain and the latest ones.

As far as the reporting systems and the integration of the IT infrastructure were concerned a few problems occurred in the first step, because these systems were different and tailored specifically to the needs of each company. But, after some adaptations and a few alignments these problems could be solved quite well by sending experts from Bayer Diagnostic's headquarter in Tarrytown to the respective segments in order to make the staff there familiar with the systems in use. It is worth pointing out that people from the acquired segments did not need to come to Tarrytown in order to get trained there and afterwards return to their sites, where they then would have been on their own. Instead, trained and experienced people from the headquarter went to the different sites and locally trained and helped the people at the face of the new systems. To sum up, the central responsibility and ultimate decision-making for finance, IT and strategy over all segments lay in the hands of the headquarter in Tarrytown. However, the NAD segment has been granted some special freedom in its R&D activities.

One of the most frequent cited issues in the context of mergers and acquisitions and especially in close connection with everything that has to do with biotechnology is the acquisition, access and transfers of knowledge. Analyzing the case study from this perspective, the consolidation of R&D activities and, by this, also the transfers of the respective knowledge into a common unit only took place in the first two segments, the Immunodiagnostics and Point-of-Care segment, but not – as one might have expected – in the biotechnology-driven, NAD-segment with its special knowledge. Remembering that with the acquisition of the NAD business, Bayer wanted to get access to new, valuable technologies in a fast-expanding and very promising field, it is indeed very surprising that they did not intend to transfer that knowledge. Instead, they even granted the NAD segment the maximum of possible autonomy.

The reason and explanation for this obvious contradiction is much easier than it appears at a first glance. This business which only has small sales is still dominated by research connected with very specific know-how and knowledge embedded in the people working at the Emeryville site, which represent also a particular group of people very different from the rest of the company. Hence,

there is a very special knowledge created by a particular group of people, both of which are very different from the rest of the company. The logic question which comes up is: What to do with that knowledge and these people? The answer is nothing easier than that: keep the knowledge and the people where they are, do not try to transfer the knowledge or even to move the people and, by this, trying to transfer part of the knowledge. That was also the decision Bayer Diagnostics made, they decided neither to transfer the knowledge nor the people. They were quite well aware of the fact that this knowledge was very specific and very special and that nobody and nowhere else in the company somebody could make use of it except the people in Emeryville. Thus, they made the only reasonable decision they could do: they granted the NAD business as much autonomy as possible.

The following paragraph will also support this explanation by emphasizing again the difference in culture and, thus, the difference in people. Nevertheless, a little transfer took place, which was the transfer of the manufacturing activities. But, this did not affect the specific knowledge in biotechnology. This makes also clear why the NAD business is granted much more freedom in the strategic decision-making as far as R&D is concerned; that is their playground whereas 'traditional' manufacturing is rather a core competence of companies being already longer in the business and covering the whole value chain for years such as the former Ciba-Corning Diagnostics or Bayer Diagnostics.

The above paragraph has tried to give a first explanation for the chosen integration strategy of the NAD business and the decision not to transfer any knowledge from them. From a cultural point of view there are also some points which need to be mentioned in this context and which support this explanation as well. It is quite evident, that already within Chiron Diagnostics two different kinds of cultures existed. On the one hand, 90% was the former Ciba-Corning piece of what was formerly Chiron Diagnostics. This culture was shaped – considered from a company cultural point of view – (1) by a traditional diagnostics type of culture, because Ciba as well as Corning have already been in the diagnostics business for decades and – regarded from a regional point of view – (2) by a north-east coast culture. On the other hand, 10% of Chiron Diagnostics' culture was influenced by (1) a biotech, research-driven and entrepreneurial kind of culture as far as the company culture is concerned due to

the fact that this part came originally from the biotechnology mother company Chiron, and (2) by a Californian, west-coast kind of culture because this segment was located in Emeryville. As far as the integration and collaboration of the 90% of Chiron Diagnostics was concerned, there have been few cultural problems, because both companies were working in the same business and they were even located in the same region. In addition to that, these 90% even appreciated the merger with Bayer Diagnostics, as they were coming back to a diagnostics company from a biotechnology company, which in their opinion never really understood and supported them very well.

In a big contrast to that, the cultural gap between Bayer Diagnostics and the Ex-Chiron part of Chiron Diagnostics was enormous. Looking at this from a different perspective this cultural gap was even already present in Chiron Diagnostics before its acquisition by Bayer. Before the acquisition, it was the biotech, Californian culture that played a dominant role, because the mother company, Chiron, was a biotechnology company. However, both sides acted independently and preserved their respective culture. After the acquisition there was only a change in the cultural dominance, because now the mother company, Bayer Diagnostics, was a more ‘traditional’ diagnostics company. The situation per se did not change, both sides still act on their own and preserve their respective culture.

The last paragraph has discussed the importance of a different perception in terms of company and regional culture by the people involved, so that this paragraph analyzes how people reacted and were treated during the integration. Nobody would deny that people are among the most difficult and important issue to deal with. Hence, the first thing made before any kind of integration activities were started, was the decision about the first layer of management, because it needed to make clear who will stay in the company and who will not, because, as a result of such a M&A deal, there is always an increase in fluctuation. This also happened in the deal between Bayer Diagnostics and Chiron Diagnostics. This very first step is absolutely necessary, because the organization of a reasonable and reliable integration strategy needs to build upon the available executives. Only they are considered as trustworthy persons, because they are also going to stay in the newly created company. Consequently, there are two major questions

that need to be taken into account: (1) why do people leave and (2) how can this be prevented.

In the case of the Bayer-Chiron integration, there was a normal fluctuation at the top, because some of these people did not feel comfortable in the new company and, in addition, were offered very good jobs by headhunters. As a consequence of this, they could not be persuaded to stay within the company. However, it was very important to determine in a very first step who was going to stay and who was going to leave. Moreover, some people, especially those in R&D of the Immunodiagnostics business, were supposed to be relocated from Walpole to Tarrytown. The management at Bayer expected that the relocation would not cause severe problem, because the company culture as well as the regional culture were quite similar. Instead, the management at Bayer had to realize that it was a big deal for these R&D people to move from Walpole to Tarrytown. They did not want to do that, because they preferred to stay in the Boston area. Consequently, those people decided to leave the company, a decision easy for them to make, because it is not difficult for highly trained people to find a new job in a booming area as Boston and particularly in times of a booming economy as it was at that time. In contrast to this unexpected and unhappy surprise, the management at Bayer Diagnostics was aware of the fact that people mostly refuse to move from the west to the east coast. They prefer to stay in the Bay area and would rather look for a new job there than move to the east coast. Additionally, there was also the big cultural gap between the biotechnology part in California and the rest of the company. This made the management in Tarrytown not even ask people from Emeryville, if they accepted a relocation. Besides the fact that some of the top management left, the rest of the company's employees, mainly research staff, stayed with the company, because for them not so many things changed and they could still do the research they had already done before.

Another very important issue which made some people leave was the lack of a stock option program. Chiron Corp., the mother company of Chiron Diagnostics, offered a stock option program, whereas Bayer did not. This bears two important consequences. One, all employees of Chiron Diagnostics who participated in this program needed to exercise their options as they were leaving the company since the participation in such a program is linked to the 'membership' in that company. The need to early exercise their options meant that people lost money.

Two, Bayer has no stock option program which made it be a less attractive employer and thus made people leave the company.

After having analyzed the reasons why people left the company after the merger, there is now a clear need to state what Bayer Diagnostics did in order to prevent the staff from leaving. As far as the first problem, the need for the early exercise of stock options, was concerned, Bayer Diagnostics offered some payments and bonuses in order to bridge the gap of financial losses and, by this, trying to reduce that problem. The second problem, the missing of a stock option program could not be solved. The management at Bayer Diagnostics was aware of the fact that stock options are a very important part of the U.S. culture. But this can not be solved satisfactory from their part, as the mother company, the German Bayer Group, does not offer such programs. Hence, this is a problem they have to life and cope with. In order to do make up for the loss of the stock options Bayer Diagnostics offers very good packages in terms of salary and bonuses. Apart from that, Bayer of course also wanted to keep some of the senior management and top scientists with key knowledge in the company. They were offered special incentives in terms of bonuses and other operational and financial support, especially for those who lost money by exercising their stock options or who needed to be relocated.

After having discussed and analyzed the different elements that needed to be integrated it is now necessary to have a closer look at how the integration itself was organized and carried out. To start with, one of the first things that needed to be clarified were the questions of responsibility and support. The decision for the acquisition of Chiron Diagnostics was part of the overall strategic planning of the Bayer Group and, by this, was also approved and supported by the Board in Leverkusen. Hence, there was a clear support from the very top of the group. This decision provides the general framework and setting in which the acquisition and subsequent integration was placed. The more specific implementation of the integration process was carried out by Bayer Diagnostics itself which set a special structure in place. After the announcement of the acquisition a steering committee was established by the President of Bayer Diagnostics. This committee comprised three people from Bayer Diagnostics including a person coming from Leverkusen, which again emphasizes the overall support from the group’s headquarter, and three people from Chiron Diagnostics. After that, this committee

under the direction of Mr. Classon, the President of Bayer Diagnostics, put a full-time integration manager in charge of the whole process, who reported directly to the steering committee. This implies that there was full support for this acquisition and integration as the responsibility for the integration laid in the hands of the top management of Bayer Diagnostics, the president as the leader of the steering committee and his former Senior Vice President Finance as a full-time integration manager. Furthermore, there was even the support from the Group's headquarter, which was sending one person to the steering committee. All in all, there were clear responsibilities for the process and also strong support from the top.

The integration process itself was carried out by 20 integration teams who corresponded to the different functions and segments. Each of these teams was co-headed by one person from Bayer and one from Chiron, revealing the spirit of the 'merger of equals'. These teams made monthly reports as well as recommendations either to the integration manager or directly to the steering committee. This process was also supported by outside consultants in the areas of human resources, communications and cost synergy issues. E.g., the responsibility for a specific cost synergy was assigned to one consultant who was responsible for its realization and directed this process.

During the integration process two fundamental rules, or guiding principles, were followed: speed and communication. Speed was especially necessary for determining the future filing of top positions of the company, i.e. for the first and second layer of management in order to have at least some people the integration process can be built upon. After that, every position was to be filed from top to down, step by step, and everybody in the company was to be informed as soon as possible about his future, by a face-to-face conversation with his respective superior. This also leads up to the second important topic, communication. Communication was supposed to take place on two different levels. The first one was the general communication given in speeches of the President or any other person from the top management. The second, more important kind of communication, was the early face-to-face communication between the employees and their respective superiors. For the upper levels of employees this was done quite well, whereas for the lower levels it sometimes took even more than six months, before they had been informed about their future within the

company, which was definitely too long. In this case, speed and communication were not only two fundamental rules or guiding principles, but they must rather be considered as having been two integration pillars on which the successful integration was built upon.

Looking back at major difficulties Bayer Diagnostics were facing during the M&A process there is just one further major point which needs to be mentioned besides the communication problems discussed in the previous paragraph. Before the acquisition, Chiron Diagnostics was supposed to have a product which was about to be launched and which was also analyzed during the Due Diligence process. However, after the deal was done it turned out that this product was not truly ready for the market and needed to be withdrawn in order to get fixed. This shows that one only gets to know the new products and technology after the deal is done. From this it follows, that a Due Diligence process needs to be carried out very carefully and that it is sometimes even better to bring in outside consultants as Bayer e.g. did in the NAD segment.

3.6 Cross-case analyses and building a set of tentative hypotheses

After having analyzed each respective case on its own using case description and within-case analysis, this final section of the case study chapter turns to the comparative analysis of the five case studies of organizational integration and collaboration after the M&A deal. The analytical focus will be on the detection of commonalities or differences concerning (1) acquisition motives, (2) realization of the organizational integration according to the different integration topics of organizational/structural integration, knowledge/competence integration and transfer, cultural integration as well as personnel integration, and (3) the organization of the integration process itself. Finally, this section and, indeed, the entire case study chapter, is devoted to shaping a set of tentative hypotheses. These tentative hypotheses constitute the basis for an extensive unfolding of the literature in the next chapter, leading to a creation of a new integration framework – the ultimate aim of this study.

However, before starting to shape these tentative hypotheses one may ask the question whether the five case studies discussed so far can serve as the basis for generalizing the findings. Certainly not, since the problem remains that the sample consisted of only five cases. However, the point is that generalization should not be the goal for a case-based study at all, because sample size are almost too small for claiming that findings can be generalized.[40] It is the big advantage of case-based studies that their are able to generate rich narrations (stories) and analyses in order to develop grounded hypotheses and theory extension. Still, the issue of external validity is of course not irrelevant for case study research. Thus, an increase in sample size and a replication of findings across a higher number of units of analyses makes such findings more robust. Because resource restraints prohibit the execution of large sample case studies, Leonard-Barton (1990) recommends the use of ‘replicated multiple sites’ in order to overcome the problem of external validity. By this, the findings of a case study approach based on one or more in-depth cases can be corroborated by the use of supporting evidence from additional ‘mini-cases’. In the context of this study,

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[40] This issue has also already been addressed in Chapter 2.

Leonard-Barton's (1990) advice is followed by presenting several brief examples of post-acquisition integration activities of high-technology companies.

Mini-case 1: Cisco Systems and its acquisition management

Cisco Systems, Inc., founded 1984 by a group of computer scientist from Stanford University, is the worldwide leader in networking for the Internet and provides the broadest line of solutions for transporting data.[41] In fiscal year 2001 (ending 7/31/2001) the company accounted revenues of $22.2 billion and had over 38,000 employees worldwide. Cisco has frequently used acquisitions to obtain new technologies as well as know-how embodied in people and, thus, has completed more than 65 acquisitions between 1993 and 2000. This reflects the underlying growth strategy that whatever research and development its engineers cannot create in-house, it buys. The company prefers to focus on smaller firms that excel in specific technological areas, so that the deal amounts typically range from $40 million to $450 million.

Throughout the acquisition process, Cisco constantly screens the target against five principles it needs to fulfill: (1) presence of a shared vision, (2) likelihood of a short-term win for both the acquired company and Cisco, (3) long-term win for all parties, (4) right chemistry or cultural compatibility, and (5) reasonable geographic proximity, which means Silicon Valley, the Research Triangle in North Carolina and the Route 128 corridor outside Boston. Cisco tries to create value by combining the technical expertise of target companies with its own marketing, distribution and manufacturing expertise. Obviously, Cisco is buying resources that are based on highly tacit and rare technological knowledge embedded in organizational routines and people's know-how – like the knowledge in biotechnology companies. Because of this, the technical teams of acquired companies are often left unchanged in terms of composition, people they report to and projects they work on. Usually, the technical and sales organizations of the acquired company become a business unit within one of Cisco's line of businesses. Although Cisco aims at transforming the target company employees

[41] This 'mini-case' is based on information from http://www.cisco.com as well as O'Reilly & Pfeffer (2000), Inkpen, Sundaram & Rockwood (2000), Singh & Zollo (2000), Goldblatt (1999), Drexhage (1998), Daly (1999), Holson (1998), Nee (1996) and Plotkin (1997).

into '100 per cent Cisco employess', the company is careful not to change things that may disrupt the productive functioning of research and development teams. This clearly shows that the R&D area is granted a high degree of autonomy whereas the target's manufacturing, finance, sales, and distribution activities are centralized. Moreover, Cisco tries to ensure that top people in the target firm are given key positions in the new organizations in order to make them stay. Moreover, Cisco continues to give stock options to an acquired company in order to retain the staff.

Cisco believes in early, honest and clear communication to employees in the target company about their roles in the merged organization. Apart from that, Cisco also believes in fast integration and tries to integrate an acquired company usually within 100 days. The integration itself is carried out by integration teams, which are composed of Cisco employees and members of the new unit. These teams ensure that the management information and communication infrastructure of the target company is matched with the systems at Cisco. Besides this, these teams hold orientation sessions in order to explain Cisco's values. Moreover, special orientation sessions involve employees from previously acquired companies who offer their insights, as well as change management sessions to assist the people within the acquired firm in supporting the transition. Cisco measures the success of every acquisition first by employee retention, then by new product development, and finally by return on investment.

Mini-case 2: The post-acquisition integration of Agouron Pharmaceuticals

Agouron Pharmaceuticals, a biotechnology company founded in 1984 and located in La Jolla, California, working in the areas of AIDS and Cancer, was acquired in May 1999 by Warner-Lambert in a deal worth $2.1 billion.[42] Six months later, Pfizer staged a $92 billion hostile takeover of Warner-Lambert, which created the world's largest pharmaceutical company. Although, Agouron had brought a drug to the market (*Viracept*, an HIV protease inhibitor) that generated hundreds of

[42] This 'mini-case' is based on information from Copeland (2001) and Goldman Sachs (2000).

million of dollars in annual sales each year, it was not enough to sustain the long-term and expensive development of a new blockbuster. Short of cash, Agouron was looking for a buyer. By acquiring Agouron, Warner-Lambert (and subsequently of course also Pfizer) gained an immediate presence in Agouron's specialities, antiviral and oncology research, something that Warner-Lambert lacked. The deal also gave Warner-Lambert access to Agouron's extensive library of chemical compounds as well as *Viracept*. After the acquisition, there was a modest restructuring that involved the elimination of Agouron's treasury and investor-relations departments. Furthermore, Warner-Lambert took over the purchasing as well as the manufacturing of *Viracept*, which Agouron had outsourced. But beyond that, not much changed. Agouron was essentially left alone to do its job and also kept its name. Agouron's scientist received a significant increase in their R&D budget, but were not forced to adopt the way of the larger pharmaceutical company. Instead, they were left independent. Only, Agouron's two top manages reported to the parent company. Apart from that, it was also decided that Agouron should take the lead in the areas of antiviral and oncology research, because even though it was smaller than the parent company, it had more expertise in these areas. Thus, Agouron was designated by Warner-Lambert as a center of excellence for oncology and antiviral research. Besides, Warner-Lambert also never intended to move Agouron or some of its employees to the Midwest, because they were aware of the fact, that people would leave the company in this case. Nevertheless, the collaboration between the acquired biotechnology company and Warner-Lambert's scientist turned out to be very difficult, because the culture of both companies was so different. The people at Agouron were viewed as 'those guys out in San Diego'.

In November 1999, after the first integration was done, Agouron received the news that Pfizer had mounted a hostile takeover to prevent Warner-Lambert from completing a planned merger with American Home Products. With this acquisition it was clear that Agouron's days of complete freedom were ending as Pfizer announced from the beginning that it would not take the same kind of hands-off approach that Warner-Lambert had used with Agouron. Less than one year after the merger was closed, Pfizer has imposed new financial, marketing, and research controls on Agouron. In practice, losing that autonomy meant that several layers of Pfizer Management would now be involved in decision making,

because Pfizer likes to have central command and control, which often leads to some delays. That is a fact, people at Agouron are constantly complaining about because they have a much more biotech-orientated mind-set in which speed is the only thing that is important. However, large pharmaceutical companies like Pfizer have the luxury of time as they have much deeper R&D resources. People at Agouron had to realize that there is no such thing as complete freedom and autonomy when being part of a large corporation. Agouron is now considered as one of Pfizer's four major R&D centers with an R&D budget of $300 million in 2001. Moreover, Agouron gets access to Pfizer's high-speed technology for drug screening and its vast genomic databases. The day-to-day management of the business lays still in the responsibility of the management at Agouron as Pfizer intends only to intervene when it feels it must. Otherwise, it will simply put its resources at Agouron's disposal. E.g., one intervention area will be marketing, where Pfizer thinks that it has a lot of things to offer. It becomes obvious that there is a certain balance between autonomy and integration, Pfizer hopes to strike with Agouron. However, it is too early to predict the substantive effects of Pfizer's acquisition of Agouron.

Mini-case 3: How GE Capital integrates acquisitions

GE Capital, founded 1933 as a subsidiary of the General Electric Company, has become one of the world largest financial-services organization as a result of dozens of acquisitions. Therefore, the top management at GE Capital perceives the need that executives learn how to manage the integration of an acquired company as a replicable process and not as a onetime-only event.[43] Because of this, GE Capital has been working to make acquisition integration a core capability and a competitive advantage that will enable it to continue its growth in the future. The acquisitions come in different shapes and sizes and range from simple asset purchases without adding people to completely new businesses.

[43] This case study is primarily based on an article of Ashkenas, DeMonaco & Francis (1998).

Based on its various experiences, GE Capital has developed a model for acquisition integration which is also called ‘Wheel of Fortune’ or ‘Pathfinder Model’. This model divides the process into four ‘action stages’, starting with the work that goes on before the acquisition is completed. Each stage consists of two or three sub-processes. Stage one, the pre-acquisition stage, consists of due diligence, negotiation and announcement as well as the closing of the deal. The second stage is called foundation building and comprises the launch of the integration process, the acquisition integration workout and the strategy formulation. Rapid integration, stage three, involves the implementation process as well as course assessment and adjustment. The fourth stage, assimilation, consists of the long-term evaluation and adjustment as well as capitalizing on success. Moreover, each action stage includes several best practices. The ‘Pathfinder Model’ recommends a particular sequence of leveraged actions, but there are of course aspects of every acquisition integration process that are new or unique.

Apart from that, GE Capital has identified and learned four major lessons from its acquisition activities which are of course reflected in the ‘Pathfinder Model’. *First*, acquisition integration is not considered as a discrete phase of a deal and does not begin when the documents are signed. It is rather a process that starts with the due diligence and runs through the ongoing management of the newly acquired company. *Second*, integration management is a full-time job and, thus, needs to be recognized as a distinct business function. In this context the role of designated integration managers evolved who are to build a connective tissue between GE Capital and the new organization. *Third*, decisions about management structure, key roles, reporting relationships, layoffs and restructuring should be made, announced, and implemented as soon as possible. If not, slow changes, uncertainty and anxiety among employees that last for months might start to drain value from the acquisition. *Fourth*, a successful integration combines not only the various technical aspects of the businesses but also the different cultures. The best way to do that is to get people working together quickly, to solve business problems, and to accomplish results that could not have been achieved before.

Mini-case 4: Post-acquisition integration management of small German start-up companies in the information technology sector

This mini-case is based on the findings of a master's thesis (Henninges, 2001), that analyzes the post-acquisition integration activities of three German high-technology Start-up companies (Heyde AG, Brokat Infosystems AG, Bechtle AG) listed at the 'Neuen Markt', the German equivalent to the NASDAQ in the U.S. and the 'Nouveau marché' in France. The analysis includes the post-acquisition integration of acquired small high-technology companies with German as well as U.S. origin.

Henninges (2001) identified two major motives for the acquisition activities of the three companies. First, these companies pursued a growth strategy and, thus, wanted to gain a bigger market share. Second, they also wanted to get access to the specific know-how and the technologies of the target companies. As far as the overall organizational integration strategy was concerned, each of the companies had a different approach. In the case of Brokat the acquired companies were completely absorbed which made Brokat establish a new organizational and personal structure. In contrast to this, companies that were acquired by Bechtle were granted as much autonomy and independence as possible. Nevertheless, financing and controlling as well as logistics are managed and coordinated by Bechtle's headquarter. The overall post-acquisition integration strategy of Heyde was also to keep up the independence and autonomy of the acquired company, which in the context of the study of Henninges (2001) was Atzlinger GmbH. However, in the course of a subsequent reorganization this company was completely integrated into Heyde. The different overall post-acquisition integration strategies must be considered in close connection with the knowledge transfer. In the cases of Brokat and Heyde, there was some kind of systematic knowledge transfer from the acquired to the acquiring company. In contrast to this, there was no real knowledge transfer in the case of Bechtle, because the acquired companies were turned into centers of excellence that provide their knowledge and competencies to all parts of Bechtle.

Although there are some differences in the basic post-acquisition integration strategy, there are still some similarities as far as the handling of major post-acquisition integration topics is concerned. In terms of reporting and controlling mechanisms, all acquired companies had to introduce the systems of the acquiring companies. Apart from that, they also tried to make the management and employees of the acquired companies stay by offering them interesting career perspectives, financial incentives as well as the participation in the existing stock option programs. In order to manage the integration process, all three companies – Heyde, Brokat and Bechtle – established a specific integration structure, i.e. integration teams consisting of top executives from both sides – the acquiring as well as the acquired companies. This also shows the support from the top of the companies. These integration teams took over the responsibility for the efficient management of the post-acquisition integration process. Apart from that, communication, such as written statements or personal talks, was also considered as a very important pillar for a successful management of the integration process. If necessary, these integration teams were supported by external consultants.

These short mini-cases may suffice as supportive evidence that the five in-depth cases of this study about the post-acquisition integration of small biotechnology companies into the structure of large pharmaceutical companies do not just represent idiosyncratic examples taken from a population whose post-acquisition integration strategies generally follow different patterns. Indeed, the motives, the analysis of the different post-acquisition integration topics and the organization of the integration process itself that were discussed in the different case studies are – as shown with the help of the four mini-cases – quite typical. Therefore, this section returns to the cases of this study and tries to summarize the findings of this study's analyses by developing a set of tentative hypotheses.

In each case study about the acquisition of small biotechnology companies by large pharmaceutical companies, several motives have been identified which had led to the acquisition of the biotechnology company by the bigger pharmaceutical and health-care orientated company. As part of the different within-case analyses these motives turned out to be differentiated in short-term and long-term orientated motives in each case.

To start with, as far as Pharmacia is concerned, the acquisition of Sugen contributed to a short-term improvement of Pharmacia's competitive position due to the fact that it could fill its Phase I/II gap as well as it got access to potential blockbusters. Furthermore, the strengthening of its oncology business in the U.S. market and the sustaining of its growth strategy supported the overall long-term strategy and motives of the company.

At Merck, the short-term orientated motives were the access to an interesting technology platform, the existence of two very promising oncology products with a chance of becoming a blockbuster as well as the patent of immunocytokines that Merck needed in order to continue with its own research. The long-term strategic objectives connected with this acquisition were the fostering of Merck's position in the oncology sector as well as a strengthening of its presence in the U.S. pharmaceutical market, similar to Pharmacia, and the access to the Boston research community.

Novartis' short-term interest in acquiring SyStemix and GTI was the hope of getting a blockbuster as both companies had very promising patents. Besides this, Novartis also tried to gain control over SyStemix, because – in contrast to the other cases – it only had acquired a part of SyStemix at the beginning. The overall long-term rationale behind these engagements can be found in the perceived need of being active in the biotechnology sector and, by this, participating in the expected growth of this industry.

At Bayer Diagnostics, the short-term motivation for the acquisition of Chiron Diagnostics, more precisely the acquisition of the major and more traditional diagnostics business, was that it wanted to improve its actual competitive position by reacting to the consolidation process in the industry, getting access to new customers and increasing its efficiency. In addition to that, the acquisition of the NAD business was to contribute to the long-term growth of the company by accessing new valuable technologies. Compared with the other cases, the case of Bayer was special in that the acquisition did not only concern the biotechnology segment, but also included the bigger diagnostics business of Chiron Diagnostics.

Tentative hypothesis # 1: *Pharmaceutical companies acquire biotechnology companies with the short-term orientated motives of improving their current*

competitive position by filling up their R&D pipelines and getting access to new promising products having the potential of becoming a blockbuster.

Tentative hypothesis # 2: *Pharmaceutical companies acquire biotechnology companies with the long-term orientated motives of strengthening their positions in a specific business sector by getting access to new knowledge and technologies, supporting the overall growth strategy of the company and strengthening their presence in the U.S. pharmaceutical market.*

Besides considering the motives of the pharmaceutical company, it is also necessary to have a look at the reasons why the biotechnology companies agreed to the takeover. Sugen accepted the takeover bid of Pharmacia, because it desperately needed money in order to secure the further survival of the company and the continuation of its clinical trials as it could not raise money in the financial markets at that time. In the deal between Merck and Lexigen, the biotech company was also on the search for a potential partner providing money for the clinical trials. SyStemix and GTI appreciated the acquisition, because they received the financial and regulatory support needed in order to carry out their late-stage clinical studies. In the case of Bayer and Chiron, Chiron wanted to get rid of its diagnostics business and refocus its resources.

Tentative hypothesis # 3: *Biotechnology companies accept the takeover bid of pharmaceutical companies, because they need financial and regulatory support in order to finish their clinical trials.*

As far as the organizational integration is concerned, the different integration elements will be discussed in a first step before the other topics of knowledge/competence transfer, cultural and personnel integration will be compared across the cases.

The overall integration strategy of Pharmacia – as well as in the other cases – was to grant the acquired biotechnology company, here Sugen, as much autonomy and independence as possible. However, the strategic decision-making for Sugen was in the hands of Pharmacia, while Sugen had its freedom on the day-to-day management of its business in which Pharmacia did not interfere. Thus, there is a clear cut in responsibility between the overall strategy and the operational management. In this specific case, the freedom is granted until the clinical trials

are finished due to the fact that Sugen was already far advanced in clinical Phase III. After that, Pharmacia will take over the responsibility for sales and marketing as these are core competencies of a big pharmaceutical company.

A similar handling can be found in the relationship between Merck and Lexigen. The overall strategy was also to grant Lexigen a very high degree of autonomy. In contrast to the other cases, there was, however, a change in the original integration plans after the acquisition became effective. At the beginning, this autonomy was to cover more or less the complete pharmaceutical value chain – which however had never been set in place – and was then reduced to basic research, considering Lexigen more as a center of excellence within Merck. Thus, Lexigen has all freedom in doing basic research and generating promising drug candidates, which are then developed and commercialized by EMD, Merck's pharmaceutical subsidiary in the U.S. This decision was based on the fact that EMD is considered as having more experience than Lexigen with clinical development and bringing a drug to the market. In fact, Lexigen – as well as most other biotechnology companies – has no experience at all in this area.

The same picture also comes up at Novartis and its integration of SyStemix and GTI. The overall strategy is shaped during the meetings of the Research Management Board, in which a representative of both biotechnology companies is part of. The same procedure was also observed in the cases of Merck and Pharmacia. During the integration processes of GTI and SyStemix, two kinds of integration strategies had been in place. For the late-stage, in clinical trials advanced projects there was a full integration, meaning that Novartis tried to gain the control and took over the responsibility for them as these are tasks a big pharmaceutical company sees its competencies in. The second integration strategy was applied to the research functions of both companies, which should retain their complete autonomy and continue to operate at full strength. Hence, the degree of autonomy granted or, in other words, the respective integration strategy in place depended on the position of the project with respect to the pharmaceutical value chain. This position also pre-determines the further collaboration and allocation of responsibility between Novartis and the two biotechnology companies.

In the case of Bayer Diagnostics and Chiron Diagnostics there have been different integration strategies in use depending on the specific segment. As this study is about the integration and collaboration between biotechnology and pharmaceutical companies after the M&A deal, the cross-case analysis of Bayer and Chiron will primarily focus on the biotechnology part of Chiron Diagnostics, the NAD segment. The NAD business was to be granted a very high degree of autonomy and independence in the day-to-day management of its business, because this part is still very research-driven and no product has yet been developed. From a strategy-making point of view all segments were treated alike and were completely integrated in the overall strategy-making process of Bayer Diagnostics, which in turn is integrated in the long-term strategy of the Bayer Group. It becomes obvious that there is also a clear cut in terms of responsibility between the early steps of the value chain focusing on basic research at the NAD-site in Emeryville, CA, and the further developed products of Chiron Diagnostics which have been more or less completely integrated into Bayer Diagnostics.

Tentative hypothesis # 4: *The overall organizational integration strategy of pharmaceutical companies is to grant the acquired biotechnology companies a very high level of independence and autonomy.*

Tentative hypothesis # 5: *The respective organizational integration strategy in place depends on the position of the different biotechnology projects in the pharmaceutical value chain. The more advanced a project is in the pharmaceutical value chain, the more control and responsibility is taken over by the pharmaceutical company.*

Tentative hypothesis # 6: *The decision about when to take over the control of a certain project depends on the perceived core competencies of the pharmaceutical company with respect to the proven and expected competencies of the biotechnology company.*

Tentative hypothesis # 7: *The more competence is expected to be within the biotechnology company, the more autonomy and responsibility will be granted. In the field of research, an acquired biotechnology company is granted a very high level of autonomy.*

The next important issue is to analyze the collaboration between the acquired biotechnology companies and the pharmaceutical companies after the acquisition. The different case analyses revealed that the collaboration between the acquired biotechnology companies and the pharmaceutical companies is carried out by project teams. Furthermore, all case studies made clear that financing, budgeting and reporting are done according to the requirements of the acquiring pharmaceutical companies. This implies, that the specific processes and systems in the acquired biotechnology companies had to be adjusted in accordance with the processes and systems in place at the bigger pharmaceutical companies. The reporting of Sugen to Pharmacia was done directly to a board member at Pharmacia. The financing and controlling mechanisms were adjusted according to the requirements of Pharmacia. In the case of Lexigen and Merck all reporting, controlling, human resources and budgeting decisions are made at and managed by EMD in agreement with Merck. From a financial, reporting and budgeting point of view SyStemix and GTI were directly responsible to the respective board member in Basel. Apart from that, the respective systems and processes of Novartis were set in place at both companies by sending experienced senior managers to both sites. In the relationship between Bayer Diagnostics and Chiron Diagnostics, the central responsibility and ultimate decision-making for finance, IT and strategy for all segments laid in the hands of Bayer Diagnostics' headquarter in Tarrytown. The respective systems and processes had also been transferred from Bayer to Chiron with the help of experienced people from the headquarter going to the different sites and training people locally.

Tentative hypothesis # 8: *The organizational collaboration between the pharmaceutical companies and the acquired biotechnology companies functions on a project base and not by amalgamating the respective units.*

Tentative hypothesis # 9: *After the acquisition, the ultimate responsibility for finance, controlling, human resources and budgeting remains in the big pharmaceutical companies. The necessary processes and systems are transferred from the pharmaceutical company to the acquired biotechnology company by sending experienced managers from the pharmaceutical to the biotechnology company .*

Tentative hypothesis # 10: *The responsibility for the acquired biotechnology company lays in the hands of a board member. The reporting is also done directly to him, mostly on a president-to-president base.*

Another crucial issue in the context of the post-acquisition integration is the transfer of knowledge, capabilities and know-how. However, in the deal of Pharmacia and Sugen – like in the other cases – a general know-how and knowledge transfer did not take place. Some of the projects at Sugen as well as at Pharmacia were stopped and then transferred from one site to the other. In connection with this transfer, people at Pharmacia received information about the transferred genes and targets, necessary for the continuation of their work. Apart from that, a natural, basic exchange of knowledge took place during the collaboration in the different project teams. After the integration, Sugen was rather considered as some kind of center of excellence within Pharmacia, having the necessary expertise in a particular field, not existent in any other part of the company.

A quite similar picture did occur in the collaboration between Merck and Lexigen. Here, there was absolutely no transfer of knowledge from Lexigen to Merck, instead some of the projects at Merck were stopped and then transferred to Lexigen, which was henceforth considered as being a center of excellence within Merck for everything that has to do with biologics. Thus, Lexigen – more or less – plays the same role as Sugen does henceforth. The necessary knowledge for the further development at EMD/Merck will be provided by Knut Sturmhoefel in his function as an interface manager.

During the integration of SyStemix and GTI no systematic transfer of knowledge was carried out and was even never intended. Of course, there was also some basic exchange of knowledge during the presentations held at several meetings or by scientists from Basel being at SyStemix or GTI on job rotation. Both companies – and after the consolidation process only GTI – were considered as a center of excellence for gene therapy and vector technology within Novartis. Another important reason why there was no real transfer of knowledge was the awareness of the fact that the value of this specific knowledge was closely related to the specific sites of the companies stressing the importance of local networks.

Bayer Diagnostics also had never the intention of transferring the knowledge from the NAD segment located in Emeryville, CA, to any other site of Bayer, because they considered this knowledge as very specific and special, embedded in the people working at the site in Emeryville. This point of view is very similar to the attitude observed at Novartis.

Tentative hypothesis # 11: *During the integration process no systematic knowledge, capability or competence transfer in terms of know-how and technology from the biotechnology to the pharmaceutical company is carried out.*

Tentative hypothesis # 12: *After the acquisition, the biotechnology company takes over the role of a center of excellence within the bigger pharmaceutical company – as the knowledge remains within the biotechnology company. Consequently, some of the projects at the pharmaceutical company may even be stopped and transferred to the smaller biotechnology company.*

Tentative hypothesis # 13: *Even after the acquisition, the only way of keeping up the value of the biotechnology know-how is not to transfer it, but to keep it in the site of the local network where it emerged. Thus, no need for relocation of people or functions arises.*

In the acquisition between Pharmacia and Sugen, the management at Pharmacia was aware of the negative impact cultural differences might have and, thus, tried to grant Sugen a very high level of autonomy. Despite this, the acquisition and subsequent integration of Sugen resulted in a fundamental cultural shift from being a high-risk-taking, innovative- and entrepreneurial-driven small biotechnology company to a more research-driven organization with a clear focus on doing good science and identifying promising compounds. A similar trend became obvious in the other cases as well.

In the collaboration between Lexigen and Merck some problems occurred due to country specific, cultural differences like e.g. working in the matrix structure, which did not show up in the other cases. Once detected, these problems could have been solved quite easily. More problems were caused by the cultural differences between big pharma and small biotech, because Lexigen was no longer expected to be the fast acting, highly-dynamic, high-risk-taking and entrepreneurial-driven company. It is now expected to do basic research and

generate promising drug candidates and, by this, Lexigen rather needs a spirit of discovery than an entrepreneurial spirit. After the acquisition, it has become part of a 'bigger' picture and thus needs – at least to a certain extent – to follow the rules of a different game, namely the approach of big pharma. By this, it loses of course some of its former identity. Thus, the development of Lexigen is in no way different from the one observed at Bayer or SyStemix/GTI, which will be depicted in the following paragraphs.

In the collaboration between Novartis, on the on hand, and SyStemix as well as GTI, on the other hand, differences in terms of country culture did not play a major role. However, the gap between big pharma and small biotech had a greater impact. After the acquisition, the management at SyStemix and GTI was no longer expected to take huge risks and act in an entrepreneurial way, because these companies turned into research facilities of Novartis, which were not dominated by an entrepreneurial spirit, but by a spirit of discovery. Novartis, was also aware that such a change would take place. Hence, their goal was never really to keep up the entrepreneurial spirit as it did exist before the acquisition, instead, they rather focused their efforts on the ultimate objective of bringing a drug to the market as quickly as possible.

In the case of Bayer Diagnostics and Chiron Diagnostics, Bayer was also aware of the big cultural gap between Bayer and the biotechnology-driven NAD business segment. Therefore, they decided to apply the respective integration strategy and tried to preserve the independence and autonomy of this segment.

Tentative hypothesis # 14: *Because of the big cultural gap between big pharmaceutical companies, on the one hand, and small biotechnology companies, on the other hand, the pharmaceutical companies try to set an integration strategy in place that grants the biotechnology companies the highest level of independence and autonomy.*

Tentative hypothesis # 15: *Although this independence and overall autonomy strategy is applied in order to preserve the culture of the acquired biotechnology company, the pharmaceutical companies are aware of the fact that the entrepreneurial and high-risk taking spirit of the biotechnology companies will get lost. This will also negatively effect their innovative capability.*

Tentative hypothesis # 16: *After the acquisition, the biotechnology companies develop from entrepreneurial-driven companies into more research and discovery orientated centers of excellence, integrated into the structure of big pharmaceutical companies. This alters the culture of the formerly independent biotechnology companies in a fundamental way.*

After the acquisition of Sugen by Pharmacia, a significant increase in fluctuation was noticeable, which also took place in the other cases. Besides Peter Hirth, who was supposed to manage the integration process, most of the top management left due to the cultural changes discussed in the paragraphs before, but also because of missing stock option programs subsequent to the acquisition. Moreover, the lack of a stock option program resulted in some problems in attracting younger employees, who expect to receive stock options while being employed in a U.S. biotechnology company. In order to make people stay they were offered an increase in salary as well as interesting profit sharing and bonus programs. Some employees at Sugen, especially scientists, also appreciated the job security and the better resources available for doing research that were provided by Pharmacia.

As Lexigen was a very small start-up company with only 27 employees that was not listed on any stock exchange, stock options did not play a role. Moreover, nobody left the company, because they kept the same boss and part of the employees were also bound by specific contracts. As in the other cases, some of the employees at Lexigen appreciated the job security and the better access to resources which were provided by Merck.

After the acquisition of SyStemix and GTI, the whole top management left – besides one or two people. These people were needed in order to ensure a smooth organizational integration of the biotechnology companies into the structure of the big pharmaceutical company by providing some stability and continuity. This could be observed in the other cases as well. To make them stay, they – as well as the key knowledge-holders – were made good offers. As far as the scientists were concerned there was no big change as they continued to do what they had always been doing. Instead, their situation even got better as they received access to vast resources at Novartis, making their work much more efficient and easier. Like Sugen, Novartis also had to notice that the missing of a stock option program

made some of the employees leave and caused some problems in recruiting younger people, because they expected to get stock options. In contrast to this, some employees valued the job security and better pension plans offered by Novartis.

At Bayer Diagnostics, which also noticed an increase in fluctuation, the first personnel decision was to make clear the first layer of management in order to know who stayed and who left the company, because they wanted to know on whom the organizational integration could be build upon. In order to make good people stay they offered them special incentives in terms of bonuses and other operational and financial support – like the other acquiring companies did as well. Apart from that, Bayer like the other big pharmaceutical companies had to realize that the lack of a stock option programs provided them with some problems in attracting and retaining people.

Tentative hypothesis # 17: *After the acquisition of the biotechnology companies by the pharmaceutical companies there is a significant increase in employees fluctuation on every level, especially on the top management level, partly because their entrepreneurial aspirations can no longer be satisfied.*

Tentative hypothesis # 18: *After the acquisition, the acquiring pharmaceutical companies try to make sure that at least some of the top management people of the biotechnology companies stay in order to let them manage the organizational integration while providing some stability and continuity.*

Tentative hypothesis # 19: *The missing of a stock option program after the acquisition causes severe problems in attracting and retaining employees as stock option are considered as being part of the culture in U.S. biotechnology companies.*

Tentative hypothesis # 20: *In order to make people stay after the acquisition has been carried out and to make up for the loss of the stock option programs, they are offered special incentives and bonus programs.*

Tentative hypothesis # 21: *Employees at the acquired biotechnology companies welcome the takeover as they appreciate the job security and especially the*

access to the vast resources big pharmaceutical company can offer, enabling them to do better research.

Apart from the more content-orientated perspective of the organizational integration, which has been discussed in the paragraphs before, it is also necessary to consider the process-perspective of the organizational integration process. This means, that an analysis of the organization of the overall integration process, allowing the different integration issues to be set in place, needs also to be taken into account.

From Sugen-side the responsibility for the organization of the integration process laid in the hands of its Executive Vice President & President for Research and Development and was also supported by Pharmacia's Chairman and CEO, reflecting the support from the very top of the company. At Sugen, its newly appointed President took over the responsibility for the integration process. The integration itself was not carried out by a single integration manager – although one might even attribute this role to Sugen's President – but by an integration team co-headed by Pharmacia's Executive Vice President and Sugen's President. This mutual responsibility, reflecting the common spirit and the interpretation of the acquisition as some kind of 'merger of equals', could also be observed in the other integration processes. In addition to that, no external consultants were involved leading to a slower integration process, but at the same time to a more stable organizational structure emerging – more or less – out of a natural evolution, which was unique to that case. Communication took place on two different levels. The first one was the overall communication given in speeches to all employees at Sugen either by executives from Pharmacia or from Sugen, and the other one was in smaller groups or via face-to-face communication and, by this, had a more personal touch.

Compared with the other cases, the integration process between Merck and Lexigen was no real integration process as it was rather part of a reorganization process. The reason for this laid in the fact that in this case, the acquisition was not supported by the very top of the group as it was in the other cases. Instead, it was the oncology business area team which fostered the acquisition and subsequent integration of Lexigen. The change of the original integration plans was based on the reorganization decision and, with the creation of EMD, made

also the role of Knut Sturmhoefel change. At the beginning, he was considered as being an integration manager as part of an integration team and after the reorganization decision his role turned more into that of an interface manager. Although the first integration process was carried out rather quickly and straightforward, this structure never became really effective and was replaced by a rather slow reorganization or, in other words, adjusted integration process. Furthermore, there was also not enough clear communication.

The responsibility for the acquisition and integration of SyStemix and GTI was also taken over by a board member of Novartis. Compared with the other cases, the integration was not carried out by an integration team, but by one or two senior executives from Novartis who went to the biotechnology companies and acted there as some kind of integration managers. As in the case of Lexigen and Merck, the acquisition of GTI and SyStemix was influenced by a subsequent reorganization and consolidation process, in which some communication problems occured. However, this consolidation process only started after the first integration process had been finished and the respective collaboration also had been effective.

As in the cases of Pharmacia and Novartis, the decision for the acquisition and subsequent integration of Chiron Diagnostics was approved and supported by Bayer's board in Leverkusen. Due to the fact that this acquisition did not only include the small biotech-dominated NAD segment at Emeryville, CA, but also the much bigger diagnostics business, a special, more elaborated structure consisting of a steering committee, a full-time integration manager as well as 20 integration teams was set in place. However, the same basic approach as used in the other cases was applied, i.e. there was an integration manager and different integration teams in charge of the process. In some areas this process was supported by outside consultants. Speed, especially in the context of filling the top positions at the newly created entities, as well as communication were considered as being two guiding principles for the integration process. The communication structure was the same as it was in the Pharmacia-Sugen deal and took place on two different levels. The first level was the kind of general communication given in speeches and information to all employees, whereas the second level of communication focused on the early, personal face-to-face communication between the employees and their respective superiors.

Tentative hypothesis # 22: *The acquisition and subsequent integration of the acquired biotechnology company is approved and supported by the top management of the pharmaceutical company.*

Tentative hypothesis # 23: *The integration process is carried out by a few integration managers or by an integration team which are co-headed by people from the pharmaceutical and the biotechnology company, reflecting the spirit of a 'merger of equals'. Due to the small size of the acquired biotechnology company it is not necessary to set a separate integration structure in place.*

Tentative hypothesis # 24: *If necessary, external consultants are involved in the integration process in order to support it.*

Tentative hypothesis # 25: *Communication plays an important role during the integration process and is carried out on two different levels. The first level concerns the overall information of all employees given in general speeches, whereas the second level focuses on the personal face-to-face communication between the employees and their respective superiors.*

Tentative hypothesis # 26: *Speed plays an important role in the integration process as there is a clear need for the filling of the top positions of the acquired biotechnology companies. These people are supposed to carry out and take over the responsibility for the integration process.*

Besides these cross-case topics discussed in the paragraphs above which could be attributed either to the acquisition motives, the integration topics or the organization of the integration process itself, a few more very interesting issues emerged that cannot really be put into these categories. At some points during the case descriptions as well as the within-case analyses it turned out that the acquisition of the biotechnology company is – more or less – considered as being some kind of a 'simple' investment that pays off or not. This becomes especially obvious in the deal between Novartis and SyStemix/GTI as well as the acquisition of Sugen by Pharmacia, which was explicitly characterized as some kind of 'external investment'. Apart from that, it was the Novartis case that revealed best – although it also appeared in the deal between Pharmacia and Sugen – that the nature of the acquired biotechnology company changed in a fundamental way. It is not only the culture, it is even the existence of the

company which develops from an independent, publicly traded company into a division or unit of a big pharmaceutical group. This step is necessary in order to consider and treat such a company or, in other words, acquisition as an investment. If this investment does not create value, it will be stopped. In fact, that is what Novartis did with the consolidation of SyStemix and GTI. It had to decide about an effective resource allocation decision and not about the future survival of a (former) independent, publicly traded company. Such a decision could never be made by the executives of a publicly traded company. In order to make such a decision the nature of the company must change as it has happened subsequent to the acquisition and post-acquisition integration of the small biotechnology company into the structure of the big pharmaceutical company.

Tentative hypothesis # 27: *The acquisition of a biotechnology by a big pharmaceutical company fundamentally changes the nature of the biotechnology company, because it is no longer an independent, publicly traded company, but ultimately turns into a center of excellence of a big pharmaceutical company.*

Tentative hypothesis # 28: *The acquisition of a biotechnology company is considered as an investment that pays off or not. If it does not create value, the pharmaceutical company will simply decide to close or sell the respective site as part of a resource allocation decision.*

Based on the different contextual case descriptions, this section has carried out the comparative analyses of the five case studies of organizational integration and collaboration after the M&A deal and summarized these findings by developing a set of tentative hypotheses. They are tentative due to the fact that they still have to be confronted with the existing literature for further refinement and because the theory extension, which will build on the tentative hypotheses, will eventually have to be subject of large-sample quantitative testing. Apart from that, these tentative hypotheses are not yet mutually exclusively as they still have clear overlaps.

4 Theoretical perspectives of the post-acquisition integration and collaboration process

> *"Unless the acquired company is integrated functionally, financially, or managerially, the likelihood of shareholder wealth creation is very low. At the other extreme, careless and insensitive integration can wipe out the culture of the acquired company, destroy its skill base, and cause losses in market share." (Hoover, 1994, p. 225)*

After having described and analyzed the different cases of organizational integration and collaboration in the previous chapter, this chapter aims at refining the findings of the case study chapter. Although this is a new chapter, it does definitely not constitute a break from the previous chapter, it rather represents a continuation of the process of case-based research. As already pointed out in the discussion of the methodological foundations of this study (section 2.1), case descriptions and analyses should ideally be 'theory-free', allowing the researcher to capture the richness of the cases without any kind of bias. Only after tentative hypotheses have been drawn from the cases should theory or, in other words, the existing literature, be enfolded (Eisenhardt, 1989). It is an essential component of case-based hypothesis formation and theory extension that the tentative hypotheses are juxtaposed with conflicting and similar theoretical findings. Hence, it is the overall goal of this chapter that the tentative hypotheses can be challenged, corroborated and, eventually, refined in such a way that together they serve as an extension to theory or even result in the formulation of a new theory.

The literature to be enfolded by confrontation with the case study results consists of a broad body of theoretical writings in the fields of M&A, post-merger/post-acquisition as well as some internationalization literature. All these streams of scholarly work are well-established fields.

Section 4.1 confronts the extant studies of M&A motives and reasons with the case findings. Section 4.2 turns to a discussion of how post-merger and post-acquisition integration literature might contribute to the understanding of the observations made in the previous chapter, and also presents some thoughts on how concepts of the organization of the post-acquisition process can offer support for the insights gained in the case studies. The discussion of these fields

will have to be restricted to the most prominent theoretical approaches due to the large size of these different disciplines. Having proved that the extant theory is unable to explain large parts of the observations made, Chapter 5 is devoted to the construction of a new approach with the help of other interesting concepts such as the famous value chain concept of Porter or the concept of core competencies.

4.1 Confronting extant M&A theories with the case findings

> *"Consider the waves of mergers that have swept across the United States during the past century, first to consolidate firms of single industries into giant trusts, then to extend the operating chains of these firms forward and backward in so-called vertical integration, and in more recent times to agglomerate all kinds of diversified businesses into single corporations. Some of the forces that drove these were no doubt economic. But many have also been political, when not representing a sheer lust for power then at least reflecting the reality that to avoid being taken over by another organization, you had better take it over first. How many small, healthy organizations have been destroyed over the years by having been gobbled up by the big bureaucracies (which immediately bureaucratized them – 'What, no organization chart?' say the technocrats)? Unless, of course, they voluntary forfeited that small size to become those voracious bureaucracies themselves." (Mintzberg, 1989, p. 341-342)*

The introductory quotation of Mintzberg makes evident that there have been different merger waves (Müller-Stewens, Spickers & Deiss, 1999; Jarrell & Poulsen, 1994; Gaughan, 1994; Jansen, 1998 & 2000; Dymski, 1999) during the last century, which also indicates that different motives and M&A strategies exist that might explain why takeovers have been carried out. The question is whether the existing studies or theoretical approaches can explain why pharmaceutical companies acquired biotechnology companies and, in turn, may of course also reveal why biotechnology companies accepted the takeover bid of the larger

pharmaceutical companies. During the 1990s the fifth merger wave[44] took place whose two major objectives were an increase in Shareholder Value as well as globalization. Besides an emphasis of horizontal acquisitions, the overall focus was put on the strengthening of core competencies (Hamel & Prahalad, 1990; Gut-Villa, 1997). Bleeke et al. (1994, p. 80) refer to this in the sense that

> *"a successful cross-border acquirer buys targets in its core business".*

Besides looking at the motives that make companies participate in the M&A game, Cartwright & Cooper (1990) have identified a number of factors they later refer to as 'merger climate', which might facilitate the increase in M&A activities (Cartwright & Cooper, 1992):

(1) Certain market conditions bring about a need to consolidate or capture new markets.

(2) There is an increasing availability of capital, within organizations as well as within financial institutions.

(3) More companies are at sale as the successful entrepreneurs of post-war years reach retirement age.

(4) The easing of regulations has also a positive impact on acquisition activities.

(5) The need to share risks, particularly in capital-intensive industries, often results in the formation of joint ventures or mergers.

(6) There are also complex indivisible problems (Aldrich, 1976) that are considered to be too big to be resolved by any single organization.

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[44] The first merger wave started in 1897 and ended in 1904 and featured mainly horizontal mergers that often resulted in monopolies or near monopolistic industry structures. The second merger wave, from 1916 to 1929, was characterized by mostly vertical transactions with the aim of taking advantage of economies of scale. The third merger wave, which is also called the conglomerate era, began in 1965 and ended in 1969. Companies expanded into dissimilar lines of business. The fourth merger wave lasted from 1984 until 1989 and featured many unique characteristics which separated it from previous waves such as aggressive takeover tactics, leveraged buyouts and junk bond financing (Müller-Stewens, Spickers & Deiss, 1999; Gaughan, 1994).

(7) Moreover, unrecognized psychological motives for merger and acquisition activities such as fear of obsolence (Levinson, 1970) or a CEO's decision to play a new game and create some excitement among senior managers (McManus & Hergert, 1988; Hunt, 1988) may have a certain influence.

Comparing these factors with the situation found in the case studies and the industry analysis of the pharmaceutical and biotechnology industry at the beginning of Chapter 3, one can draw the conclusion that besides the consolidation in the pharmaceutical as well as biotechnology industry, none of these factors really has an impact or can explain why M&A activities between pharmaceutical and biotechnology companies have occurred. E.g., Zimmermann, Mekler & Steinmezu (1998) consider the market surrounding, the product portfolio in terms of current products as well as the project portfolio in terms of future cash generators as drivers for M&A activities in the pharmaceutical industry. But, they do no take the relationship between pharmaceutical and biotechnology companies into account.

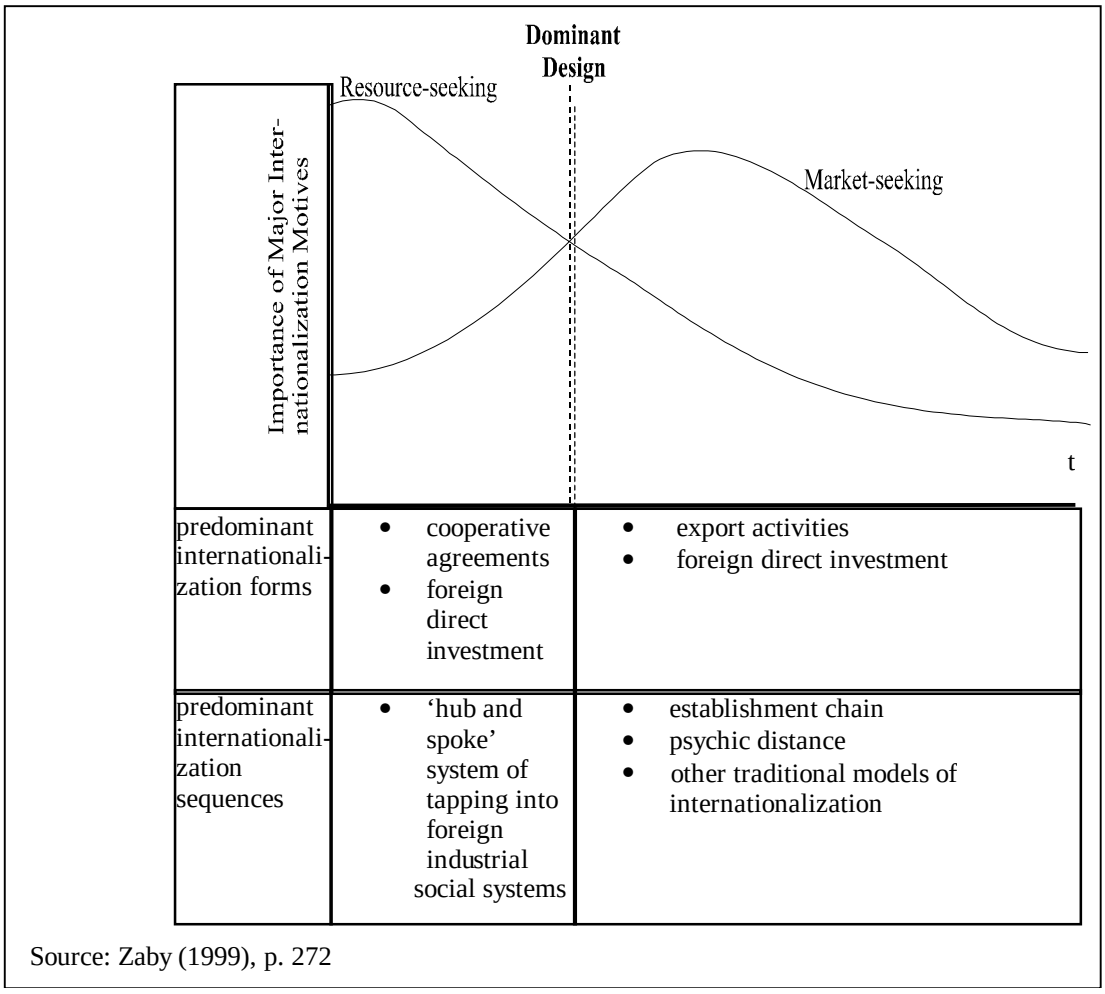
Apart from that, one may also consider the 'follow-the-leader'-discussion (Ansoff & Stewart, 1967; Maidique & Patch, 1988), because e.g. in 1990, the Swiss pharmaceutical giant Roche acquired a 60% equity stake in the Californian biotechnology Company Genentech in a deal worth $2.1 billion. One and a half year later, the Swiss competitor of Roche, Sandoz AG (now: Novartis), acquired a 60% interest in SyStemix for a total of $625 million. Thus, the 'follow-the-leader' strategy may also be a possible explanation – at least for the M&A activities of Novartis. However, none of the identified motives (Tentative hypotheses #1, #2 and #3) can be explained with the help of this theory. A study of McKendrick (2001) about the global strategy and population-level learning at the example of the hard disk drive industry has come to the conclusion that firms from the same nation are likely to adopt similar global strategies initially, but that, over time, the industry as a whole converges on the same blueprint for action.

Zu Knyphausen-Aufseß & Zaby (2000) have developed the industry-life-cycle-model (cf. Figure 22) which is based on the findings that patterns of internationalization during the early stages of a high-technology industry diverge considerably from the patterns – based on observations in mature industries –

that are described in traditional theoretical approaches. They argue that the lack of adequate 'social systems'[45] in a firm's home country leads to internationalization to host countries where such 'social systems' are in place. This argument matches quite well with the specific industry situation, because the U.S. biotechnology industry – as already discussed in Chapter 2 and Chapter 3 – is more advanced than the European biotechnology industry, so that U.S. biotechnology companies are per se more interesting as potential targets than their European competitors. This kind of internationalization follows the motive of tapping into the relevant clusters within the host country.[46]

[45] Their idea of 'social systems' is based on the 'social systems framework of industry emergence' by Van de Ven & Garud (1989 & 1993) that provides an overview of important elements that serve as necessary preconditions for the emergence of new technology-based industries. These elements include *proprietary functions* such as an entrepreneurial base that has an interest in commercializing technological knowledge, *resource endowments* such as mechanisms for the transfer of scientific research, venture capital or a pool of competent human resources, and *institutional arrangements* such as government research funding, patent systems and the societal legitimation of new technologies and new industries.

[46] E.g., companies of the information technology industry often invest in the Silicon Valley whereas banks concentrate their activities on financial centers (zu Putlitz, 2001). This view is also supported by Porter (1990) who states that "the other reason for a foreign acquisition is to gain access a to highly favorable national 'diamond'" (p. 612). The 'diamond' consists of four broad attributes of a nation (factor conditions, demand conditions, related and supporting industries, as well as firm strategy, structure, and rivalry) that shape the environment in which local firms compete and that promote or impede the creation of competitive advantage.



Source: Zaby (1999), p. 272

Figure 22: Industry-life-cycle-model

Their model contains three aspects that are neglected in traditional theoretical approaches. The first aspect is the role of resource-orientated internationalization motives which are supposed to be dominant compared to market-seeking internationalization in emerging high-technology industries. Compared with the case findings, tentative hypotheses #1 and #3 can be explained by that, whereas tentative hypothesis #2 is rather dominated by the market-seeking motive and, thus, is not covered by this model. The second aspect of the industry-life-cycle-model is the full incorporation of 'cooperative agreements' as one of the most important forms of internationalization. As this study is about the M&A activities between biotechnology and pharmaceutical companies, this second issue does not play a role and is not covered by any tentative hypotheses. The third aspect is the unconventional two-step pattern of internationalization, in which foreign direct investments are considered as being a first step of internationalization. The second step consists of the establishment of a dense

web of alliances. Zaby (1999) argues that M&A can serve as a basis for subsequent alliances within a cluster and characterizes this sequential approach as a 'hub' and 'spoke' system of tapping into foreign industrial infrastructures of emerging high-technology industries. In this sense, M&A is considered as being a first step of internationalization. Nevertheless, this third aspect cannot be really explained by the case findings (Tentative hypotheses #1, #2 and #3).

It is now necessary to have a look at the more general reasons or, in other words, motives and, by this, the corresponding M&A strategy that made the pharmaceutical companies acquire the biotechnological companies. E.g., a simple approach is that of Robers (1994) who mentions the four most usual motives for acquisition: pure diversification, improved market position, turnaround situation and acquiring technology. Of these four motives two motives, improved market position as well as acquiring technology, can be identified in this study (Tentative hypothesis #2). In another study, Krallinger (1997) also considers buying technology as one of the major drivers for foreign investors in the U.S. Already Mace & Montgomery (1962) have identified several reasons for the acquisition of one company by another. They consider acquisitions as a means of achieving a company's plan for growth, as investment, to serve the market needs, to buy time, to acquire technical know-how, to achieve product diversification, to achieve integration as well as bigness for bigness' sake. Compared with this study, the overall growth motive (Tentative hypothesis #2) as well as the acquisition of technologies (Tentative hypothesis #1) are identical. Nevertheless, Mace & Montgomery (1962) do not distinguish between short-term and long-term orientated motives that makes up the difference between tentative hypothesis #1 and tentative hypothesis #2.

Seth (1990) develops a conceptual framework and an empirical methodology to assess the value creation in acquisitions. In this context, she distinguishes between value-maximizing and non-value maximizing acquisitions. In value-maximizing acquisitions, the value for stockholders is created by an increased market power of the combined company, economies of scale and scope, coinsurance diversification as well as financial diversification. In non-value maximizing acquisitions, the management tries to maximize their own utility striving only for sales or growth maximization, but not for value maximization. Based on this distinction which is – slightly modified – also applied by Dabui

(1998) or Rohloff (1994) some performance studies have been carried out. E.g., Capron (1999) focuses on value maximizing acquisitions and shows that asset divestiture and resource redeployment can contribute to acquisition performance, with, however, a significant risk of damaging acquisition performance when the divested assets and redeployed resources are those of the target. In comparison with the findings of the case studies, no tentative hypothesis can be covered.

Schoenberg & Reeves (1999) take another approach by asking what determines acquisition activity within an industry. They emphasize the idea that industry profitability, industry growth, industry concentration, capital intensity as well as industry deregulation must be looked at separately, while analyzing and comparing M&A activities within different industries. This idea is also relevant for this study, because this study analyzes the M&A and especially the subsequent post-acquisition integration activities between pharmaceutical and biotechnology companies, having the particular industry development in mind, which has been devoted two sections in Chapter 3. E.g., Pisano (1997b) has examined the relative performance of vertically integrated projects versus collaborative projects in the biotechnology industry by using Akerlof's (1970) model of the impact of asymmetric information on quality. Pisano (1997b) suggests that a potential 'lemons' problem exists in the market-for-know-how which means that only poor quality projects ('lemons') become available in the market. His analysis shows evidence of an apparent 'lemons' problem in the market-for-know-how in the biotechnology industry, because the rate of termination for partnered projects is significantly higher than the failure rate for projects undertaken via vertical integration. This may also be an indication why pharmaceutical companies are increasingly operating through mergers and acquisitions instead of collaborative agreements when dealing with biotechnology companies.

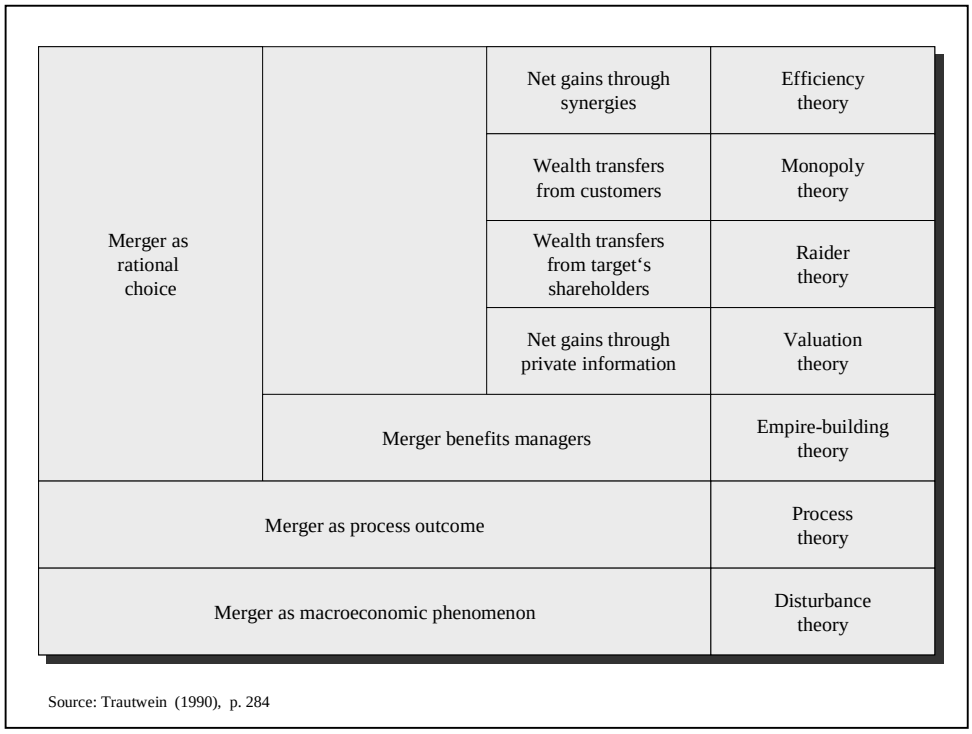
There exist also some studies that have been carried out by consulting companies or investment banks, either focusing on mergers and acquisitions in a more general way or even with a specific emphasis on the pharmaceutical/health-care orientated industry, some of which are discussed shortly. In a study carried out by the London Business School & Egon Zehnder International (1987), the distinction is made between financial, business, political and personal reasons as the motivators behind the acquisition decision of the acquirer. The dominant

motive in the field of financial and business reasons was market share, which has been mentioned by all buyers as a reason. However, in the relationship between pharmaceutical and biotechnology companies, market share does not matter as shown in tentative hypotheses #1 and #2. The second major motive with 35% was the access to technical capabilities, which is relevant for this study (Tentative hypothesis #2). The dominant political and personal reasons, playing no role in the context of this study, were sending signals to the city as well as the chairman's insistence to acquire. In a survey carried out by PricewaterhouseCoopers (2000), based on interviews with 125 top executives worldwide who completed a merger or acquisition in the last four years, they have come to the conclusion that companies are doing deals primarily to build revenue and market position by gaining access to new markets (76%), new products (54%) and a bigger share of market (74%). The first two motives are supported by tentative hypotheses #1 and #2. Interestingly, in contrast to the developed tentative hypotheses, access to new technologies accounted only for 26%. A study of Bain (Duelli, 2000) has identified four major reasons for M&A activities: increase in turnover and profit (80%), supplementing the existing product/project portfolio (70%), increase in market share (62%) as well as the access to new technologies (62%). Compared with this study, the motives two and four observed by Bain match with the tentative hypotheses #1 and #2. However, no distinction is made concerning short-term and long-term orientated motives as well as a separation into the motives of the acquirer, on the one hand, and the target, on the other hand.

Gerpott (1993) also provides a good overview of acquisition motives mentioned in the literature. Compared with the other studies he even goes one step further, distinguishing between the motives from the point of view of the acquirer and the target. Among motives of the acquirer the access to new technologies and new markets as well as the support of the overall growth strategy are mentioned – as identified in the case studies (Tentative hypotheses #1 and #2). The need for financial support is one of the motives for the target, however, the support as far as regulatory affairs were concerned as well as the access to other resources provided by big pharmaceutical companies (Tentative hypothesis #3) are not mentioned by Gerpott (1993). In addition, his analysis of literature did not reveal that acquirers distinguish between short-term and long-term orientated motives of

their acquisition. However, this distinction is crucial for the understanding of the different integration strategies being applied at the same time in the integration of biotechnology companies in the structure of big pharmaceutical companies.

These different sources of literature considered so far do not really provide a systematic overview or classification, they can rather be considered as some kind of more or less complete collection or enumeration of M&A motives. One attempt to close this gap is an article of Trautwein (1990), which surveys theories of merger motives and relates them to prescriptions for merger strategies. In his approach the theories of merger motives (cf. Figure 23) can be classified into seven groups: efficiency theory, monopoly theory, raider theory, valuation theory, empire-building theory, process theory, and disturbance theory.



Source: Trautwein (1990), p. 284

Figure 23: Trautwein's theories of merger motives

On a more general level, Trautwein differentiates between those theories that regard merger consequences as the moving cause behind mergers (first category) from those that do not, like Gort's (1969) disturbance theory, and those approaches that view mergers as process outcomes (second category). In the context of this study, the second category has no explanatory power. In the first category, most theories focus on shareholders' interests, while one group puts its emphasis on managers' interests and their deviations from shareholder value

maximization. The M&A activities observed and described in the case studies definitely aim at increasing shareholder value and are not initiated for the sole benefit of managers.[47] Those theories dealing with shareholders' gains can be distinguished according to the postulated source of merger gains. These are either net gains through synergies or private information or wealth transfers from a target's shareholders or from customers. However, neither the monopoly theory nor the raider theory or the valuation theory can explain the observations made in the case studies (Tentative hypotheses #1, #2 and #3). Only the efficiency theory, especially with its operational synergies, may help to explain a small proportion of the observed activities, because Trautwein (1990) states that they can stem from combining separate units (which however did not really take place in the analyzed cases) or from knowledge transfers. Only the knowledge transfers interpreted the way that it focuses on the access to new knowledge might contribute to classify the analyzed cases. All in all, the classification of Trautwein (1990) is surely one of the best reviews of merger motives.[48] However, it definitely lacks to classify the analyzed cases as there is no distinction between short-term (Tentative hypothesis #1) and long-term orientated (Tentative hypothesis #2) objectives connected with the acquisitions. Moreover, he also does not distinguish between the motives of the acquirer (Tentative hypotheses #1 and #2) and the target (Tentative hypothesis #3).

One of the latest and best overviews about the rationale behind M&A deals is presented by Bower (2001). In order to determine the relative importance of the rationale, he analyzed all U.S. M&A deals over $500 million made between 1997

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47 E.g., an analysis of Schmidt & Schettler (1999) has come to the conclusion that most of the mega-mergers among pharmaceutical companies have been carried out due to economic reasons.

48 There are also abundant other sources that try to analyze, explain and classify merger motives, e.g., Kuhner (2000). Other researchers (Porter, 1985; Coenenberg & Sauter, 1988; Reißner, 1992; Chatteerjee, 1986 & 1992; Ehrenberger, 1993; Ossadnik, 1995; Perin, 1996; Ziegler, 1997; Eccles, Lanes & Wilson, 1999) heavily rely on the different synergy motives and build their argumentations upon that. Reduced to its simplest equation, the idea of synergy is 1 + 1 = 3, which means that the new combination is greater than the sum of its parts (Robers, 1994). A good overview of the different synergy concepts can be found in Gerpott (1993) or Gertsen, Søderberg & Torp (1998). However, the synergy concept is not undisputed. A very good and critical analysis of the synergy concept is provided by Sirower (1997).

and 1999. As a result of this analysis, he identified five major reasons for M&A activities to occur and, along which that, five different M&A strategies resulting in different challenges. *First*, there is the overcapacity M&A in which the acquiring company as part of an industry with excess capacity intends to eliminate capacity, gain market share and create a more efficient operation. *Second*, the geographic roll-up M&A aims at expanding the existing business geographically, while keeping the operating units locally. *Third*, one can find the product or market extension M&A in which the acquiring company tries to extend its product line or its international coverage. *Fourth*, there is the M&A as R&D meaning that an acquisition is used instead of in-house R&D in order to build a market position. *Fifth*, the industry convergence M&A aims at exploiting eroding industry boundaries, i.e., a new industry is emerging and the company tries to establish a position in this emerging industry by culling resources from existing industries.

Comparing these strategies with the insights gained in the case analyses concerning the short-term and long-term orientated motives for the acquisitions of biotechnology companies by pharmaceutical companies, it becomes obvious that two of the identified M&A strategies by Bower (2001) are always applied at the same time. On the one hand, the short-term orientated motive of improving the current competitive position of the pharmaceutical companies by filling up their R&D pipelines and getting access to potential blockbusters (Tentative hypothesis #1) clearly corresponds to the product extension M&A. On the other hand, the long-term orientated motive of strengthening the overall growth strategy of the company (Tentative hypothesis #2) by considering the biotechnology company as a center of excellence in a particular technological field corresponds to the M&A strategy as R&D. Considering also the development of the pharmaceutical industry in close connection with the biotechnology industry, the industry convergence M&A plays a role as well and may, to some extent, refer to the motives why the biotechnology companies accepted the takeover bids (Tentative hypothesis #3). However, this strategy only explains the overall consolidation in the industry, whereas the product extension M&A as well as the M&A as R&D strategy can help to explain the motives of the companies. Moreover, the framework of Bower (2001) lacks to explain the distinction between the short-term and long-term orientated motives, which have

occurred at the same time. Of course, each single motive is explained, but clearly not the combination of both. Nevertheless, it is very crucial to consider that both motives – and in the terminology of Bower, M&A as R&D and M&A as product extension – are in place at the same time and, thus, they also need to be realized simultaneously. The fact that both motives/M&A strategies need to be realized at the same time has tremendous repercussions on the subsequent post-acquisition integration and collaboration strategies, as will be shown in the following section. Because, without a clear cut and separation between these two motives with its corresponding M&A strategy, an understanding of the integration process is not possible.

The contribution of Bower is that he makes an important first step by linking the M&A motive or rationale with a specific M&A strategy. This study goes even one step further, because it does not only link M&A motive and M&A strategy with each other, but it also includes a second very crucial step by explicitly linking M&A motive and M&A strategy with the necessary post-acquisition integration strategy. Without a reasonable post-acquisition integration strategy, the goal of the acquisition can never be realized. The peculiarity of the M&A activities between pharmaceutical and biotechnology companies analyzed in this study is that there are two motives with two M&A strategies and consequently, also two different post-acquisition integration strategies in place. How this works and if extant post-merger integration literature is able to explain that phenomenon is part of the following section.

4.2 Confronting extant post-merger integration literature with the case findings

> *"Big fish versus little fish: the target business may be a small division of its original parent; when acquired, it may find itself among the larger operating units of the newly formed organization. Or, conversely, a one-time whale may suddenly feel itself in a minnow in a mega-corporation." (Bohl, 1989, p. 24)*

This section will now confront the dominant theories in the field of post-acquisition and post-merger integration with the hypotheses developed in Chapter 3.6. Although the introductory quotation taken from a study of the American Management Association (Bohl, 1989) concerning the effects of mergers and acquisitions seems not to be directly linked with the issues discussed in this study, it nevertheless clearly reveals the underlying contradiction that motivated this study. It is the big contrast between a large company, on the one hand, and a very small and young company, on the other hand. The interesting question is how to get these two organizations to work together after the acquisition. The following section will deal with the analysis of the organizational integration and collaboration after the M&A deal focusing on a smooth organizational integration which tries to enable both organizations, the big and the small fish, to work together effectively and not to let the small fish be eaten by the big one. An inherent problem of the following section is that – ideally – the different concepts should be handled and discussed simultaneously. However, a written study imposes the author a sequential procedure. The logic of the following section is as follows. To start with, the determination of the overall integration approach/strategy will be analyzed, because that predetermines how the future steps of the integration process will be processed. Before analyzing the different organizational integration topics of organizational/structural integration, knowledge/competence integration, cultural as well as personnel integration, there will be a short look at the different 'fit-concepts', which mainly serves as an illustration for the importance of an organizational fit and, by this, also the relevance of analyzing the post-acquisition organizational integration issues.

4.2.1 Determination and concepts of the overall integration strategy

The remark mentioned in the introduction to this chapter about the small and the big fish is also supported by Magnet (1984), who states that one of the toughest question in M&A management is:

> *"How to acquire a company and fold it into its new parent without smothering the vital spark that made the acquired company good enough to buy in the first place." (Magnet, 1984, p. 56)*

Following the question of this quotation the first crucial decision in the post-acquisition integration strategy is to determine the overall integration approach/strategy with regard to the degree of autonomy provided by the acquiring company to the management of the acquired firm in managing post-acquisition operations (Tentative hypothesis #4). This is absolutely necessary in order to plan the subsequent steps in the post-acquisition integration process (Hase, 1996). One interesting empirical study about the issue of autonomy that has explored the importance of the autonomy decision and its impact on the success of an acquisition has been carried out by Datta & Grant (1990). Autonomy in the context of acquisitions can be described as the amount of day-to-day freedom that the acquired firm management is given to manage its business. This understanding of autonomy implies that the management of the acquired firm has the freedom of influencing events and making the day-to-day operating decisions without close control by the parent company (Hayes, 1979). The results of their study show that acquiring firms give greater autonomy to the acquired firm management in unrelated acquisitions than in related acquisitions. Moreover, autonomy is associated with superior performance in such unrelated acquisitions, but the relationship is not significant in related acquisitions.

The question now is to decide whether the acquisition of biotechnology companies by pharmaceutical companies can be considered as related or unrelated acquisitions. Of course, there are as many arguments that favor judging such acquisition as a related acquisition as well as an unrelated acquisition. Thus, one should rather consider these acquisitions as being both at the same time, which means that one part of the acquisition takes place in a related field and another part belongs to an unrelated field. In fact, that is one of the peculiarities

of the relationships between pharmaceutical and biotechnological companies. Thus, the result of the study by Datta & Grant (1990) that granting autonomy is associated with superior performance supports tentative hypothesis #4, which states that the overall integration strategy is to grant the acquired biotechnology company a very high level of autonomy. However, tentative hypotheses #5, #6 and #7 can neither be explained nor supported by the study of Datta & Grant (1990). The reason for this is the ambivalent character of biotechnology's acquisitions by pharmaceutical companies, being related and unrelated at the same time. In the area in which the pharmaceutical company perceives an unrelated acquisition, as it is in the field of research and partly also in development, it grants the biotechnology company as much freedom as possible and, by this, applying the results of the study by Datta & Grant (1990). However, in the areas in which the competencies are in the hands of the pharmaceutical company, such as sales and marketing, it grants no autonomy at all, instead takes over complete control. To sum up, the study of Datta & Grant (1990) is implicitly able to explain the basic strategies chosen by the pharmaceutical company (Tentative hypothesis #4), but does not come up with any hint that an acquisition can have two different integration strategies at the same time (Tentative hypotheses #5, #6 and #7).

A study by Chakrabarti & Souder (1987), based on the analysis of 31 acquisitions, focuses on the managerial perceptions of the success of corporate mergers and acquisitions as a means of acquiring new technologies. This study also supports the results of the study carried out by Datta & Grant (1990). Chakrabarti & Souder (1987) have come to the conclusion that corporations ought to be careful about imposing a bureaucratic process on a newly acquired division, due to the fact that organizational integration without an excessive increase of formalization was found to be the key to enhance the performance of the acquired division. Moreover, red tape turned out as stifling the innovative spirit of the acquired companies. Again, their recommendations reflect the behavior of the pharmaceutical companies by granting the acquired biotechnology businesses as much autonomy as possible (Tentative hypothesis #4), but do not consider the use of two different integration strategies at the same time (Tentative hypotheses #5, #6, and #7). In a subsequent study, Chakrabarti (1990) has analyzed the importance of organizational factors in post-acquisition

performance. This research was guided by the question of what factors lead to a success or failure of mergers and acquisitions. This study concludes that post-acquisition success of firms does not only depend on the strategic fit between the merging firms, but also on the organizational integration between them, as organizational factors intervene and essentially determine which of the pre-merger potentials are finally achieved and which are not. Integration in his study is – in accordance to the view of Lawrence & Lorch (1967) – defined as the quality of the state of collaboration between the organizational units. Chakrabarti (1990) shows that intensive communication between the acquired division and the other organizational units on technology or joint projects are key elements in sharing the strategic capabilities. Furthermore, an increased level of formalization in resource allocation and other management decision areas adversely affects post-acquisition performance. In addition to that, he also points out that

> *"management of acquired units need more understanding and an attitude of investment in future". (Chakrabarti, 1990, p. 259)*

This corresponds also to one tentative hypothesis of this study, which states that the acquisition of a biotechnology company is rather an investment that pays off or not (Tentative hypothesis #28). Apart from that, the study of Chakrabarti (1990) shows that organizational factors are of crucial importance and that it is worth analyzing in detail how these factors are combined in the post-acquisition integration process.

After having seen that organizational integration plays an important role in the post-acquisition integration process and that the autonomy approach should serve as the overall guiding principle in a first step, which is also supported by the results of some empirical studies, one should always keep in mind that the within-case analyses revealed that pharmaceutical companies used two integration approaches at the same time. In this context, the autonomy strategy is the dominant one (Tentative hypothesis #4), however, as far as certain aspects of the integration are concerned, this autonomy strategy is gradually replaced by a more 'total control' strategy from the point of view of the pharmaceutical companies (Tentative hypotheses #5, #6 and #7). Therefore, it is now time to take a look at the contributions different post-acquisition integration concepts can make.

These concepts can be classified into different groups. One group deals explicitly with the content of what is to be integrated and, by this, has a more operational focus. These concepts are usually summarized under the heading of ‘fit-concepts’ and often just name the different areas which need to be taken into account without linking them to any specific M&A strategy. The other group tries to distinguish between the basic strategies of integration and, thus, has a more strategic view on the integration process. This study will first take a look at the more strategic-orientated approaches, because this is considered to be the relevant perspective, and it is necessary to define the overall strategic directions before detailed post-acquisition integration instruments can be applied in order to realize the fit between the companies. The respective integration strategy needs to be tailored to each specific integration.

These few reflections make evident that it is not enough to have a look at the concepts or frameworks which simply state that there needs to be a ‘fit’ between strategy, structure, culture and management. (Of course there will be a few remarks about these concepts as well, in a sub-section with the title fit-concepts.) It is by far more important to analyze the concepts that explicitly link the means for the realization of the fit with the corresponding integration strategy and, by this, give clear recommendations how to handle a specific post-acquisition integration task. After this overall strategic link between M&A motives, M&A strategy and integration approach has been pointed out, we can have a look at the different organizational integration topics and analyze whether and how they support the overall strategic concept.

Shrivastava (1986) has developed one of the first classifications for post-merger integration, determining the extent of post-merger integration according to the acquisition motives in combination with the size and type of the acquired business. As far as this last point is concerned, a distinction between small single-unit firms, functional, divisionalized conglomerate types of businesses was made. Shrivastava (1986) has identified six identified acquisition motives: (1) increase market share in a limited product/market domain, (2) reduce competition, (3) impulse purchase, (4) buying technology, (5) rapid growth, and (6) exploit multiple synergies. However, only two of these motives are relevant for this study: buying technology and rapid growth (Tentative hypotheses #1 and #2). His recommendation for the motive ‘buying technology’ is to completely integrate

physical assets. The motive ‘rapid growth’ is not discussed, because it is considered as a rare occurrence. Confronting these recommendations with the hypotheses developed from the cross-case analysis, none of these recommendations matter, because there is no complete integration of the acquired technology (Tentative hypotheses #5, #6 and #7). Moreover, having in mind that, e.g., Pharmacia had to fill its Phase I/II gap (Tentative hypothesis #1), these acquisitions pursued the goal of supporting the growth of the pharmaceutical companies. All in all, the classification of Shrivastava (1986) is not able to explain the motives observed in the cases (Tentative hypotheses #1 and #2) and does also not distinguish between the motives of the acquiring and the acquired company (Tentative hypothesis #3). However, the basic idea, that there needs to be a certain link between the acquisition motive and the subsequent post-merger integration, is of course relevant to this study and becomes obvious in the following quotation:

> *“Diverse motives complicate post-merger integration, because each motive requires a different extent of integration.[...] Non-integration of the acquired business can be satisfactory in some situations, overintegration can be expensive, and underintegration can be unproductive. Therefore, it is important to determine the optimal degree of integration for each situation” (Shrivastava, 1986, p. 66 and p. 73)*

It has been revealed that the extent of post-merger integration according to the two factors of ‘objectives of mergers’ and ‘size and form of merging companies’ has not much explanatory power for the observations made in this study. Apart from that, Shrivastava (1986) has also developed an overview of different post-merger integration tasks, which is shown in the following Figure 24.

	Coordination	Control	Conflict Resolution
Procedural	Design accounting systems and procedures	Design management controlling system	Eliminate contradictory rules and procedures Rationalize systems
Physical	Encourage sharing of resources	Measure and manage the productivity of resources	Resource allocations Asset redeployment
Managerial and Sociocultural	Establish integrator roles Change organization structure	Design compensation and reward systems Allocate authority and responsibility	Stabilize power sharing

Source: Shrivastava (1986), p. 67

Figure 24: Post-merger integration tasks

In this context, he identifies three central problems of integration – coordination, control and conflict resolution – the management at both companies needs to deal with. Coordinating activities are necessary in order to achieve overall organizational goals. The monitoring and controlling of individual departmental activities is to ensure that they are complementary and are performed at adequate levels of quality and output. Conflict resolution is necessary in case of fragmented interests of specialized departments, individuals, and inconsistent subgoals among them. Besides these three central problems of integration, he also identifies three different types of integration – procedural integration, physical integration and managerial/sociocultural integration (cf. Figure 24) – which he analyzes with respect to the three central problems. The following paragraphs will discuss this and compare it with the tentative hypotheses developed in this study. Shrivastava (1986) does not link the post-merger integration tasks with specific actions necessary to be undertaken in connection with the respective M&A and integration strategy. He just mentions what needs to be done and keeps the realization open.

First, procedural integration involves combining systems and procedures of the merged companies at the operating, management control, and strategic planning levels (Anthony, 1965), and aims at homogenizing and standardizing work

procedures. In this study, the ultimate responsibility – in terms of coordination and control – for finance, controlling, human resources and budgeting issues was taken over by the pharmaceutical companies (Tentative hypothesis #9) and, thus, corresponds to the point of view of Shrivastava (1986). *Second*, physical integration of resources and assets usually accompanies procedural integration and involves the consolidation of product lines, production technologies, plant and equipment, and real estate assets. As this study is about the integration of small biotechnology companies into the structure of big pharmaceutical companies, physical integration does not play an important role, because there was no combination of sites (Tentative hypothesis #13), as every biotechnology company was to preserve its independence. However, Shrivastava (1986) does also include R&D projects as part of the 'physical' integration. As far as the transfers of some research projects from the larger pharmaceutical companies to the smaller biotechnology companies is concerned (Tentative hypothesis #12) physical integration may have a certain importance. *Third*, the managerial and sociocultural integration involves the selection or transfer of managers, the changes in organizational structure including compensation and reward systems as well as the development of a consistent corporate culture. Compared with the experiences gained in the case studies, the aspect of managerial and sociocultural integration really matters (Tentative hypotheses #8, #10, #14, #15, #16, #18, #19 and #20) and will be analyzed in more detail during the discussion of the respective integration topics. To sum up, of the three different types of physical, procedural and managerial/sociocultural integration, only the latter two could be really identified as relevant in the relationship between biotechnology and pharmaceutical companies – although to some extent the physical integration is also concerned. However, the focus of Shrivastava (1986) clearly lays on the integration of product lines, plants, equipment and real estate assets and not on R&D projects. The integration of R&D projects is only a side-effect. Apart from that, Shrivastava (1986) does not consider the fact that two post-acquisition integration strategies could be in use at the same time as revealed in tentative hypothesis #5.

Birkinshaw, Bresman & Hakanson (2000) developed a framework focusing on the task integration and the human integration process and their effect on the success of the acquisition. In their view, the task integration process deals with

the identification and realization of operational synergies, whereas the human integration process focuses on the creation of positive attitudes towards the integration among employees on both sides. Hence, the task integration process views value creation as the objective of the acquisition, measured in terms of transfers of capabilities and resource sharing. The human integration process, however, is concerned with generating satisfaction and a shared identity among the employees from both companies. They argue that the processes of 'task integration' and 'human integration' are conceptually distinct, but, of course, not independent from one another, and that the overall acquisition success is contingent on the effective management of both sub-processes:

> *"The sub-processes of task integration and human integration are separated out and it is shown that effective integration in the cases was achieved through a two-phase process. In phase one, task integration led to a satisficing solution that limited the interaction between acquired and acquiring units, while human integration proceeded smoothly and led to cultural convergence and mutual respect. In phase two, there was renewed task integration built on the success of the human integration that had been achieved, which led to much greater interdependencies between acquired and acquiring units." (Birkinshaw, Bresman & Hakanson, 2000, p. 395)*

The quotation reveals that their recommendation focuses on a smooth human integration process in a first step, which afterwards would make the task integration process easier. The results of their study and the underlying logic of their argumentation are depicted in the following Figure 25:

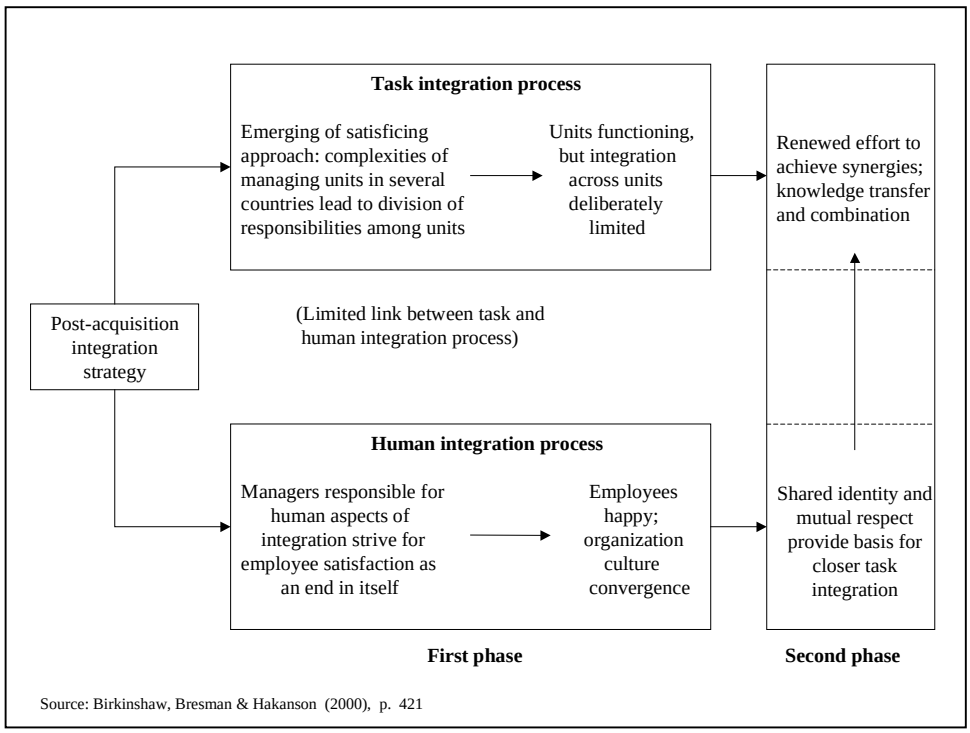

Figure 25: Framework for post-merger integration management

Following the logic and rationale of Birkinshaw, Bresman & Hakanson (2000) would imply that the two companies involved in the acquisition should keep their autonomy at the beginning with only a little amount of integration while concentrating on the human integration process. The 'real' integration – in the terminology of Birkinshaw, Bresman & Hakanson (2000) the task integration process – in terms of combining different units and working together more closely should take place in a further step – after having successfully completed the human integration process. As convincing as this approach may sound, it cannot explain the integration of the biotechnology companies into the structure of the big pharmaceutical companies observed in the cases. One major reason for that is that biotech companies have a 'normal' annual fluctuation between 15 and 18% and after the acquisition this has even increased (Tentative hypothesis #17). Moreover, most of the top management left the company after the takeover, due to the fact that they can no longer strive for the fulfillment of their entrepreneurial spirit and goals (Tentative hypotheses #15 and #17). Hence, it is not really possible to realize a smooth human integration process lasting a few years, simply because too many people leave the company – irrespective of how 'smooth' this process ever might be.

Apart from that, pharmaceutical companies want to profit from their acquired biotechnology companies and aim at getting the best return as quickly as possible, which reflects their perception of such an acquisition as an investment that has to pay off (Tentative hypothesis #28). Furthermore, the overall integration strategy chosen by the pharmaceutical companies is to grant the acquired biotechnology company as much autonomy and independence as possible (Tentative hypothesis #4). In addition, pharmaceutical companies do not strive to convergent the cultures between both companies (Tentative hypothesis #14) as it is the aim of the human integration process by creating a shared identity. In fact, the pharmaceutical companies would be very content, if the biotechnology companies could preserve as much of its former entrepreneurial and risk-taking culture as possible. They definitely do not want to streamline the culture of both organizations. Unfortunately, it is not possible to keep the two cultures separated, as part of the biotechnology culture gets lost and the biotechnology companies gets closer to the pharmaceutical company due to the acquisition and subsequent integration process (Tentative hypotheses #15 and #16). These few remarks make clear that the concept of Birkinshaw, Bresman & Hakanson (2000) cannot serve as an explanation for the observations made during the post-acquisition integration process between pharmaceutical and biotechnology companies.

Considering the existing post-acquisition integration literature, the work of Haspeslagh & Jemison (1991) is among the most prominent ones. The importance of post-merger integration becomes obvious in the following statement:

> *"Many acquisitions look great on paper. Yet, no matter how attractive the opportunity, value is not created until after the acquisition, when capabilities are transferred and people from both organizations collaborate to create the expected benefits or to discover others." (Haspeslagh & Jemison, 1991, p. 11)*

Haspeslagh & Jemison (1991) adopt a process perspective in analyzing acquisitions that shifts the focus from an acquisition's results to the drivers that cause the results. Value creation is considered as a long-term phenomenon that results from managerial action and interactions between the firms. From their point of view the transfer of capabilities will lead to competitive advantage or, in other words, value creation. However, this argument contradicts to the overall

observations made in the deals between pharmaceutical and biotechnology companies, because a real transfer of capabilities did not take place (Tentative hypothesis #11).

Their overall perception of the value-creation process is to consider firms as a set of capabilities embodied in the organizational framework, which can create and sustain elements of competitive advantage for the company, when applied in the marketplace. From their capabilities-based perspective, they suggest that a firm's competitive advantage results from applying a wide range of capabilities and, especially, a set of core capabilities, defined as being central to competitive advantage. As markets are sufficiently varied to provide room for different competitors with different capability profiles to exist, the only real distinctive competence is the ability to mobilize an organization to continually form new combinations of capabilities and to renew them. From their point of view, mergers and acquisitions are considered as part of a corporate strategy for renewing such capabilities. Thus, the heart of integration is the transfer and application of strategic capabilities.

They distinguish the transfer of general management skills, functional skill transfer, operational resource sharing and combination benefits. These issues will be discussed in more detail when having a look at the integration topics, or more precisely the knowledge and competence transfer. Comparing their fundamental view of the organization with the results from the case studies, it becomes obvious that pharmaceutical companies do not necessarily follow the logic of Haspeslagh & Jemison (1991). Of course, they consider competencies at the biotechnology companies as some kind of capabilities, but these capabilities are not transferred from the biotechnology to the pharmaceutical company (Tentative hypothesis #11). These competencies are rather 'added' to the competence portfolio of the pharmaceutical company, as the biotechnology company is now part of the pharmaceutical company. However, these competencies of the newly acquired biotechnology company are not spread across the whole pharmaceutical company in order to stimulate the renewal process (Tentative hypotheses #11 and #13). Instead, these units rather remain independent and turn into centers of excellence within the whole pharmaceutical organization (Tentative hypothesis #12). Thus, the underlying logic of Haspeslagh & Jemison (1991) cannot explain the observations made in the relationships between pharmaceutical and

biotechnology companies after the M&A deal. Nevertheless, it already needs to be mentioned at this point that the pharmaceutical companies apply the concept of capabilities in order to determine the degree of integration (Tentative hypotheses #6 and #7). This insight – as well as the argumentation of the capability concept – will be used and also further elaborated, while discussing and developing the new integration approach as the result of this study. But for now, this study turns to the classification of the different integration approaches developed by Haspeslagh & Jemison (1991), because the perception of how and what is to be integrated varies considerably as the following quotation reveals:

> *"Some managers had a starkly simple view of integration. For some, integration meant 'making them like us'; others managed as if 'nothing should change' in either firm. Other managers saw integration as a 'black box' in which things just seemed to happen after the acquisition, but most of those we studied realized they were immersed in a complex process, full of subtleties and pitfalls." (Haspeslagh & Jemison, 1991, p. 105)*

Haspeslagh & Jemison (1991) distinguish three acquisition integration approaches (cf. Figure 26).[49] These approaches to integration can be understood by considering two central dimensions of the acquisition. The first dimension is the relationship to the acquiring firm, which relates to the nature of the interdependence that needs to be established between the companies in order to realize the type of strategic capability transfer that is expected. The second dimension is the way in which value is expected to be created. This is associated with the need to preserve intact the acquired strategic capabilities after the acquisition. The following Figure 26 positions integration approaches in the light of the relationships between these two dimensions, having in mind that some acquisitions have a high need for strategic interdependence, whereas others do not, and some acquisitions have a high need for organizational autonomy, whereas others do not.

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[49] Following the overall idea of Haspeslagh & Jemison (1991), Sinatra & Dubini (1994) refer to these three modes of integration as 'Colonisation', 'Marriage' and 'Imprinting'.

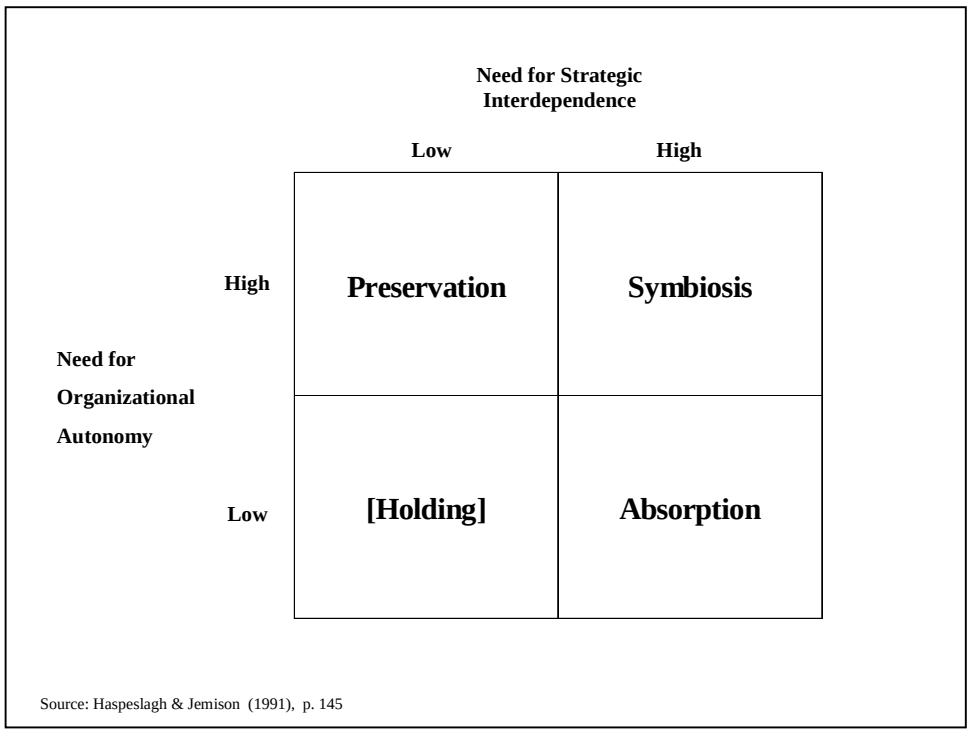

Figure 26: Types of acquisition integration approaches

Absorption acquisitions are those in which the strategic task requires a high degree of interdependence to create the expected value, but has only a low need for organizational autonomy. This kind of integration is what most naturally comes to the mind of people, when they think of what happens after an acquisition, the true consolidation of two companies. This means that integration implies a full consolidation, over time, of operations, organization, as well as the culture of both organizations. According to the research outcomes of Haspeslagh & Jemison (1991), a successful absorption is characterized by four basic tasks:

- The first task involves drawing a blueprint (a plan) for a consolidation. This task should have already started long before the acquisition is completed and ideally involves managers from both sides.

- The second major task deals with managing the rationalization of both organizations, which is normally seen as the essence of the integration process.

- The third set of tasks aims at getting the combined company to move to best practice in all areas of complementarity, whether they be systems, manufacturing practices, or human resource management.

- The final objective is harnessing the complementarity between the two companies in order to create long-term competitive advantage.

Having a look at these four major tasks it becomes obvious that the ultimate objective of an absorption acquisition is to dissolve the boundary between both units. Confronting the absorption approach with the case findings, one can easily draw the conclusion that an absorption acquisition is definitely not the kind of acquisition pharmaceutical companies had in mind when deciding to acquire a biotechnology company. However, a certain movement to best practice could be observed as far as finance, controlling and human resource issues were concerned (Tentative hypothesis #9), but these are not the areas in which value is supposed to be created. Thus, none of these four basic tasks of an absorption acquisition can be found in the deals between big pharma and small biotech, because the overall integration strategy in use was to grant the biotechnology company a very high level of autonomy (Tentative hypothesis #4).

The second type of integration strategy identified by Haspeslagh & Jemison (1991) is the so-called ***preservation acquisition*** in which a high need for autonomy and low need for interdependence among the combining firms exist. In this case, the primary task of management is to keep the source of the acquired benefits intact, because a change in the acquired company's ways of managing, practices, or even motivation would endanger success, because the capabilities require protection from the embrace of the acquiring organization. The overall strategy is to manage the acquired operations at arm's length beyond those specific areas in which interdependence is to be pursued. This overall approach seems to be consistent with tentative hypothesis #4, stating that the acquired biotechnology companies are granted as much independence and autonomy as possible. The areas in which interdependence is to be pursued typically consist of financial and general management capabilities, which would also correspond to the observations made in the case studies in which finance, controlling, budgeting and human resource issues were taken over by the big pharmaceutical company (Tentative hypothesis #9). In addition, Haspeslagh & Jemison (1991) argue that, according to the preservation concept, the main benefit is to be derived from the ability to bring funding to the acquired company. Moreover, they have identified four basic tasks by which a preservation acquisition can be characterized:

- Continued boundary protection is considered as being the first fundamental task in a preservation acquisition. This aims at preserving a distinct culture in which the acquired capabilities are embedded and remain unchanged.

- The second task consists in nurturing the acquired company, because the value that is directly created in this kind of acquisition stems from accelerated business development.

- The third task is to accumulate learning about and from the business. First, the management group of the acquiring company tries to learn about the industry as a prospective new business domain. Second, learning may result from the exposure of the acquiring firm to a different business that may be relevant to the company's existing core business.

- The fourth task is closely related to the third one. This task involves to champion resource commitments to that new domain of business and to combine them with internal development projects.

Trying to summarize the goal of the preservation acquisition, one may conclude that the major integration task is to establish the proper gatekeeping structure. As mentioned earlier, the preservation approach may be able to explain the tentative hypotheses #4 and #9 and, thus, may fit quite well in order to explain the case-study observations. Unfortunately, it is not that easy, because pharmaceutical companies do not just apply one overall integration strategy. Tentative hypotheses #5 and #6 reveal that the choice of the appropriate integration strategy for *each project* of the biotechnology company – and not just for the biotechnology company as a whole – depends on the position of the project with respect to the pharmaceutical value chain as well as the perceived core competencies of the pharmaceutical company with respect to the proven competencies of the acquired biotechnology company. Hence, deciding which integration strategy to use is much more complex and involves the application of different integration strategies according to the specific requirements (Tentative hypothesis #7). To put it in a nutshell, the preservation acquisition does not completely and satisfactory explain the integration activities observed in the cases.

Symbiotic acquisitions are the third type identified by Haspeslagh & Jemison (1991). This kind of integration involves high needs for both, strategic interdependence and organizational autonomy. The two organizations first coexist and then gradually become increasingly interdependent. This coexistence and mutual dependency are slowly achieved despite the tension arising from the conflicting needs for strategic capability transfer and the maintenance of each organization's autonomy and culture. Thus, symbiotic acquisitions have a clear need for both, boundary preservation and, at the same time, boundary permeability. In their research, Haspeslagh & Jemison (1991) have identified four evolving patterns of interaction managers need to cope with:

- The first pattern is to start with a preservation of the acquired company, while the acquiring company makes changes in its own organization in order to be better juxtaposed to the acquisition.

- The next step is called 'reaching out rather than reaching in', which reflects gradually increasing interactions between the acquiring and the acquired companies, preferably on behalf of the acquired company. This step tries to pursue the real purpose of the acquisition, the achievement of a rich capability transfer between both sides.

- The next process, swapping operating responsibility for strategic control, focuses on gaining strategic control over the acquired company, while, at the same time, increasing the operating responsibilities of the managers of the acquired company.

- The final step is the gradual amalgamation of the organizations, being the essence of symbiotic acquisitions, which leads to a combination of the two organizations to become a new, unique entity.

The overall goal of a symbiotic acquisition is to find a viable way through the need of preserving the acquired company's culture, while, at the same, encouraging interdependence to fulfill the acquisition purpose. At a first glance, the symbiotic approach seems to be the strategy that best fits with the activities observed in the cases, because it seems to combine both strategies. Superficially regarded, this may also have occurred in the deals between pharmaceutical and biotechnology companies. But, starting with the preservation strategy is only a

mean by itself, because in a symbiotic acquisition it is never the ultimate goal to preserve the independence and autonomy of the acquired company. It is more or less only some kind of a 'roundabout' way, as a direct absorption approach would lead to a failure of the acquisition. Thus, this strategy cannot explain the observations that came up in the cross-case analyses. In fact, pharmaceutical companies apply two different strategies at the same time. On the one hand, they grant the acquired companies as much independence and autonomy as possible in everything that has to do with research (Tentative hypotheses #4 and #7). On the other hand, they apply an immediate absorption for the products in late-stage clinical trials (Tentative hypotheses #5 and #6). That is not done via a symbiotic acquisition, which calls for some kind of transition period, starting with preservation and then gradually amalgamating the two organizations. In this context, that is simply not a viable solution, because they immediately need to do both, ensure the long-term autonomy in the field of research and make sure that the clinical trials get under control of the big pharmaceutical company as quickly as possible. Hence, pharmaceutical companies apply two completely different integration strategies at the same time, depending on the position of the project with regard to the pharmaceutical value chain.

As the current strategies for post-acquisition integration are unable to explain the observations made in the case studies and, due to the fact, that it is very difficult to handle and realize this complex integration strategies, one of the main objectives of this study is to depict how pharmaceutical companies can handle this balance. This will be done by analyzing the different integration topics of organizational/structural integration, knowledge/competence transfer, cultural and personnel integration as observed in the cases and by comparing them with the propositions made in the existing literature. Before this study turns to that section, there will first be a brief look at possible contributions, the so-called 'fit-concepts' may make.

Fit-concepts

In sum, these 'fit-concepts' only serve as an illustration emphasizing the need for a certain fit between the acquiring and the acquired company, but, beyond this, provide no further insights.

Krüger & Müller-Stewens (1994) have developed a general framework in order to create the required general post-acquisition fit based on a hierarchy of six crucial success factors. In a first step, there needs to be a strategic fit, which is realized by gaining a strategic orientation for the combined company. Based on the developed strategy, two basic requirements must be secured. First, the people responsibility must be answered, which mainly refers to the question whether or not the management of the acquired/acquiring company possesses the necessary knowledge to run the business. Second, the various kinds of implementation resources have to be checked, because reaching strategic goals demands appropriate human, financial, and technical resources. Of course, building up or varying the 'people responsible' and 'implementation potential' are both necessary conditions for reaching success, however, they are not sufficient ones. Based on these assumptions the necessary systems and structures need to be set in place in order to reach success and diminish failure. Apart from that, the impact of the acquisition on the philosophy and culture of the acquired, but also on the acquiring company, needs to be taken into consideration. To sum up, Krüger & Müller-Stewens (1994) have developed this framework with six areas of acquisitional fit as a background for the content of the post-acquisition integration.

Comparing this framework with the different integration topics that will be discussed next, it becomes clear that, besides the knowledge/competence transfer, all of these areas are covered by the framework of Krüger & Müller-Stewens (1994). However, this framework can rather be considered as a checklist that points out which areas are to be considered. It does not allow to establish a link between the M&A motives with its corresponding M&A strategy and the necessary integration strategy.

Apart from this framework of Krüger & Müller-Stewens (1994), there are also many other authors who have developed similar frameworks in order to structure the post-acquisition integration process, some of which are briefly mentioned in the following. Spickers (1995) as well as Grüter (1991) differentiate between structural, political, personnel, and cultural aspects. Kirchner (1991) makes a distinction between strategic fit, on the one hand, and organizational fit, on the other hand. In his approach organizational fit consists of an interplay between

strategy, structure, systems, culture, and shareholders. Hase (1996) distinguishes between strategy, structure, personnel, and culture.

Besides these general frameworks, already in the mid 1980s, Jemison & Sitkin (1986a) have tried to link the (strategic and organizational) fit concept with a process perspective, considering both as potentially important determinants of the activities and outcomes of an acquisition. In their view, strategic fit is defined as the degree to which the target firm augments or complements the parent's strategy and, hence, makes identifiable contributions to the financial and nonfinancial goals of the parent. In contrast to this, organizational fit is considered as the match between administrative practices, cultural practices, and personnel characteristics of the target and parent firm. Moreover, their paper argues that acquisitions should be regarded as a discontinuous and fractionated process with distinctive characteristics that may affect important organizational activities and outcomes (Jemison & Sitkin, 1986b). For an acquisition to be successful, the decision-maker must make the right choices about the strategic and organizational fit, while at the same time having in mind the process character of the acquisition.

Comparing this concept with the hypotheses generated in this study it becomes obvious that the strategic fit between the biotechnology and the pharmaceutical companies does not seem to be the problem (Tentative hypotheses #1, #2 and #3). However, there is clearly no good organizational fit between these two kinds of companies, as there is a rather big and bureaucratic pharmaceutical company, on the one hand, and a small, young and dynamic biotechnology company, on the other hand. Thus, the analysis and the realization of the organizational fit are of crucial importance for a successful acquisition outcome. As there is such a wide gap between both sides, pharmaceutical companies have consequently voted for an autonomy strategy (Tentative hypothesis #4) as their overall integration concept. How this strategy is realized will be shown, when the different integration topics will be discussed.

There are also some empirical studies that try to analyze the relationship between organizational fit and post-acquisition performance. Datta (1991) has examined the impact of organizational differences between acquiring and acquired firms on post-acquisition performance. In his study, the organizational fit, which

influences the ease with which two organizations can be assimilated after an acquisition, is assessed along the differences in ‘management styles’ and in ‘organizational reward and evaluation systems’. He shows that differences in top management styles have a negative impact on post-acquisition performance, whereas no such impact exists between differences in the reward and evaluation systems. To sum up, the ‘fit-concepts’ have only served as an illustration for the need of an organizational integration.

Apart from considering the post-acquisition integration literature one should also have a look at the contribution other research streams may make. In the field of internationalization Schmidt, Bäurle & Kutschker (1999) stress the increasing importance of foreign subsidiaries as centers of competence. In this context, Jarillo & Martinez (1990) propose a framework to characterize the different roles that subsidiaries of multinational corporations can play within the firm’s overall strategy.[50] Based on Porter’s (1986) conclusion that the essential structural characteristic is the degree of interrelationships among competitive environments in different countries and on Ghoshal’s (1987) argument that a company may implement very different strategies in each of its subsidiaries, Jarillo & Martinez (1990) add a third step. They develop a framework (cf. Figure 27).in order to analyze the strategy at the subsidiary level:

[50] The importance of a national subsidiary of a multinational corporation is also supported by a study of Furu (2000) who examines the relationship between a competitive environment, the development of subsidiary competencies, and the integration of subsidiary technological competencies into the rest of the multinational corporation. His findings suggest that national subsidiaries are able to tap into local knowledge and develop distinctive technological competencies that are of use for the rest of the corporation. A very good and brief overview of the literature about the different roles of foreign subsidiaries can be found in Schmidt, Bäurle & Kutschker (1999).

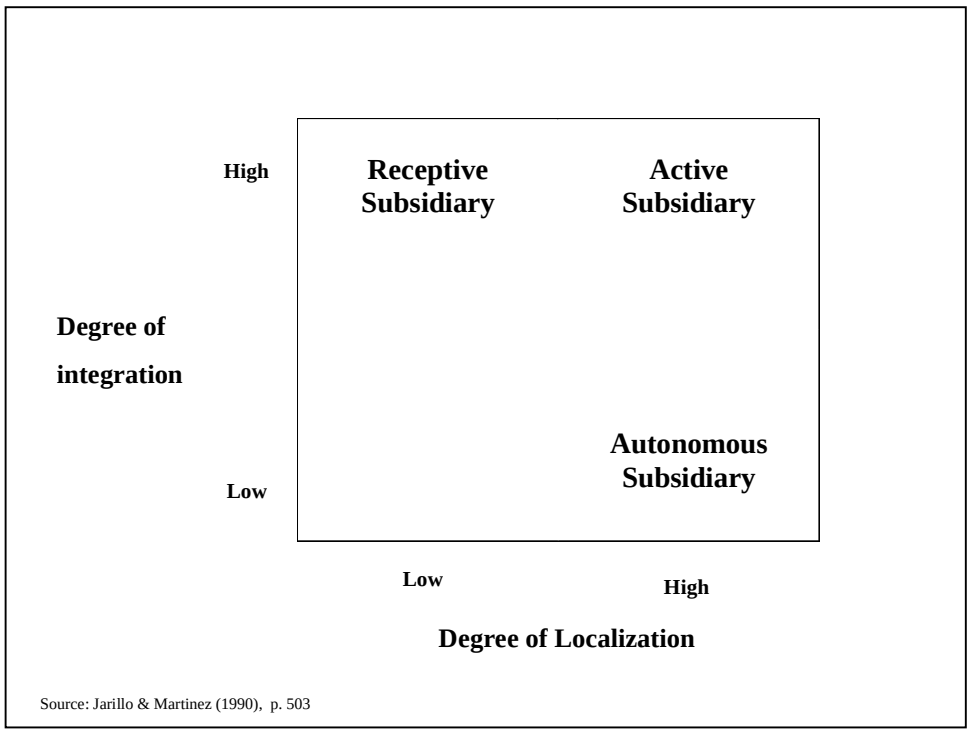

Figure 27: Different types of subsidiary strategy

The two basic dimensions are the 'degree of localization' of activities (i.e. whether R&D, purchasing, manufacturing, etc. are performed in the country) and the 'degree of integration' of those activities that are performed in the country with the same activities in other subsidiaries of the company. These two dimensions are considered as being independent. Jarillo & Martinez (1990) draw the following conclusions: if a subsidiary is following an 'autonomous strategy', it will carry out most of the functions in a manner that is relatively independent of its parent organization. This strategy is supposed to be typical for subsidiaries of multinational firms (Bartlett, 1986), competing in 'multidomestic' industries.[51] In case of a 'receptive strategy', few functions are performed in the country and they are also highly integrated with the rest of the multinational corporation. Such a strategy will be followed by subsidiaries of global firms, operating in global

[51] Following the classification of Bartlett & Ghoshal (1989) a global company is orientated towards the world market, seeking competitive advantage in the economies of scale attendant to a standardized product design, global scale manufacturing, and centralized control. A multinational organization tries to profit from the firm's ability to differentiate its product in each country in order to satisfy local tastes and needs. The transnational organization tries to coordinate operations in all countries where the company is present in order to obtain as many economies of scale and scope as possible, on the one hand, while maintaining the ability to respond to national interests and preferences, on the other hand.

industries. An ‘active strategy’ will be applied, if many activities are located in the country and they are carried out in close coordination with the rest of the firm. ‘Active’ strategies will be applied by subsidiaries of transnational firms (Ghoshal, 1987). Comparing the conclusions of Jarillo & Martinez (1990) with the case findings, it is in fact very difficult to explain the roles of the acquired biotechnology with the proposed framework. Considering the ‘degree of localization’ in the original intention of Jarillo & Martinez (1990), i.e. how many steps of the value chain are covered by the subsidiary, one would have to draw the conclusion that there is a low ‘degree of localization’. In the case of the ‘degree of integration’ in the meaning of Jarillo & Martinez (1990) there is rather a high ‘degree of integration’, because the research done in the biotechnology companies is of crucial importance for the subsequent development as well as sales and marketing. Applying the framework of Jarillo & Martinez (1990), the biotechnology company would need to follow a ‘receptive strategy’ and not an ‘autonomous strategy’ as the tentative hypotheses #4 and #7 clearly demand. Consequently, the two dimensions are not able to capture the nature of the acquired biotechnology, because the focus of the biotechnology company lays on doing basic research and developing promising technologies or products. This makes clear that the acquired biotechnology companies need to be treated with a complete different logic and strategy. On the one hand, there is a need to control a part of the value chain and integrate it into the larger company. But, at the same time, there is a need to preserve the autonomy and independence of the high-tech company in order no to endanger the innovative capabilities and the tacit knowledge embedded in the small company. To sum up, the framework of Jarillo & Martinez (1990) is not able to handle that problem.

The transnational model of Bartlett & Ghoshal (1989) describes several generic roles to foreign subsidiaries. In a later article Bartlett & Ghoshal (1990) establish a link between differentiated subsidiary roles and different innovation processes. Figure 28 shows a framework for the allocation of such differentiated roles based on the strategic importance of the local environment, on the one hand, and the levels of local resources and capabilities, on the other hand. The different local level capabilities are represented by small letters in Figure 28 with (s), (r), and (i) standing for sensing, response, and implementation, respectively. In contrast to this, the global scale capabilities of the subsidiaries are represented by capital

letters, (S),(R), and (I) respectively. However, it needs to be mentioned that these roles only apply to the specific function or product, the global scale sensing, response, and implementation capabilities are built in these units with regard to the specific activities for which they carry the leadership role.

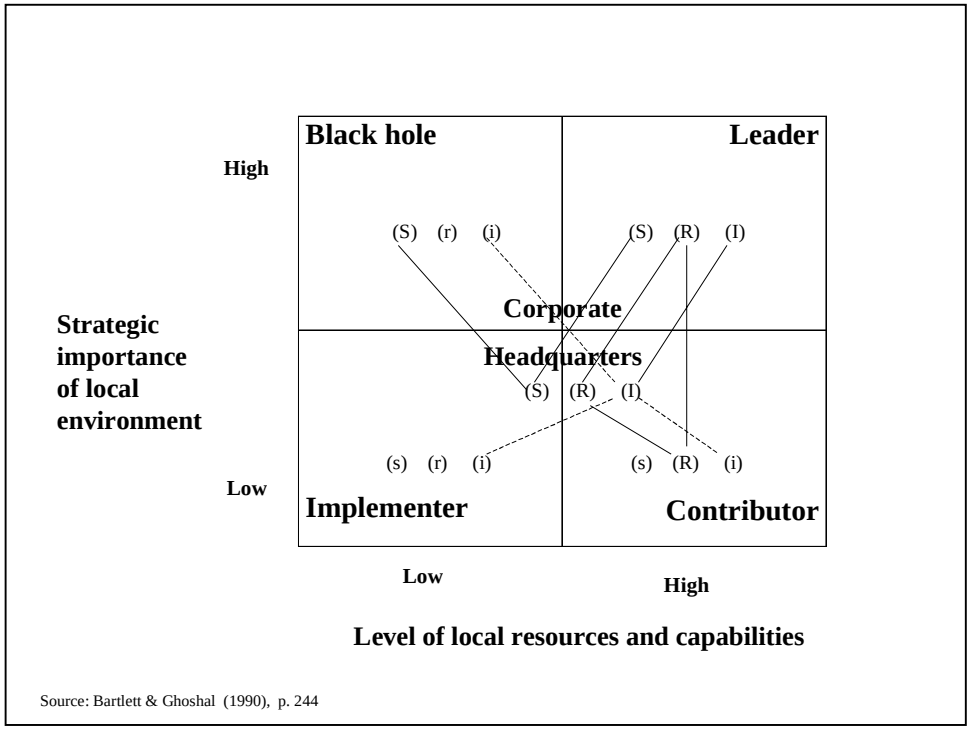

Figure 28: Managing innovations in the transnational organization

Some subsidiaries that are located in challenging and stimulating environments and which posses high levels of technological and managerial capabilities are allocated the role of strategic leaders. These subsidiaries serve as the transnational's innovative spark plugs. This is also the role the acquired biotechnology companies are supposed to play as they turn into centers of excellence for a specific field or activity within the context of the worldwide operations of the pharmaceutical companies (Tentative hypotheses #7 and #12). The role of contributors is attributed to subsidiaries in which competence is high, but the strategic importance of the market is limited. Organizations with relatively low levels of resources in relatively non-strategic market are allocated the implementer role. Their principal task is considered as adapting and implementing central and global innovation in the local context. Moreover, there may be strategically important markets in which a worldwide operating company has only minimal capabilities which are inadequate to exercise the lead role. In this case, the role attributed to the subsidiary is the black hole. One response to

this challenging situation has been to create a small sensory capability in order to exploit the learning potential of the environment.

This section now turns to a more detailed look at how the organizational topics in the post-acquisition process between pharmaceutical and biotechnology companies are realized.

4.2.2 Discussion of the different organizational integration topics

This section discusses the realization of the different organizational integration topics. This will be done by analyzing the different integration issues of organizational/structural integration, knowledge/competence transfer, cultural and personnel integration as observed in the cases and by comparing them with the propositions made in the existing literature.

4.2.2.1 Organizational collaboration after the acquisition

The integration of organizational elements is of course very much predetermined by the choice of the overall organizational integration. As already pointed out in the sections before, the overall organizational integration strategy was to grant the acquired biotechnology companies as much independence and autonomy as possible with respect to its proven core competencies (Tentative hypotheses #4, #5, #6 and #7). Thus, the overall collaboration between the acquiring and the acquired company is reduced to a minimum level. This means, that from an organizational point of view, the acquired organizations were integrated into the matrix structure of the big pharmaceutical company, however, the interaction between both sides was reduced to a minimum and worked more on a project base than on close daily interactions (Tentative hypothesis #8). Nevertheless, this overall autonomy strategy is only applied for the primary activities of the pharmaceutical value chain, which is expected to create value. As far as the support activities like infrastructure, human resource management, financing, controlling or budgeting are concerned, they are completely taken over and controlled by the pharmaceutical company (Tentative hypothesis #9). This observation corresponds to the third task of Haspeslagh's & Jemison's (1991) absorption acquisition, which aims at getting the combined company to move to best practice in all areas of complementarity. Apart from that statement, there is

no existing concept that states and analyzes how this combination is supposed to be set in place. These concepts, similar to the already discussed 'fit-concepts' only state that a certain combination needs to be realized, but do not really describe how to do that.

For the purpose of illustration, one of these concepts (Scheiter, 1989; Habeck, Kröger & Träm, 2000; Gerds, 2000; Lajoux, 1998; Wall & Wall, 2000; Shea, 1999; Picot, 2000; Böttcher, 1996) will be looked at in more detail. Galpin & Herndon (2000) have written a book about process tools to support M&A integration at every level. They identify thirteen organization design parameters that need to be taken into consideration:

(1) The first parameter is the strategic business focus, representing the strengths, capabilities, or business drivers that uniquely distinguish a particular department or unit from another. In this study, the strategic business focus is quite obvious as it is part of the acquisition motives (Tentative hypotheses #1, #2 and #3), but is not considered as being part of the organization design parameters.

(2) The reporting structure is defined as the formal reporting relationship or arrangement for an individual, a process team, or a function. In this study, the responsibility for the newly acquired biotechnology company lays in the hands of a board member to whom the respective reporting is done as well (Tentative hypothesis #10).

(3) Departmentation is the process of clustering work activities into business units or departmental areas of responsibility, that follows the principle of labor division as a mechanism of organizational influence (Simon, 1976). It does not play a role in the context of the case studies.

(4) The determination of the staffing level, which means the quantity of personnel occupying the same job, same process, same team, or same function, is not really relevant in the context of this study, as it was by far a much bigger problem to keep the employees in the acquired biotechnology companies (Tentative hypotheses #17, #18 and #20). In fact, duplication merely does exist.

(5) The depth of control comprises the number of levels or steps of review, endorsement and approval in an organization. As the small biotechnology companies have become part of large pharmaceutical companies with specific review processes for budgeting, the biotechnology companies of course have to undergo the same reviews as the other units within the pharmaceutical companies. Because of the simple fact, that big pharmaceutical company is much bigger than the small biotechnology company, the biotechnology company needs now to follow the longer review process of the pharmaceutical company (Tentative hypothesis #9).

(6) The span of control reflects the number of individuals who report to a manager or supervisor. As the overall decision was to grant the biotechnology company a high degree of autonomy and independence, especially in the day-to-day management of its businesses, the span of control within the acquired company did not change (Tentative hypothesis #4).

(7) Job content/vesting is the degree to which the responsibilities for completing an activity is specified, understood, and accepted by an individual, team, or function. Again, as the overall decision was to grant the biotechnology company a high degree of autonomy and independence, the responsibility for the important tasks of the activities, with respect to the pharmaceutical value chain remained with the acquired biotechnology companies (Tentative hypotheses #4, #5 and #7). As far as the secondary activities (e.g. finance or human resources) were concerned, the ultimate responsibility was transferred to the pharmaceutical company (Tentative hypothesis #9).

(8) Concerning the issue of job content/breadth, which refers to the degree to which an individual performs a broad array of activities, the same conclusions as under the previous point can be drawn.

(9) Analyzing the alignment of responsibility and authority, that is the degree to which the level of authority granted to an individual, team or function is sufficient to accomplish the majority of tasks, one can conclude the same as already under point (7).

(10) The issue of geographical location deals with the specific physical location of a job, process, or location and the people performing the work. In the

analyzed case studies, this point did not really matter, because there has never been any geographical relocation intended (Tentative hypothesis #13).

(11) In the terminology of Galpin & Herndon (2000), the subject of 'integration' means the extent to which business units, departments, or individuals share information, gain cross-functional involvement/responsibility, and coordinate decision-making with other units. As the overall integration strategy is to grant a high degree of autonomy (Tentative hypothesis #4), there is no need for much cross-functional coordination and communication.

(12) Personnel capabilities refer to the set of competencies and skills required to perform the job. As both companies remain autonomous (Tentative hypothesis #4) and people, especially at the biotechnology companies, continue to do what they have been always doing (Tentative hypothesis #21), this problem does not really matter.

(13) As far as bench strength is concerned, which is the degree to which individuals with the right skills or competencies are available to back up or fill positions in both, short-term and long-term, the same conclusions as under the previous point (12) apply.

To sum up, the thirteen organizational design parameters of Galpin & Herndon (2000) correspond to some of the points identified in the cases. However, the parameters of Galpin & Herndon (2000) more or less only 'mention' the different parameters, but do not give any recommendations of how to cope with these parameters in a specific integration situation such as the post-acquisition integration of biotechnology companies in the organizational structure of pharmaceutical companies as analyzed in this study. Thus, Galpin & Herndon (2000) provide only a checklist, but no clear recommendations for a specific integration situation.

Diven (1984) considers the aspect of organization planning as a success factor for the successful implementation of mergers and acquisitions. He differentiates organizational planning according to the issues of (1) planning for organizational change, (2) culture and policy considerations, (3) management resource inventory, and (4) reporting channels and control. In the context of this study, the

last point, dealing with reporting channels and control, will be looked at more closely. This issue is characterized by two central questions:

> *"First, questions arise about who is in control of the new unit. Second, questions arise about the controls that the new unit will operate under." (Diven, 1984, p. 7)*

Defining who is in control of the new unit requires that well defined reporting channels will be established depending on the extent of integration of the two parties to be achieved and the organizational form that the new unit has to take. Diven (1984) points out that in many mergers and acquisitions, the goal is not a significant degree of integration, but the continued relatively autonomous operation of the acquired unit, which is also the case in the analyzed deals between pharmaceutical and biotechnology companies (Tentative hypothesis #4). In such a situation, one reporting channel turns out to be most important, which is the contact between both presidents of the acquired and the acquiring company. This can also be observed in the cases in which the president of the newly acquired biotechnology company reports to a designated responsible board member at the very top of the pharmaceutical company (Tentative hypothesis #10). Related to the establishments of reporting channels is the realization of controls for an acquired company. Diven (1984) suggests that the reports should be kept to the minimum needed, and, if possible, they should be kept within the capability of the existing reporting system. However, this suggestion is not conform with the observations made in the M&A deals, as the necessary reporting processes and systems were transferred from the larger pharmaceutical companies to the smaller biotechnology companies, as they need to fulfill the overall group requirements (Tentative hypothesis #9).

Martinez & Jarillo (1989) have tried to cluster the range of coordination mechanisms used in multinational corporations by reviewing the literature on 85 empirical studies of coordination mechanisms between 1953 and 1988.[52] They broadly define a coordination mechanism as

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[52] In a subsequent study, Martinez & Jarillo (1991) have tried to show a connection between the strategy of the subsidiaries of multinational corporations and the use of different mechanisms of coordinating. Their main finding is that subsidiaries that pursue strategies

> *"any administrative tool for achieving integration among different units within an organization". (Martinez & Jarillo, 1989, p. 490)*

Roughly, coordination mechanisms can be divided into two groups: structural and formal mechanisms, and less formal, more subtle mechanisms. As a result of their review, Martinez & Jarillo (1989) clustered major kinds of coordination mechanisms as shown in the following Figure 29:

Structural and formal mechanisms

1. Departmentalization or grouping of organizational units, shaping the formal structure
2. Centralization or decentralization of decision making through the hierarchy of formal authority
3. Formalization and standardization: written policies, rules, job descriptions, and standard procedures, through instruments such as manuals, charts, etc.
4. Planning: strategic planning, budgeting, functional plans, scheduling, etc.
5. Output and behavior control: financial performance, technical reports, sales and marketing data, etc. and direct supervision

Other mechanisms, more informal and subtle

6. Lateral or cross-departmental relations: direct managerial contact, temporary or permanent teams, task forces, committees, integrators, and integrative departments
7. Informal communication: personal contacts among managers, management trips, meetings, conferences, transfer of managers, etc.
8. Socialization: building an organizational culture of known and shared strategic objectives and values by training, transfer of managers, career path management, measurement and reward systems, etc.

Source: Martinez & Jarillo (1989), p. 503

Figure 29: The most commonly used mechanisms of coordination

As most of these coordination mechanisms have already been explained during the discussion of the concept of Galpin & Herndon (2000), only those coordination mechanisms will be explained that have not yet been included there. In the context of the analyzed case studies, departmentalization did not occur. As far as the centralization and decentralization of decision-making is concerned, there is a cut in responsibility. All supportive activities like finance, controlling or budgeting were centrally managed by the acquiring pharmaceutical companies (Tentative hypothesis #9), whereas the day-to-day management of the

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with a 'high degree of integration' with their corporate parent make much more extensive use of both 'formal' and 'subtle' coordination mechanisms than others.

biotechnology company and its research activities were completely in the hands of the local management (Tentative hypothesis #7). The same conclusion also applies for the third mechanism, standardization and formalization, which only played a certain role in the supportive area, but not in the core activities of the biotechnology company. The aspect of planning was only touched in the sense of budgeting (Tentative hypotheses #8, #9, and #10). Output and behavioral control (Ouchi, 1977; Ouchi & Maguire, 1975) was primarily done via the reporting to a board member of the acquiring company (Tentative hypothesis #10). Apart from that, the acquired biotechnology company remained its autonomy for the day-to-day management of the company (Tentative hypothesis #7).

The group of more informal and subtle mechanisms consists of three kinds of managerial tools. Lateral relations that cut across the formal structure, including direct contact among managers or teams, did not play a major role as the overall strategy was to grant the acquired biotechnology company a high level of independence and autonomy (Tentative hypothesis #4). Informal communication was used in the way that experienced managers from the acquiring companies were sent to the acquired companies in order to make them familiar with the necessary processes and systems (Tentative hypothesis #9). The development of a common organizational culture through a process of socialization was never intended as it was the explicit goal of the acquirers to keep up the specific organizational and innovative culture of the acquired companies (Tentative hypothesis #14). This brief discussion of the analysis of Martinez & Jarillo (1989) has shown that some of the coordination mechanism play a role in the post-acquisition integration and subsequent collaboration between biotechnology and pharmaceutical companies, whereas others are completely neglected. Thus, some of these aspects will be taken up again in the next sections.

4.2.2.2 Aspects of knowledge and competence transfer after the acquisition

As far as the transfer of capabilities or knowledge is concerned, the four analyzed case studies led to the straightforward – but nevertheless very surprising – conclusion that there was no systematic transfer in terms of know-how or technology (Tentative hypothesis #11). This is in clear contrast to the overall

opinion – already briefly mentioned in the context of the discussion of the integration concept of Haspeslagh & Jemison (1991) – that the main goal of integration is the transfer and application of strategic capabilities:

> *"The heart of integration [...] is the transfer and application of strategic capabilities. Capabilities may be transferred in several ways: They may be given to the new sister firm; they may be shared for common use; or they may be taught to people in the other firm. Three types of capability transfer were discussed – operational resource sharing, functional skill transfer, and general management skill transfer. Each type involves different organizational challenges." (Haspeslagh & Jemison, 1991, p. 107)*

Operational resource sharing includes, e.g., combining sales forces, sharing manufacturing facilities, brand names, or distribution channels. In such cases, value is created through economies of scope or scale. Hence, the integration challenge in sharing resources typically involves combining assets or coordinating their joint use. Resource sharing creates value, if the benefits of sharing outweigh the combining and coordinating costs. However, as the acquired biotechnology companies kept their independence (Tentative hypothesis #4) and no operational resource sharing took place, this plays no role in analyzing the observed cases.

The transfer of general management skills involves, e.g., resource allocation, financial planning, controlling and budgeting, as well as human resource management. This issue has already been discussed during the analysis of the absorption acquisition in which a movement towards best practice can be observed. Of course, a transfer in these areas takes place (Tentative hypothesis #9), but is not considered as being the source of value creation in the deals between pharmaceutical and biotechnology companies, if it is compared with the underlying M&A motives (Tentative hypotheses #1, #2, and #3).

The transfer of functional skills such as product development or R&D capabilities[53] seems to be the natural source of value creation in a deal between

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[53] Teigland, Fey & Birkinshaw (2000) have carried out an empirical examination about the knowledge dissemination in global R&D operations in the high technology electronics industry and have come up with an overview of knowledge dissemination mechanisms.

pharmaceutical and biotechnology companies, because pharmaceutical companies gain access to the knowledge and know-how incorporated in these companies, which they then may use in their own research facilities. It seems that this would be the main reason why pharmaceutical companies carry out such a takeover, especially getting access to this knowledge is one of the major motives for their M&A activity. However, exactly at this point, there is a clear discontinuity in the argumentative logic. It is because of the wish of getting access to these skills that they do not even intend to transfer them. Instead, they rather support the biotechnology company in transforming themselves into a center of excellence within the pharmaceutical company (Tentative hypothesis #12), because it is the biotechnology company that knows best how to use its knowledge. Apart from that, this knowledge is very specific and embedded in some kind of local knowledge network, so that it is almost impossible to transfer it without losing it (Tentative hypothesis #13).

Having seen that conventional post-acquisition integration theory is unable to explain the observations made in the context of this study, the question arises how value is created in these deals. One of the values for the pharmaceutical company is the access to promising products they can sell. Thus, at a first glance, one may also interpret such a deal as a pure product deal with the sole goal of getting a potential blockbuster. However, this conclusion does not hold through, as there are also other important reasons that motivated pharmaceutical companies to acquire biotechnology companies (Tentative hypotheses #1 and #2). Biotechnology companies were acquired in order to ensure the long-term growth of the pharmaceutical company. This goal can only be achieved, if the biotechnology companies support an increase in the pharmaceutical companies' innovation. In fact, that is also the explanation why they try to keep up the

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Moreover, Gupta & Govindarajan (2000) have developed a framework for the incorporation of knowledge transfer within multinational corporations. They predict that knowledge outflows from a subsidiary are positively associated with the value of the subsidiary's knowledge stock, its motivational disposition to share knowledge, as well as the richness of transmission channels. Another study of Subramaniam & Venkatraman (2001) also provides evidence that the transfer and deployment of tacit overseas knowledge is associated with greater transnational new product development capabilities. Bendt (2000) gives a good overview about the knowledge transfer in multinational corporations.

autonomy and independence of the biotechnology company. The underlying rationale for that is the assumption that the probability for innovations to occur are much higher in small biotechnology companies than in a large pharmaceutical company.[54] A similar perspective is taken by Hitt, Hoskissen & Ireland (1994), who suggest that an acquirer should search for target firms that will complement R&D projects and/or enhance the acquirer's core competence. However, the acquisition of biotechnology companies must rather be considered as 'adding' – more or less – new core competencies to the acquiring pharmaceutical company, as they consider the acquired biotechnology companies as centers of excellence (Tentative hypothesis #12).

If the acquired biotechnology companies are perceived as centers of excellence within the pharmaceutical companies, the question comes up of how the acquired biotechnology companies fit into the R&D strategy of the pharmaceutical companies. In fact, an increasing number of companies in technologically intensive industries have abandoned the traditional approach of managing the majority of their research and development activities in their home country and are establishing global R&D networks (Gerybadze & Reger, 1999; Teigland, Fey & Birkinshaw, 2000; Peng & Wang, 2000). Because of this, there are also more studies that deal with the globalization of the R&D process (Westney, 1993; Gerybadze, Meyer-Krahmer & Reger, 1997; De Meyer & Mizushima, 1989; Florida, 1997; Kenney & Florida, 1994). Kümmerle (1997) points out that

[54] A longitudinal study that analyzes the relationship between technological acquisitions and the innovation performance of acquiring firms has been carried out by Ahuja & Katila (2001).

> *"a centralized approach to R&D will no longer suffice – for two reasons. First, as more and more sources of potentially relevant knowledge emerge across the globe, companies must establish a presence at an increasing number of locations to access new knowledge and to absorb new research results from foreign universities and competitors into their own organizations. Second, companies competing around the world must move new products from development to market at an ever more rapid pace. Consequently, companies must build R&D networks that excel at tapping new centers of knowledge [...]." (Kümmerle, 1997, p. 61)*

The quotation of Kümmerle (1997) depicts quite well the given situation in the pharmaceutical industry and explains again the rationale for the acquisition of the biotechnology companies (Tentative hypotheses #1 and #2). Kümmerle (1997) identifies two different types of R&D sites. The home-base-augmenting laboratory site is established in order to absorb knowledge from the local scientific community, to create new knowledge, and transfer it to the company's central R&D site.[55] The home-base-exploiting laboratory site is created in order to commercialize knowledge by transferring it from the company's home base to the laboratory site abroad and from there to local manufacturing and marketing. Comparing these two types of R&D sites with the case findings, it becomes obvious that they do not correspond to the center of excellence character that is contributed to the acquired biotechnology companies (Tentative hypotheses #12). Moreover, no systematic transfer of knowledge has been observed in the case studies (Tentative hypothesis #11) as it takes place in the concept of Kümmerle (1997). Thus, his classification is unable of explaining the observations made in the case studies.

Gerybadze & Reger (1999) are also considering the globalization of R&D as a major topic and have analyzed the R&D internationalization in 21 large corporations. They argue, that in recent years the R&D strategies and international location decisions of transnational corporations have changed substantially. Because of the identified changes in the management of R&D and innovation as well as driving forces for locating R&D and competence centers

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[55] An empirical study of Hakanson & Nobel (2000) based on a questionnaire survey directed to foreign R&D units in Swedish multinational corporations shows that more than half of the foreign R&D units actively transfer locally developed new technical knowledge to the home country.

abroad, they have developed a framework for the management of competence centers. This framework (cf. Figure 30) consists of four generic types of transnational R&D innovation and serves as a basis for analyzing predominant patterns of globalization as well as for the assessment of the related coordination and control issues.

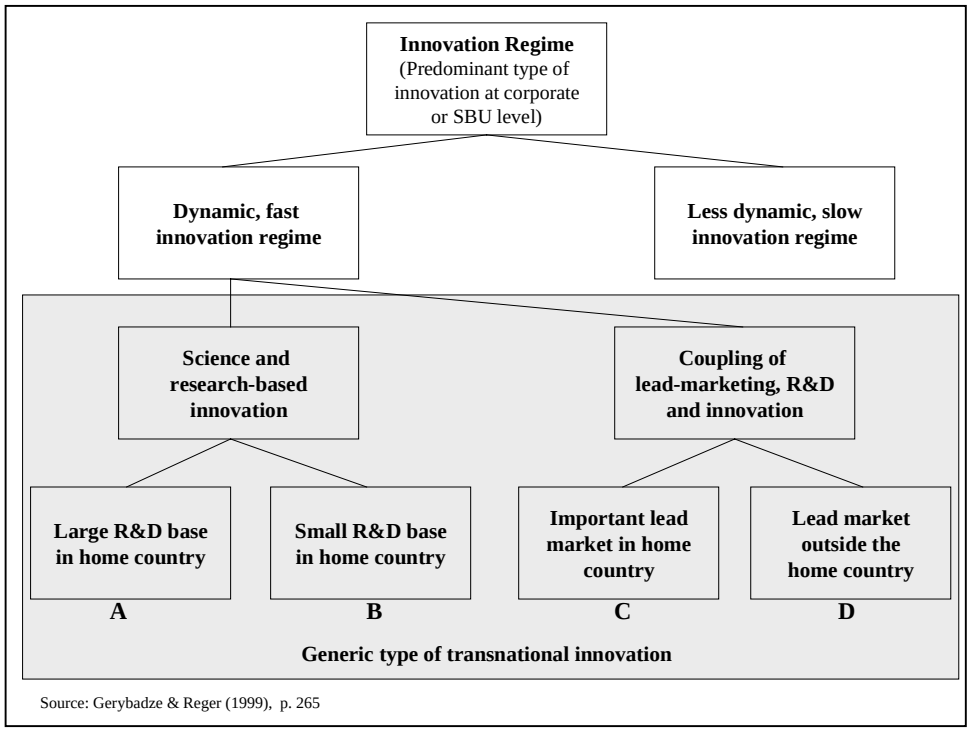

Figure 30: Four generic types of transnational R&D and innovation

In a first step, Gerybadze & Reger (1999) distinguish between two generic innovation regimes: dynamic, fast-cycle businesses, on the one hand, and less dynamic, slow-cycle businesses, on the other hand. The analytical focus of their study was mainly concentrated on the more dynamic, innovation-intensive businesses. In this context, they differentiate between dynamic businesses that are science-based (such as biotechnology) and dynamic businesses characterized by patterns of lead market induced innovation, and by novel ways of demand articulation. Based on this distinction, Gerybadze & Reger (1999) have identified the following four generic types of transnational innovation:

- In the context of *Type A*, the corporation needs to get access to advanced R&D and is at the same time located in a large, highly developed home country with strong R&D capabilities in the respective field.

- A corporation that is characterized as *Type B* depends on excellent R&D, but is located in a small country and/or in a country with a less developed R&D capability in the particular field. This kind of companies have strong incentives to locate critical parts of their research base abroad.

- A *Type C* corporation can benefit from the proximity to a world-class lead market, and is able to establish an effective coupling of lead marketing, R&D and innovation in the home country.

- A corporation that is strongly dependent on the access to a foreign lead market is characterized as *Type D*. Because of the limited size of its home country and/or the level of market sophistication, the company needs to perform critical functions abroad.

In a subsequent step, Gerybadze & Reger (1999) try to classify the R&D and innovation activities according to the type of innovation pursued (science-/ research-based or coupling of lead market and innovation) and the location of the critical resources (i.e. whether critical resources are found at home or abroad). This results in a 2x2 matrix (cf. Figure 31) that classifies the different types of companies and their dominant patterns of transnational innovations:

	Science and research-based innovation	Coupling of lead-marketing and innovation
Large home country and/or large share of critical assets in home country	**Type A** • Companies from large countries • Strong R&D base in this particular field • Dominant R&D center concentrated in home country • Supplementary R&D activities at other locations	**Type C** • Companies from large countries • Strong R&D and lead market in home country • 1 or 2 dominant R&D and innovation center(s) in lead market(s) • Close linkage R&D and product units
Small home country and/or large share of critical assets in foreign locations	**Type B** • Companies from small countries • Companies from large countries with deficiencies in R&D in this particular field • Establishment of multiple leading-edge R&D centers abroad • Key: critical mass of foreign R&D unit/reverse technology transfer	**Type D** • Companies from small countries • Companies from large countries with lead market deficiencies • Key: concentrate competencies outside the home country/ establish new business units

Source: Gerybadze & Reger (1999), p. 267

Figure: 31: Types of corporations and their dominant patterns of innovation

Applying this framework and the classification matrix on the case findings is relatively easy, because Gerybadze & Reger (1999) present the necessary interpretation themselves:

> *"US pharmaceutical and health corporations would have little incentive to go abroad for access to scientific results and research talents in this field. This is different for transnational corporations from small countries such as Switzerland, Sweden or the Netherlands. All Swiss corporations in our sample (Ciba-Geigy and Sandoz, now being renamed Novartis as well as Roche) have made strong inroads into US-based biotechnology research. The same was true for corporations from larger countries (Germany and Japan), who felt that the research infrastructure or regulatory conditions were less developed at home than in the US. Both types of corporations pursued a B-type strategy." (Gerybadze & Reger, 1999, pp. 266-267)*

This quotation[56] clearly supports the case findings as far as the motives for the acquisition of the U.S. biotechnology companies are concerned (Tentative hypotheses #1 and #2). Moreover, the concept of Gerybadze & Reger (1999)

[56] This quotation corresponds also quite well to the argument of zu Knyphausen-Aufseß & Zaby (2000) about the lack of adequate 'social systems' in a firm's home country that leads to internationalization to host countries where such 'social systems' are in place.

makes clear why the acquired biotechnology companies are considered as centers of excellence (Tentative hypothesis #12). However, the fact that no knowledge transfers between the acquired biotechnology company and the acquiring pharmaceutical company in the post-acquisition integration process takes place (Tentative hypothesis #11) is neither explicitly stated nor explained in this concept.[57]

Another interesting theoretical approach that provides some explanations for the fact that there is no real transfer of knowledge and capabilities from the biotechnology to the pharmaceutical company is presented by Teece (2000). His concept is based on the overall assumption that

> *"access complementary assets is stripping away traditional sources of competitive advantage, leaving knowledge and competence, coupled with dynamic capabilities (the firm's entrepreneurial and strategic asset orchestration capabilities) as the foundation of competitive advantage". (Teece, 2000, p. 3)*

This concept follows the logic that knowledge assets are grounded in the experience and expertise of individuals, while firms are providing the physical, social, and resource allocation structure, so that knowledge can be shaped into competencies.[58] This explains also why the people of the acquired biotechnology companies are an important asset and why pharmaceutical companies did not try to transfer this knowledge or relocate the people (Tentative hypotheses #11 and #13). In a further step, Teece (2000) points out that "the creation and use of

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[57] In their last section concerning implications for further research, Gerybadze & Reger (1999) ask the question why and when do multinational companies establish lead centers with global technology responsibilities at locations outside the home country. One answer to that question is provided by the case findings, because attributing the role of independent centers of excellence to the acquired biotechnology companies is the only way of keeping up the value of the biotechnology know-how and part of their innovative capabilities (Tentative hypotheses #12 and #13).

[58] Gupta & Govindarajan (2000) point out that one of the primary reasons why multinational companies exist is due to their ability to transfer and exploit knowledge more effectively and efficiently in the intra-corporate context than through external market mechanisms (Caves, 1971 & 1982; Ghoshal, 1987; Kindleberger, 1969; Porter, 1986; Teece, 1981). Despite this argument and the existing empirical studies that support this argument, the case findings revealed a complete different picture as there was no systematic knowledge transfer from the acquired biotechnology companies to the acquiring pharmaceutical companies.

know-how is what innovation is all about" (p. 35). Thus, it is also necessary to understand the institutional environment in which the creation and use of new industrial knowledge takes place best.

The general approach by Teece (2000) involves four different steps. *First*, the fundamental characteristics of technological development needs to be specified. Teece (2000) identifies seven basic factors of technological development: uncertainty, path dependency, cumulative nature along the path defined, irreversibilities, technological interrelatedness, tacitness, as well as imitability. *Second*, the factors that affect innovation and the creation of knowledge assets at the level of the firm need to be determined.[59] Teece (2000) has developed a framework that presents the various classes of variables having a potential impact on the rate and direction of firm level innovation, which is shown in the following Figure 32:

[59] Frost (2001) has carried out a study about the geographic sources of foreign subsidiaries' innovations and has come to the overall conclusion that "innovative search in foreign subsidiaries is driven by the interplay between the subsidiary's innovation strategy, its evolving technical capabilities, and its membership in the local knowledge sharing community" (Frost, 2001, pp. 120-121).

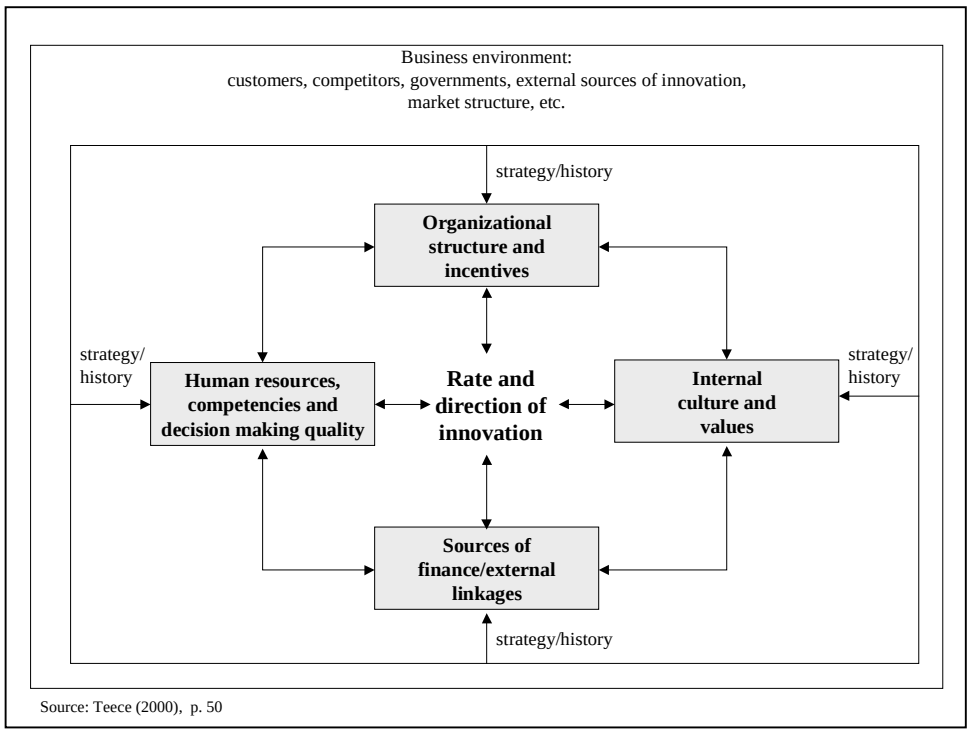

Figure 32: Determinants of the rate and direction of firm level innovation

This framework reveals that e.g. organizational structure or internal culture and values are considered as having a certain impact on the rate and direction of firm level innovation. For the further analysis, it is worth noticing that most of these determinants change due to an acquisition and the subsequent integration of the acquired company in the structure of the acquiring firm. Hence, this also affects the rate and direction of innovation. The question which then comes up is how different organizational structures and cultures do affect innovation and what kind of impact an acquisition does have.

In a *third* step Teece (2000) identifies distinctive archetypes and governance modes for firms. In this context, he focuses on four different archetypes that later will be matched with innovation. Multiproduct, integrated, hierarchical firms are the first archetype. Such companies can take on large projects and can help to set standards important to the continued evolution of a technology. Apart from that, they need any kind of alliance structures in order to tap into external sources of new knowledge. This explains also the M&A motives of large pharmaceutical companies (Tentative hypotheses #1 and #2) as they belong to this first archetype. The second archetype are high-flex 'Silicon Valley'-type firms, which are characterized by shallow hierarchies and significant local autonomy. Decision making in these firms is usually simple and informal. Communication and

coordination among functions is relatively quick and open and these firms are very likely to be highly innovative. Thus, by providing considerable autonomy and strong incentives, this organizational form has demonstrated that it can flourish in the context of rapid technological change. Biotechnology companies belong to this kind of archetype. The third archetype identified by Teece (2000) are virtual corporations that may have the capacity to be very creative and to excel at early-stage innovation activities. However, the virtual corporation is not seen to be a viable long-run organizational form, except in limited circumstances. The fourth archetype are conglomerates characterized by disparate units only loosely coupled through some kind of holding company structure. This archetype is not considered to offer distinctive advantages in environments with rapid technological changes. The further analytical focus of this study is limited to the first two archetypes as these are the two kinds that have been identified as relevant in the context of this study.

The *fourth* step of Teece's (2000) approach is to chose from available alternatives the organizational form that is better suited to deal with the necessary type of innovation and, by this, to match innovation and organizational archetype. This step is based on the distinction between autonomous and systemic innovation. On the one hand, autonomous innovations create improved products and processes that fit into existing systems and take place with known technologies. On the other hand, systemic innovations change the technological requirements and offer new opportunities as these innovations span current technology boundaries. Thus, the resulting configuration of both, the innovation and its related technologies, are different from what existed before. In addition to the distinction between autonomous and systemic innovation, the question of where the necessary capabilities exist must be taken into account. Combining these two dimensions with the different organizational forms the following matrix (cf. Figure 33) results:

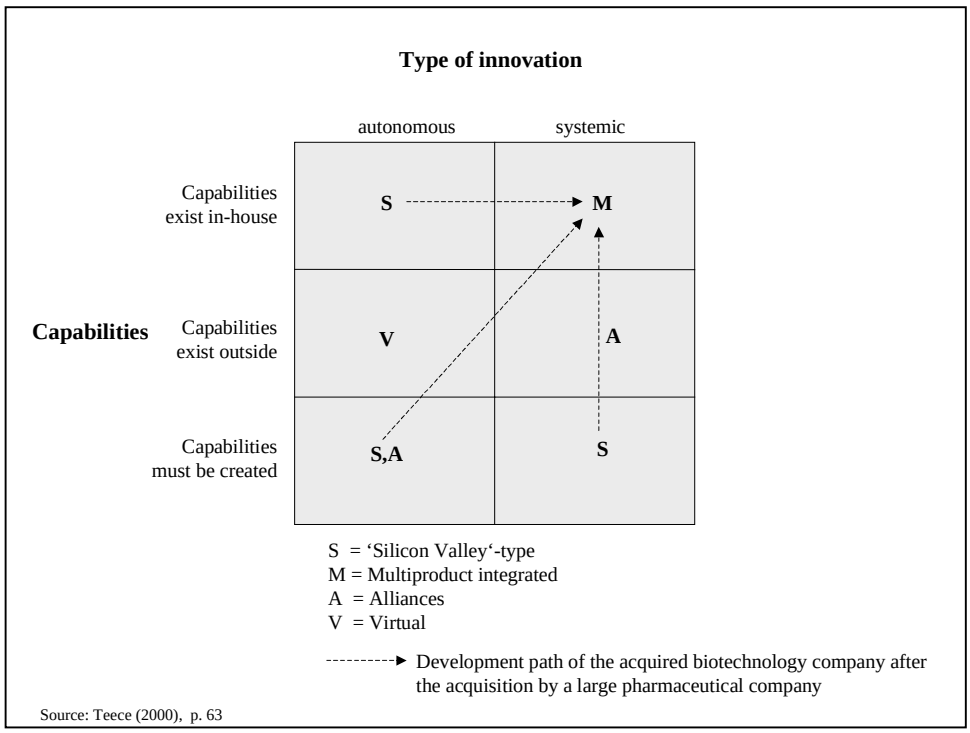

Figure 33: Matrix of innovation, capabilities and preferred organizational forms

For the purpose of this study only two organizational forms are of analytical interest: on the one hand, the 'Silicon Valley'-type of firm that represents the acquired biotechnology companies, and, on the other hand, the multiproduct, integrated, hierarchical companies, that represent the pharmaceutical companies. Accepting the argumentation and derived classification of Teece (2000), it becomes quite obvious that small, independent biotechnology companies can be considered as being stars as far as innovation is concerned. In contrast to this, the innovational power of pharmaceutical companies is rather 'limited' to systemic innovations based on capabilities that exist in-house. If a 'Silicon Valley'-type of company, in this specific case biotechnology companies, is acquired by a multiproduct, integrated, hierarchical company, which in the context of this study are represented by large pharmaceutical companies, the question comes up of what happens to these companies and their innovative capabilities. As a result of the acquisition, the biotechnology company becomes part of the pharmaceutical company and, thus, is no longer the small, dynamic, high-flex 'Silicon-Valley'-type of company. It has become part of the structure of a large, multiproduct, integrated, hierarchical firm, initiating a change in the determinants of the rate and direction of firm level innovation. This company is no longer characterized by shallow hierarchies and significant local autonomy in combination with simple

and informal decision making. Apart from that, this company no longer provides considerable autonomy and strong incentives, which represent the main characteristics that made it a company which was very likely to be highly innovative. After the acquisition, there is a clear evolution towards a multiproduct, hierarchical company which also has severe repercussions on the rate and direction of firm level innovation. In terms of innovation, the acquired biotechnology company develops itself to the field of the multiproduct, hierarchical company (cf. Figure 33) and provides no longer the different innovative capabilities that made the pharmaceutical company acquire it.

There are two subsequent questions that result from this analysis: (1) Are pharmaceutical companies aware of this problem? (2) What do they do in order to solve this dilemma? The answer to the first question simply is ‘yes’, pharmaceutical and biotechnology companies are both aware of that problem that result as a consequence out of the acquisition (Tentative hypotheses #15 and #16). Because of this, they try to grant the acquired biotechnology company as much autonomy and independence as possible (Tentative hypothesis #4). In addition to that, they are also aware of the big cultural gap between both kinds of companies (Tentative hypothesis #14). With the help of the overall autonomy strategy they try to set a structure in place that pretends the biotechnology company to still be an independent company. By this, the management of the pharmaceutical company hopes to preserve the innovative capabilities of the acquired biotechnology company as long as possible and to prevent them from transforming their structure and culture into that of a multiproduct, hierarchical company (Tentative hypotheses #4, #13, #14, #15, and #16). This attitude and strategy of the pharmaceutical companies also explain why they do not intend to transfer knowledge (Tentative hypotheses #11 and #13) and rather support and prefer the transformation of the acquired biotechnology company into centers of excellence within the structure of the pharmaceutical company (Tentative hypothesis #12). However, it cannot be ignored that, in the end, it is just a question of time until the acquired biotechnology company has become part of a large, multiproduct, hierarchical and integrated company. It can only be suppressed for a certain period of time (Tentative hypothesis #16). That is what pharmaceutical companies try to achieve by granting their acquired biotechnology company as much independence and autonomy as possible. The concept of Teece

(2000) has in fact no direct link to the literature about post-acquisition integration. However, this concept largely explains the logic and rationale behind the behavior of acquiring pharmaceutical companies. Thus, this concept will also be used when constructing the new approach of post-acquisition integration of small, high-tech companies in the structure of large corporations in the subsequent Chapter 5.

The argumentation of this theoretical concept of Teece (2000) can be supported by two empirical studies. Miller (1987) has carried out an empirical study that examined the relationship between strategy making and structure and their implication for performance. The structure of an organization heavily influences the flow of information and the context and nature of human interactions. Moreover, it channels collaboration, specifies modes of coordination, allocates power and responsibility, and prescribes levels of formality and complexity (Bower, 1970). Miller (1987) comes to the conclusion that when a firm is small, it may have a good deal of leeway in selecting and matching strategy making and structure and, by this, is more successful in terms of innovation. It was found that the relationships between strategy making and structure were usually strongest among successful and innovative firms and seemed to contribute the most to the performance in small and innovative firms. This view is related to the organizational structure in the sense of Teece (2000), which is one of the determinants of the rate and direction of firm level innovation. The leeway mentioned by Miller (1987) is gone after the acquisition by the large pharmaceutical company has been carried out. Hence, it might be expected that the acquired biotechnology company is less innovative as there is no real match between strategy making and innovation. The study of Chakrabarti & Souder (1987), which has already been briefly discussed before, has also come to the conclusion that corporations should be careful about imposing a bureaucratic organization on a newly acquired company, because organizational integration without an excessive increase in formalization was found to be the key to enhance the performance and not to endanger the innovative capability of the newly acquired company.

4.2.2.3 Cultural issues in the context of the post-acquisition integration strategy

The issue of culture is a widely discussed topic in the context of post-merger and post-acquisition integration, because ignoring a potential clash of cultures can lead to a failure of the acquisition (Engelhard, 1997). Too often, many acquisitions that initially appeared to be very promising from a number of viewpoints subsequently fail or require major surgery and extensive hand-holding as a result of neglecting critical cultural, personnel or organizational issues. However, this study is unable to cover the whole field in which a large number of concepts has been developed (Gertsen, Søderberg & Torp, 1998; Rohloff, 1994; Cartwright & Cooper, 1992 & 1993; Krystek, 1991; Körting, 1989; Reinecke, 1989; Buono, Bowditch & Lewis III, 1985; Deal & Kennedy, 1982; Ouchi, 1981; Peters & Waterman, 1982; Sathe, 1985; Smircich, 1983; Callahan, 1986). In this context, the focus can only be put on the most prominent and relevant concepts. The majority of the researchers within this field builds upon Schein's (1985)[60] classic understanding of culture as

> *"a pattern of basic assumptions – invented, discovered, or developed by a given group as it learns to cope with its problems of external adaptation and internal integration – that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems". (Schein, 1985, p. 9)*

The cross-case analyses revealed that differences in terms of country cultures as e.g. extensively analyzed by Hofstede (1980) does not play a role in this context. Because of this and also based on the globalization thesis of Levitt (1983), the

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[60] The concept of Schein (1985) is considered as being a very useful and practical way of analyzing cultures, which is to divide into three levels. Level one are artifacts which includes e.g. the architecture and design of the building or the office layout. This level is composed of the visible artifacts and behaviors within an organization. The second, deeper level of culture is composed of values held by members in an organization, that indicate what ought to be and determine what is considered acceptable. Some of these values are clearly stated and defined, whereas others are more fuzzy and less accessible. The third level of culture is composed of the basic assumptions resulting from an organization's success and failures in dealing with its environment. These assumptions make up the organization's basic philosophy and worldview and are the paradigm that guide all decisions and behaviors.

dimension of country cultural differences will not be discussed in the context of this study.[61] However, e.g. a study of Morosini, Shane & Singh (1998) provides empirical support for the notion that national cultural distance enhances cross-border acquisition performance. The case findings have only revealed that company cultural differences between the small, entrepreneurial-driven and high-risk-taking biotechnology companies, on the one hand, and the large, rather slow pharmaceutical companies, on the other hand, constituted a source of various problems.

As a starting point, it is worth having a look at Senn (1994) who has summarized some of the classic features as far as potential conflicting cultural qualities are concerned. He distinguishes between two different styles. The culture of *Style A* is highly participative, non-directive, informal and decentralized, whereas the culture of *Style B* is characterized as hierarchical, directive, formal and centralized. Applying these two styles on this study, *Style A* clearly corresponds to the culture of the biotechnology companies, whereas *Style B* depicts the culture of pharmaceutical companies. This big cultural gap between *Style A* and *Style B* does also exist between the biotechnology and pharmaceutical companies that have been part of this study (Tentative hypothesis #14). As a result of the M&A activity the cultures of both companies get – more or less – in contact with each other. Thus, the concept of acculturation is of interest in this context as it is central to the study of contacts between different cultures. The following quotation tries to give a definition of acculturation, a term that has been borrowed from anthropology and cross-cultural psychology:

> *"Acculturation comprehends those phenomena which result when groups of individuals having different cultures come into continuous first-hand contact, with subsequent changes in the original cultural patterns of either or both groups." (Redfield, Linton & Herskovits, 1936, p. 149)*

The concept of acculturation consists according to Barry (1980) of different forms of adaptations:

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[61] A little exception will be the brief discussion of the stock option issue, in which some differences between the U.S. and Europe matter.

- *Assimilation* implies that the non-dominant group relinquishes its identity.
- *Integration* means that the non-dominant group maintains its cultural integrity, but becomes at the same time an integral part of the dominant culture.
- *Rejection* occurs when the non-dominant group withdraws from the dominant culture.[62]
- In the case of *deculturation*, the non-dominant group loses cultural and psychological contact with both, its own original culture and the dominant culture.

Several management researchers (Cartwright & Cooper, 1992; Sales & Mirvis, 1984; Nahavandi & Malekzadeh, 1988 & 1993; Buono & Bowditch, 1989; Forstmann, 1994; Larsson, 1989 & 1990) have tried to transfer the basic idea of this concept to problem complexes linked to the cultural dimensions of mergers and acquisitions, some of these concepts will now be looked at a little bit more detailed.

In the study of Buono & Bowditch (1989) cultural differences are considered as one of the major reasons why mergers and acquisitions fail:

> *"One of the underlying reasons why mergers and acquisitions often fail to achieve the level of operational and financial performance predicted by precombination feasibility studies is the conflicts and tensions that emerge when companies try to combine disparate and frequently dramatically different cultures." (Buono & Bowditch, 1989, p. 134)*

From their point of view, organizational culture tends to be unique to a particular organization. Moreover, it is a powerful determinant of individual and group behavior. Thus, organizational culture affects practically every aspect of organizational life, from the way in which people interact with each other, perform their work, and dress to the types of decision and strategy making in a

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[62] In other concepts such as e.g. Nahavandi & Malekzadeh (1988 & 1993) rejection is also called separation.

firm. The full potency of organizational culture may be seen during a merger or acquisition when two disparate cultures are 'forced' to become one. Buono & Bowditch (1989) identify four main types of cultural merger or acquisition outcomes that also reflect typical organizational and operational merger implementation strategies at the same time:

- In the approach of *cultural pluralism*, based on the assumption that strength comes from diversity, cultural diversity and cultural subgroups are allowed to exist within the context of a shared strategy for growth and organizational success.

- *Cultural blending* attempts to create a blending or assimilation of two previously distinct cultures into a new, unified culture.

- In *cultural takeovers*, merger integration requires replacing the culture of the acquired company with the dominant culture of the acquiring company.

- *Cultural resistance* often emerges when there is a lack of mutual understanding of or attention to the cultures of the merger partners, resulting in a high level of management turnover, market-share shrinkage, and difficulties in achieving the desired synergies.

Buono & Bowditch (1989) discuss different recommendations and models of organizational culture change, mainly based on Sathe (1985), which however are not relevant in the context of this study as the acquiring pharmaceutical companies even attempted to do everything in order to preserve the culture of the acquired biotechnology companies (Tentative hypothesis #15). That is the main reason why they tried to grant the acquired biotechnology company as much autonomy and independence as possible. Thus, having a look at the different cultural strategies or outcomes that result from the acquisition, cultural pluralism, meaning that the acquired biotechnology company should keep their culture, is the desired outcome (Tentative hypotheses #14 and #15). Nevertheless, applying this strategy cannot sufficiently explain why the acquired biotechnology companies lose some of its culture, especially their entrepreneurial spirit. This happens just because of the simple fact that they have been acquired and are no longer an independent, sometimes publicly traded company. Consequently, even if – theoretically – there is no contact at all between the acquiring pharmaceutical

company and the acquired biotechnology company and, by this, no exchange between the two cultures, the biotechnology company will lose its entrepreneurial spirit, simply because their nature of existence changes (Tentative hypothesis #16). This is something that cannot be prevented from happening. Pharmaceutical companies can only try to slow down this transformation process by granting the acquired biotechnology company as much autonomy and independence as possible (Tentative hypotheses #14, #15, and #16).

Nahavandi & Malekzadeh (1988 & 1993) have developed another interesting framework for analyzing the role of organizational culture in the context of mergers and acquisitions as they consider it as a potential risk to the success of mergers and acquisitions which becomes clear form the following statement:

> *"It is essential, however, to consider cultural and human factors as part of the definition of success of a merger. [...] The influence of culture on organizations is difficult to measure and predict. [...] That culture represents the shared values and norms of the employees. It is what makes the company unique, the glue that bonds people together. Giving it up is equivalent to surrendering one's identity, and consequently, employees often fight to preserve it." (Nahavandi & Malekzadeh, 1993, p. 3)*

In order to handle this problem, they have developed a model for the three types of cultural adaptation processes preferred by the acquired and acquiring firms. Obviously, a lack of agreement between the preferences of the acquirer and the acquired might result in problems. Based on Barry's (1980) concept of acculturation the same different modes of acculturation can be distinguished. Nahavandi & Malekzadeh (1988 & 1993) suggest that the choice of the mode of acculturation for the acquired company will depend (1) on the strength and success of its own culture and on how much its employees and managers want to preserve it, and (2) on the perception of the attractiveness of the acquirer. The second factor refers to the question to what extent do members of the acquired firm admire and value the culture, managerial style and philosophy, and performance of the acquirer. The different options for the acquired firm are summarized in the following Figure 34:

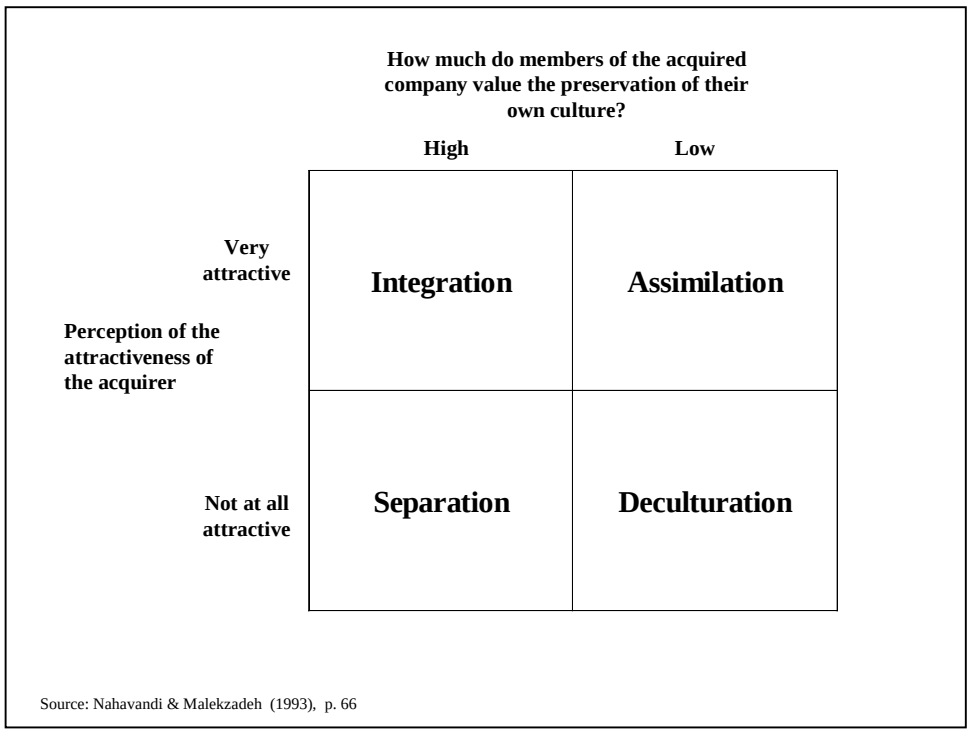

Figure 34: The *acquired* firm's preferred adaptation process

From the point of view of the acquirer, the selection of the appropriate mode of acculturation depends (1) on its strategy and (2) on its culture. The second factor refers to the degree to which the acquirer is multicultural. The combination of the two factors, depicted in the following Figure 35, determines which mode of acculturation should be implemented.

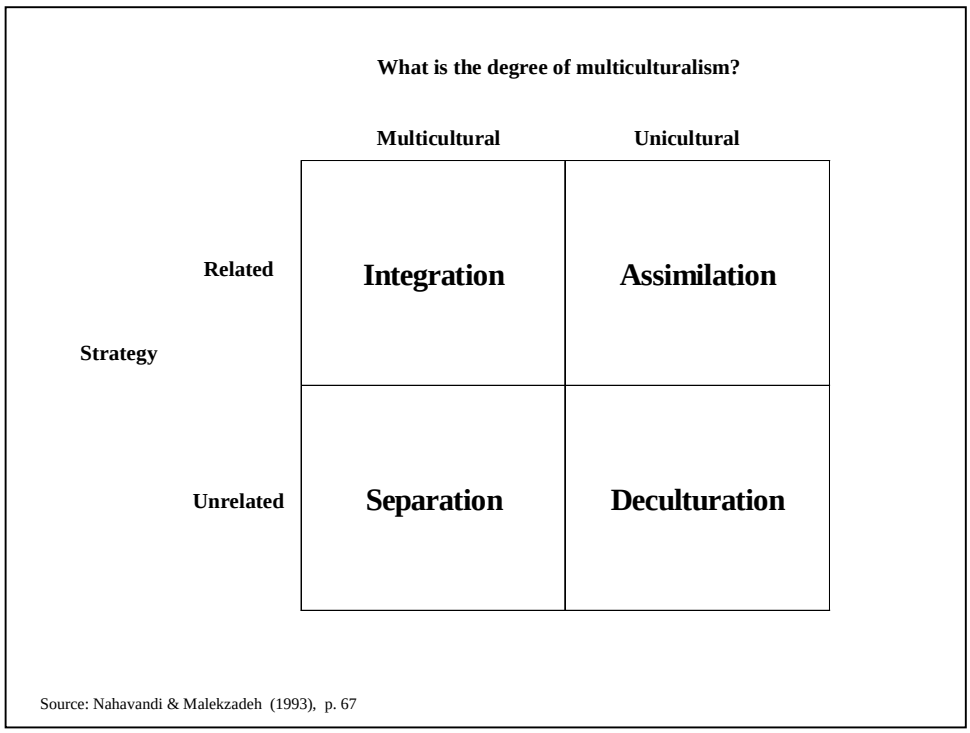

Figure 35: The *acquiring* firm's preferred adaptation process

At this point, it is necessary to apply this concept to the biotechnology and pharmaceutical companies observed in the context of this study. On the one hand, employees of the biotechnology companies clearly would like to preserve their culture. That is of course rather a easy conclusion. However, it becomes more difficult, when judging the perception of the biotechnology companies vis-à-vis the pharmaceutical companies in terms of attractiveness. The acquirer is neither considered as very attractive nor as not attractive at all. In fact, it is a mixture of both, because biotechnology companies desperately need the money and support by pharmaceutical companies (Tentative hypothesis #3) irrespective of the question whether they judge the acquirer as very or low attractive. They simply have no choice. On the other hand, pharmaceutical companies know that biotechnology companies have a different culture and also want that they preserve this culture (Tentative hypothesis #15). Thus, they can be considered as multicultural.

From the point of view of strategy, it is very difficult to say whether the activities are related or not. Again, it is a mixture of both, because part of the business and the activities of the biotechnology companies such as sales or marketing is very related to the business of the pharmaceutical company. However, most of the research that is performed at the biotechnology companies is rather unrelated to

the pharmaceutical company as they do not have the necessary knowledge to continue these activities. (If they had that knowledge, they would not need to acquire the biotechnology companies.) Therefore, irrespective of whether the overall strategy is more related or unrelated, they had to opt for ‘separation’ (Tentative hypothesis #14).

The discussion and comparison of this concept with the case findings reveals that it is not easy to make clear statements and recommendations. All in all, the concept of Nahavandi & Malekzadeh (1988 & 1993) seems not to be appropriate for the cases as it cannot really help and explain the observations made in the case studies. From the very beginning, both sides were aware of the fact that due to the big cultural gap the biotechnology company should be granted as much autonomy and independence as possible (Tentative hypothesis #14). In order to make that decision they did not have to use such a concept. Moreover, the concept of Nahavandi & Malekzadeh (1988 & 1993) is unable to explain the transformation (the loss of the entrepreneurial spirit) in the culture of the biotechnology company that appears over time (Tentative hypotheses #15 and #16).

After having analyzed two prominent concepts in the context of organizational culture in combination with mergers and acquisitions, it turned out that these concepts were not able to explain the cultural transformation from an entrepreneurial-driven company into a research- and discovery-focused company as postulated by tentative hypothesis #16. The questions which consequently arise are whether the loss of the entrepreneurial spirit even matters and why it is not possible to continue the entrepreneurial spirit in large, multiproduct and integrated pharmaceutical companies. These questions can be answered by relying on an empirical study of Covin & Slevin (1988), which examined the influence of organization structure on the relationship between top management’s entrepreneurial orientation and financial performance. The entrepreneurial style is of course a multidimensional concept which applies to organizations as well as

to individuals (Stevenson, Roberts & Grousbeck, 1985).[63] The entrepreneurial orientation, or in other words spirit, of a company is demonstrated by the extent to which the top managers are inclined to take business-related risks to favor change and innovation in order to obtain a competitive advantage for their firm, and to compete aggressively with other firms (Miller, 1983). Hence, entrepreneurial spirit may – from the point of view of this study – be characterized by a risk-taking and an innovation dimension which corresponds to tentative hypothesis #15.

In a further step, Covin & Slevin (1988) follow the differentiation of Burns & Stalker (1961). On the one hand, the organizational structure according to organic structures is characterized by aspects such as flexibility and informality which facilitate innovation, whereas on the other hand, mechanistic structures are characterized by rigidity in administrative relations and formality, and were said to impede innovations. In the context of this study, biotechnology companies would be attributed an organic structure, whereas pharmaceutical companies would rather be judged as having a mechanistic structure. The findings of Covin & Slevin (1988) suggest that an entrepreneurial top management style has a positive effect on the performance of organically-structured firms and a negative effect on the performance of mechanistically-structured firms. This conclusion explains why it is even better for the acquired biotechnology company to lose some of its entrepreneurial spirit as it does not fit with the mechanistic structure of a big pharmaceutical company. Moreover, it also explains why a lot of the entrepreneurial orientated top management people leave (Tentative hypothesis #17). They do not longer fit into the new structure which launches this adaptation process. Furthermore, the results of their study indicate that organic structures promote entrepreneurial activities and innovation. Because of this, it becomes also clear why pharmaceutical companies try to keep up the specific entrepreneurial spirit of the biotechnology companies by granting them the necessary autonomy (Tentative hypotheses #4 and #14). However, as the case

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63 Of course, this study cannot cover the complete literature that exists in entrepreneurial research. However, it is necessary to point out the importance of these entrepreneurial concepts as the change in the entrepreneurial spirit ultimately affects the nature of the biotechnology company. In order to demonstrate its importance the study of Covin & Slevin (1988) was chosen as an appropriate reference.

findings reveal, the pharmaceutical companies are in a dilemma situation, because this is only a temporary solution (Tentative hypotheses #15 and #16) and the nature of the biotechnology company ultimately will change over time, irrespective of what means are set in place.

Apart from the concepts studied so far, there are also some other empirical studies that show the importance of culture in the context of mergers and acquisitions. Most of these studies (Graves, 1981; Levinson, 1970; Costello, Kubis & Schaeffer, 1963) examined the cultural fit of the buying and selling firms and its impact on the combination of both companies, but they have not examined the effects of cultural fit on the corporate financial performance. These studies have only selected a fragmented set of criterion variables such as employee motivation or attitudes. This gap is closed by a study of Chatterjee et. al (1992) which has analyzed the relationship between shareholder gains and the relatedness of merging firms upon the compatibility of the two firms' top management culture. The findings suggest (1) that the management of a buying firm should pay at least as much attention to issues of cultural fit during the pre-merger search process as they do to issues of strategic fit and (2) that the integration needs to proceed carefully in order to reap any anticipated synergies. The findings of this study support the outcomes of the cases analyzed in the context of this study. Both sides, biotechnology as well as pharmaceutical companies, are aware of the fact that there is a big cultural gap between them and that they cannot really bridge this gap. Moreover, they know that the specific culture of the biotechnology company is also an asset by itself, which will disappear over time (Tentative hypothesis #16). Thus, they vote for the only reasonable solution and try to keep both entities separated by granting the acquired biotechnology company as much autonomy and independence as possible aiming at preserving the culture of the biotechnology company as along as possible (Tentative hypothesis #14).

4.2.2.4 Human resources related issues of the post-acquisition integration process

The human side of mergers and acquisitions is too often glossed over or ignored; yet nothing is more important to successful acquisitions, because one can

purchase capital shares of a target company, but one cannot purchase people – at best, one can only rent them for a time. Marks (1982) depicts this situation as follows:

> *"Buying a corporation means acquiring capital, equipment, buildings, products, and patents; it also means acquiring organizational structures with their people, attitudes, behavior, management styles, policies, and climate." (Marks, 1982, p. 40)*

This is even better expressed in the following quotation:

> *"And since the best and brightest find it easiest to land another job quickly, the rule of thumb is that the people you can least afford to lose will be the first to go." (Geber, 1987, p. 30)*

Thus, researcher and practitioners have become increasingly concerned about the effects of mergers and acquisitions on employees (Bastien, 1987; Buono & Bowditch, 1989; Graves, 1981; Hirsch, 1987; Invancevish, Schweiger & Power, 1987; Marks & Mirvis, 1985; Marks, 1982; Gerpott, 1990; Müller-Stewens, 1991; Napier, 1989; Napier, Simmons & Stratton, 1989; Davy et al., 1988; Schweiger & Denisi, 1991; Cartwright & Cooper, 1990 & 1992; Hunt & Downing, 1990; Hermsen, 1994; Jansen & Pohlmann, 2000; Trauth, 2000). As a consequence of this, it is necessary to analyze what happens to human resource related issues in the post-acquisition integration management. One of the most important issues in the context of post-merger analysis deals with people's uncertainty (Davey et al., 1980; Davy et al., 1988; Schweiger & Denisi, 1991; Schlieper-Darnich, 2000) which is also reflected in the following quotation:

> *"Mergers generate a tendency for employees to shift their focus from day-to-day business need to internal politics surrounding a merger process. Enmeshed in the insecurity that change presents, they thus become risk averse. At a time when a newly formed organization needs its people to be the most creative, the staff becomes reluctant to share ideas." (Mozeson & Gretchko, 1998, p. 15)*

The book *'The human side of mergers and acquisition'* of Buono & Bowditch (1989) is about the impact that mergers and acquisitions have on people in the workplace, the psychological difficulties that people experience, the culture

clashes that can emerge in organizations during the post-merger integration period, and the ways these problems can be managed. In this context, there is also an extensive discussion of uncertainty, ambiguity, tension, and anxiety (Marks & Mirvis, 1985 & 1986; Mirvis & Marks, 1985; Pritchett, 1985 & 1987) that may lead to individual merger traumas and the need to handle the individual stress associated with that. However, these often found problems did play absolutely no role in the context of the M&A deals between pharmaceutical and biotechnology companies, because the acquiring companies wanted to keep all employees of the acquired companies. Thus, these issues will not be discussed in further detail.

Shea & Vaught (1994) consider employee compensation and benefit plans among key components of any acquisition strategy. They regard a number of variables that must be looked at when integrating the compensation and benefit plans of the merged companies. In the context of compensation there are salaries and wages, annual incentive and employee bonus awards, long-term incentive and stock awards, employment contracts as well as prerequisites. Benefits are such things as retirement plans, health care plans, other welfare plans as well as labor agreements. Besides the necessity to integrate the different plans of the two companies, Shea & Vaught (1994) make an other interesting proposition:

> *"If the acquired/merged companies are in totally separate locations and it is anticipated that such locations will remain totally separate, it could be argued that the benefit and compensation plans for each location should remain as they are for competitive reason." (Shea & Vaught, 1994, p. 249)*

That is more or less the strategy which is applied by the pharmaceutical companies, as the overall integration strategy is to keep up the independence and autonomy of the biotechnology companies. Thus, besides the change in the stock option programs, which will be discussed later, the incentive systems basically remain the same and are even improved as additional incentives and bonus programs were introduced in order to make people stay (Tentative hypothesis #20).

The importance of the human resource issue in the context of post-merger integration becomes clear when analyzing the impact of mergers and acquisitions on the turnover (Krug & Hegarty, 2001). In a first study, Walsh (1988) has

investigated top management turnover following mergers and acquisitions and has come to the conclusion that top management turnover rates following a merger or acquisition are significantly higher than normal top management turnover rates. This overall conclusion is also supported by an empirical study of Crouch & Wirth (1989) which investigated the effects of mergers on the retention of managers, or a study carried out by Hayes (1979). In a further study, Walsh (1989) has investigated how the merger and acquisition negotiations affect the retention of a target company's top management.[64] The results indicate that when a buyer approaches an unrelated company which has been subject to previous takeover interests with a merger proposal, and an agreement is reached, the target's management team is likely to experience abnormally high turnover four years later.

Comparing the findings of both studies with the case findings, one can state that there is also an abnormal turnover which occurs immediately after the acquisition has been carried out (Tentative hypothesis #17), because most of the people can no longer fulfill their entrepreneurial aspirations and, thus, decide to leave the company. However, the pharmaceutical companies are aware of that problem which has already been pointed out by the introductory quotation of Geber (1987). Therefore, they try to ensure that at least one or two key people of the top management stay in order to build the post-acquisition integration process on them (Tentative hypothesis #18). This problematic situation is also supported by the view of Stevenson & Gumpert (1985) who noted that a manager with an entrepreneurial focus will favor a flat organization structure with informal networks, whereas a manager with a rather administrative or conservative focus will prefer an organizational structure characterized by clearly defined authority, responsibility and formal hierarchy. This explains why most of the top management of the biotechnology companies prefers to leave the company and,

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[64] In a subsequent study of Walsh & Ellwood (1991) the role that mergers and acquisitions might play in the disciplining of entrenched and inefficient managers was investigated. Their results reveal that the target company's top management turnover is higher than normal in the two years immediately following a merger or acquisition. There was no relationship found between the previous target company performance and its subsequent top management turnover.

by this, gives a possible explanation for the increase in turnover (Tentative hypothesis #17).

So far, the confrontation of theories about the issues of human resources in post-merger integration with the case findings has neither come up with any kind of major problems nor anything particular new. However, one of the major problems that pharmaceutical companies encountered during the post-acquisition integration was the issue of stock options. In order to understand and explain this, an additional dimension needs to be taken into account. It is the fact that the acquiring pharmaceutical companies are of European origin while having major affiliates in the U.S. and the acquired biotechnology companies are all of U.S. origin. That is the only point at which a differentiation according to the origin of the companies plays a major role. In U.S. biotechnology companies, stock options are part of the culture and are taken for granted. In the U.S., a publicly traded biotechnology company without a stock option program that more or less involves all employees is in fact unthinkable and does merely exist. As a consequence of this, the acquiring pharmaceutical companies had severe problems in attracting and retaining employees (Tentative hypothesis #19). Thus, they tried to bypass this by offering special incentives and additional bonus programs (Tentative hypothesis #20).

For the time being, there is only one study of Inkpen, Sundaram & Rockwood (2000) that tried to analyze the issue of stock options as part of a larger study about cross-border acquisition of U.S. technology assets located in the Silicon Valley.[65] The goal of their study is to examine cross-border technology acquisitions with a focus on post-acquisition integration and corporate governance issues, which also makes their analysis as a whole interesting for this study.

In a first step, they try to characterize the companies according to their key cultural characteristics. Their first characteristic is their entrepreneurial culture

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[65] Other aspects that are analyzed in the study of Inkpen, Sundaram & Rockwood (2000) can also be found in other articles. E.g., Eckert & Engelhard (1999) develop a capital structure theory for the multinational company, which is clearly related to the corporate governance issues discussed by Inkpen, Sundaram & Rockwood (2000).

driven by innovation and commercialization of new ideas, which fits very well with the culture of the biotechnology companies analyzed in the context of this study. (In fact, some of the analyzed companies are also located in the Silicon Valley.) Second, there is learning through failure and third there is the nature of the labor market with an extraordinarily high level of labor mobility which corresponds to the high level of turnover observed in the cases (Tentative hypothesis #17). In their study, four organizational factors emerged as important drivers for successful post-merger integration: speed in integration and the nature of decision making, acquirer communication styles and visions, networking and socialization, as well as the target employees' sense of who is in charge. Compared with the findings that came up while analyzing the post-merger integration between pharmaceutical and biotechnology companies, the issues identified by Inkpen, Sundaram & Rockwood (2000) did only play a minor role, because the overall integration strategy was to grant the acquired biotechnology companies as much autonomy as possible. Thus, these topics will not be discussed in further detail although occasionally there might have been some problems in terms of decision making as far as e.g. the Merck-Lexigen case was concerned or in the communication that took place between Bayer Diagnostics and Chiron Diagnostics.

Besides the integration challenges, Inkpen, Sundaram & Rockwood (2000) identified four important corporate governance-related issues: differences in compensation structures between Silicon Valley firms and the acquiring companies, the nature of the acquirer's ownership structure, the role of M&A in the acquirer's strategy process, as well as the role played by some of the key stakeholders, especially banks. In the deals between biotechnology and pharmaceutical companies, the ownership structure, the role of M&A in the overall strategy process and the influence of major shareholders had no real impact. However, the differences in the compensation system, especially the non-existence of a stock option program turned out as being very problematic. Hence, this will be discussed a little bit more detailed in the following paragraph.

Inkpen, Sundaram & Rockwood (2000) point out:

> *"In a start-up, much of an individual's compensation is in the form of stock options, which align individual and organizational goals and generate intense*

> *commitment on the part of the employee for the success of the venture. [...] In Silicon Valley, stock option are taken for granted. This has created a major problem since few non-Anglo-American firms have stock option plans." (Inkpen, Sundaram & Rockwood, 2000, p. 61)*

Most of this quotation hits the point quite well, because the acquiring pharmaceutical companies being of European origin had problems in attracting, motivating and retaining employees after the stock option programs disappeared (Tentative hypothesis #19). In order to make up for the loss of the stock option programs they introduced other programs (Tentative hypotheses #19 and #20) like phantom option or stock appreciation right plans (e.g. Novartis), which are only of virtual character and did not provide ownership. Again, the case findings as well as the conclusions of Inkpen, Sundaram & Rockwood (2000) reveal that this mainly created dissatisfaction among employees.

Nonetheless, their study has also some misleading statements. First and foremost, it is not true that only "few non Anglo-American firms have stock option plans". They try e.g. to support their statement with an example of Daimler-Benz (now: DaimlerChrysler) taken from 1996. In fact, that is history, because at the 1st of September 1998 a law was passed in Germany which makes it much easier for German companies to issue stock options. Based on this law, which is called KonTraG (Law for control and transparency in companies)[66], it is for the first time possible for German companies to issue naked warrants (Schweizer, 2000; Achleitner, 1999; Achleitner & Wichels, 2000). After this law was passed there was a dramatic increase in the number of stock option plans, especially in companies that were listed at the 'Neuen Markt', the German equivalent to the NASDAQ or the 'Nouveau Marché' in France (Schweizer & zu Knyphausen-Aufseß, 2001).

Moreover, Inkpen, Sundaram & Rockwood (2000, p. 62) stated that

> *"European acquirers that maintained stock option plans had difficulties with the structure of the plans. For example, in one company, existing target options were converted to options on the European company's stock, which was worth less per*

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[66] KonTraG means 'Gesetz zur Kontrolle und Transparenz im Unternehmensbereich'.

share and growing at much slower rate than the target company's stock had been growing".

As far as the exchange of target options in options of the acquiring company's stock is concerned, that is normally not a question of 'pure' numbers, but a question of the value of the options. Based on the valuation of the options respectively the stock, the corresponding exchange rate is calculated and the exchange takes place. That is the normal procedure, by which no loss in value occurs. The fact that this stock is growing at a much slower rate than the target's company stock is, in a first step, nothing what one can rally predict and, in a second step, it is simply a fact that cannot be changed. But, that is definitely not a problem of the structure of such a program, because the stock price is only a reflection of the market valuation of the company. Since the acquired company is no longer an independent, publicly traded company, this fact simply must be accepted. If people cannot accept this, they will have to leave the company, which is also consistent with tentative hypothesis #19.

This reflects also what this whole study is about, because after the acquisition the nature of the company changes. The acquired biotechnology companies as well as the companies in the sample of Inkpen, Sundaram & Rockwood (2000) are no longer independent companies – although pharmaceutical companies try to pretend that – at least at the beginning. They definitely need to face the fact that they are no longer the entrepreneurial driven, high-risk taking start-up companies as they were before. They are now part of larger corporation and have – at least to some extent – to play according to other rules. The change in the incentive compensation structure is part of this transformation process, small high-tech companies must undergo after the acquisition.

4.3 Discussion of the organization of the post-acquisition integration process

After having extensively discussed and analyzed the more content-orientated perspective of the organizational integration in the previous sections, the analytical considerations and conceptual ideas of this section focus on the process-perspective of the organizational integration process. This refers to the investigation of how the overall integration process is organized in order to realize the different integration issues discussed so far, because the real value potentially realized through the acquisition is created by conscious and professional management of the newly acquired entity after the act of buying.

The organization of the integration process has been described in many studies by consultants as well as by researchers (Storck, 1993; Clever, 1993; Jansen, 1998; Freund, 1991; Rohloff, 1994; Galpin & Herndon, 2000; Spickers, 1995; Deiser, 1994; Werner, 1999; BCG, 2000; Booz·Allen & Hamilton, 1999; Feldman & Spratt, 1999; Habeck, Kröger & Träm, 2000; Picot, 2000). Because of this large amount of research, only the most relevant parts can be taken into account in the context of this study. All these models and concepts generally distinguish between different phases and are more or less relatively similar. The overall objectives of the integration process become clear in the following quotation, which is taken from BCG guidelines for making a merger work:

> *"Manage the merger as a discrete process. Create project teams, separate from the core business, to handle the merger. This approach will minimize – but not eliminate – the merger's effects on both customers and business as usual. Carefully design a clear structure and set principles for the merger. Give managers overseeing the process a mandate to make and implement decisions quickly." (BCG, 2000, p. 5)*

Companies being combined after an acquisition must be coordinated through some kind of project team that has been given clear roles, responsibilities, and expectations. Such a model that especially puts its emphasis on the organization of the post-merger integration process has been developed by Galpin & Herndon (2000) and is shown in the following Figure 36:

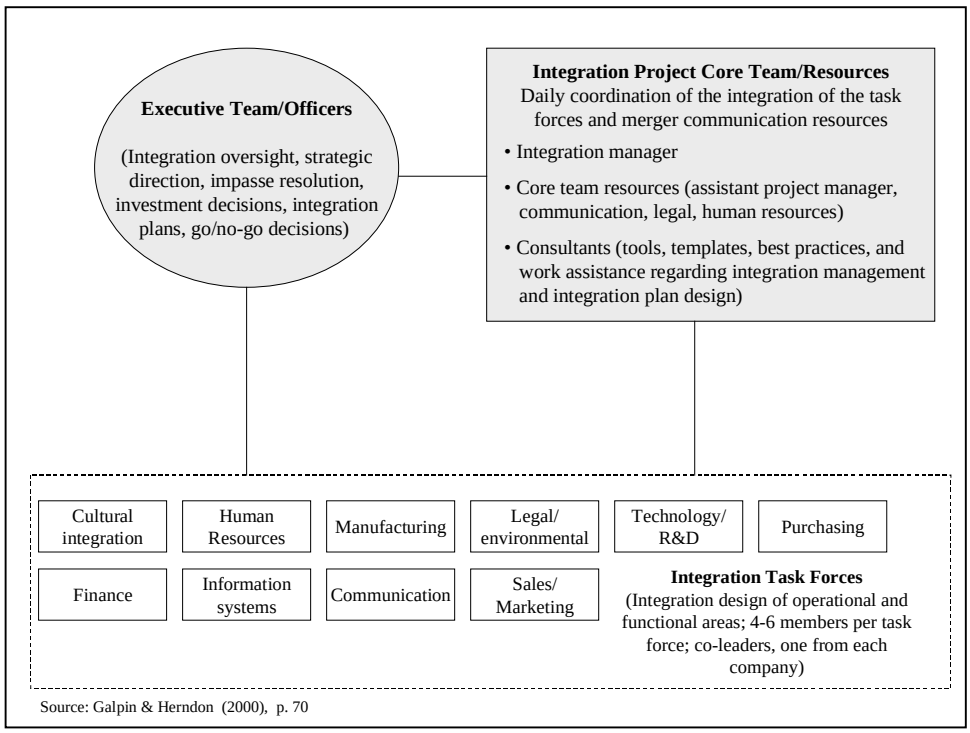

Figure 36: Common planning model for the integration process

As this model suggests the top executives of the acquiring organization have the ultimate accountability for the success of the integration which corresponds to the findings in tentative hypothesis #22. They are actively positioned throughout the process in order e.g. to provide strategic direction, resolve impasses, and provide oversight to the core integration team. The integration's project team assumes primary responsibility for the day-to-day coordination of the task forces and the overall process and may also rely on the help of external consultants (Tentative hypothesis #24). The job of the integration project team is considered as a full-time role which involves overseeing the establishment of the task forces, managing the selection of the task force leaders, arranging the kick-off sessions, as well as ensuring effective coordination between and among the task forces (Tentative hypothesis #23).

In this concept, which is primarily designed for the combination of two larger entities, the role of the integration manager is to serve as a support for the realization of the tasks of the integration's project team. In this context, his individual knowledge of the business and his ability to lead people and serve as a change agent are of crucial importance. Apart from that, the concept of Galpin & Herndon (2000) also suggests that if the project manager is selected from the acquiring company, the assistant project manager should be selected from the

acquired organization, which perfectly goes along with the interpretation and realization of such a deal as a ‘merger of equals’ (Tentative hypothesis #23). The task forces, like the core team, should include balanced representation from both partner companies. Integration task forces make up the majority of the integration infrastructure and are primarily responsible for designing transition plans, capturing synergies, and implementing the action items required for successful business integration. However, in the context of this study integration task forces did not play a very important role as the acquired biotechnology companies were rather small. Because of this, there were generally only a few executives from the acquiring pharmaceutical companies sent to the biotechnology companies in order to make them familiar with the structures and processes in place in the pharmaceutical companies (Tentative hypothesis #23).

Once the decision about how to tackle the organizational integration issues has been made, the stage needs to be set for the actual organizational implementation of the merger. This phase is characterized mainly by initiating, steering and monitoring the realization process between all areas of the company and all groups of employees concerned. For efficient and effective implementation of a merger, it is necessary to systematically plan this process. The following Figure 37 describes the main steps of the post-merger integration process according to the approach of Roland Berger Strategy Consultants (1999):

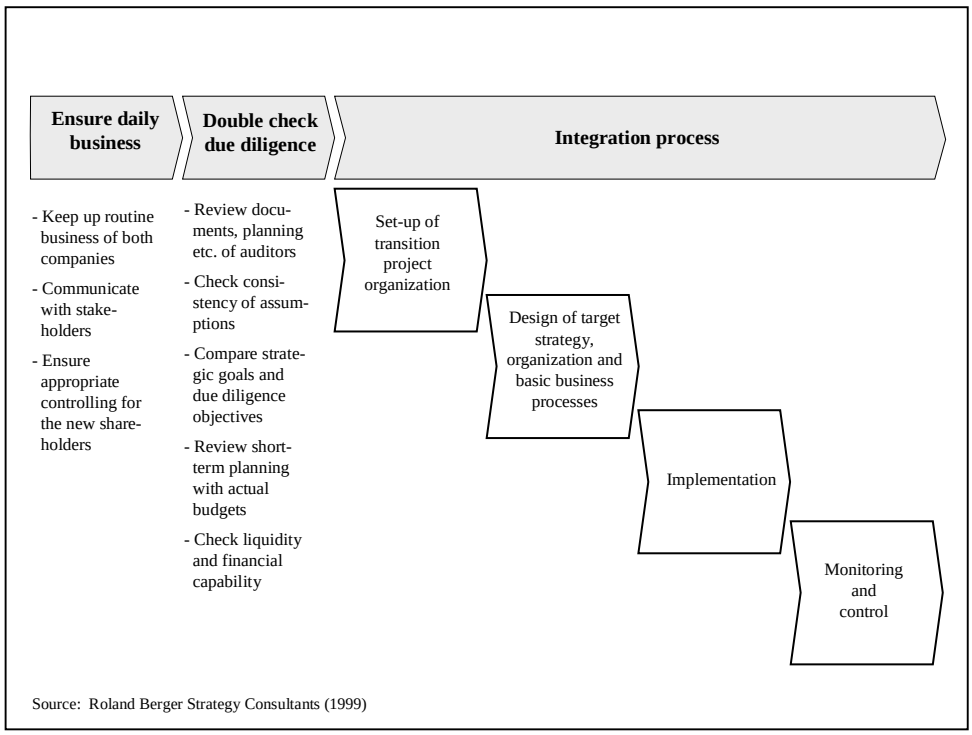

Figure 37: Steps of the post-merger process

In Figure 37 the post-merger integration process is divided up in three major steps. The first two steps, ensuring daily business as well as double check due diligence, are rather complementary steps in the post-merger integration process as they are necessary basic conditions. The third step, the real integration process, is the most central one. The following Figure 38 gives a more elaborated picture of how the different tasks of the four integration subjects are supposed to look like.

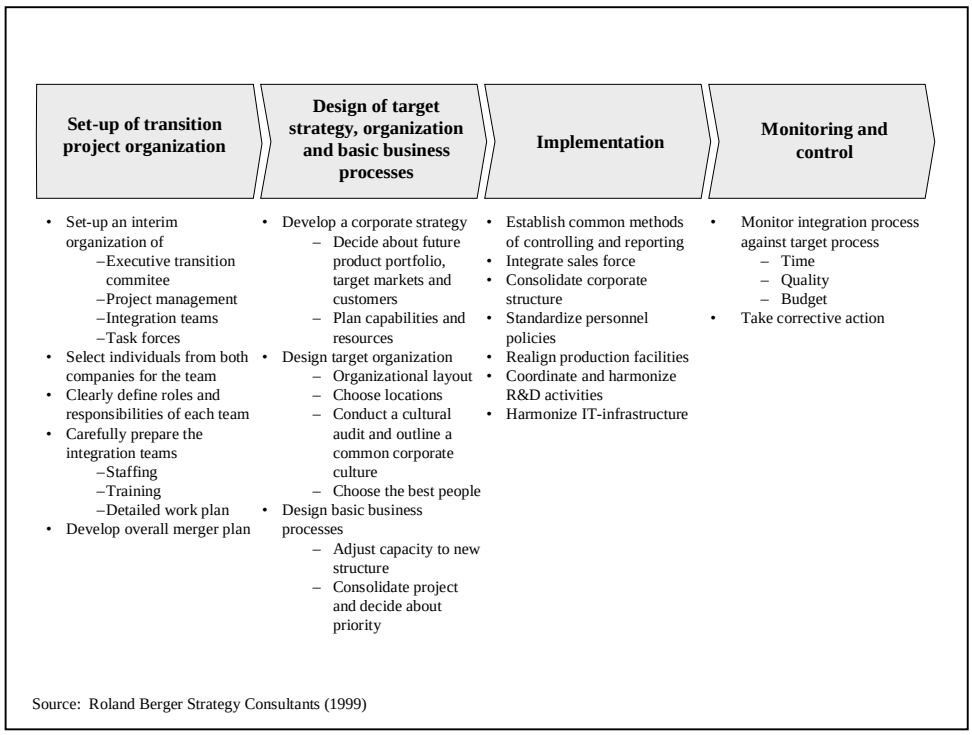

Figure 38: Detailed steps of the post-merger integration process

In a first step, the necessary transition project organization needs to be set in place and serves as a framework for the total project process. Special attention must be paid to the composition of the teams, which should consist of members from both organizations. Basically, the set-up of the transition project organization is the same procedure as observed in case studies. However, the structure that has been set in place in these deals is by far not that elaborated since the size of the acquired biotechnology companies is rather small (Tentative hypothesis #23). The second step, the design of the target strategy, organization and basic business processes, has already been discussed before in the context of the organizational integration topics. At this point, the structure, in which these decisions are shaped and finally implemented, as pointed out under step three, becomes clear. The fourth step refers to the monitoring and control of the post-merger integration process. The general framework described is one possible way for the realization of the organizational integration topics and fits quite well with the case findings. In fact, that is not very surprising, as it is a standardized procedure or tool that helps organizing such a process. Nevertheless, it needs to be tailored to each acquisition, which implies that specific alignments to a given situation are always necessary.

The issue of communication during the post-merger integration process has also been attributed a certain importance (Salecker, 1995; Schweiger & Denisi, 1991; Davy et al., 1988; Bastien, 1987; Müller-Stewens, 1991; Habeck, Kröger & Träm, 2000; PricewaterhouseCoopers, 2000), because any failure to communicate leaves employees uncertain about their futures. Davy et al. (1988) have pointed out some guidelines in order to increase the effectiveness of communication and to reduce uncertainty and ambiguity among employees:

- Information should be timely.
- Information should be comprehensive and not exceed the facts known to management.
- Information should be repeated in many media such as newsletters, memos or meetings.
- Communication must be perceived as credible by employees.
- The rationale for organizational changes should be communicated.
- The communication program needs to be well planned.

Compared with the case findings, most of these guidelines were followed (Tentative hypothesis #25). The empirical study of Schweiger & Denisi (1991) reveals that effective and timely communication reduces the dysfunctional outcomes of a merger. Due to the fact that the acquired biotechnology companies were not that big, most of the communication was done on a personal face-to-face base. In addition to that, there were of course also general speeches given by the top management in order to inform the employees. All in all, the management at the biotechnology companies was aware of the importance of the communication issue and did handle it effectively.

There are also differences in terms of speed with which change and integration are introduced, once the deal has been formalized (Cartwright & Cooper, 1992; Gerpott, 1993; Gut-Villa, 1997; Hermsen, 1994). It is difficult to place any exact time scale on the merger or acquisition process. PricewaterhouseCoopers (2000) have conducted a survey of mergers and acquisitions in order to identify the factors that separate success from failure. Their findings suggest that speed

increases the success rates. From this, the following results and recommendations were derived:

- While all companies in the survey had differences in operating philosophies, management practices and information systems, those that made faster transitions had significantly fewer problems in each area than those transitioning more slowly.

- Companies using a faster post-deal transition process were far more likely to be financially and strategically successful, because a prolonged transition adds costs, slows growth, destroys profit, and decreases cash flow.

- As transition speed reduces the duration and depth of post-deal depression, fast-transitioning companies were found to be twice as likely to improve performance than slow transitioning ones.

- A speedy transition improves the work environment as the uncertainty and insecurity of the employees about their job are reduced earlier. On a higher level, it is easier to define the direction of the acquired or merged company.

Confronting the findings of the PricewaterhouseCoopers (2000) study with the observation made in the case studies, the conclusions are not that straightforward. As far as the last recommendation is concerned, the reduction of uncertainty and especially the definition of the future direction of the acquired company, this is supported by tentative hypothesis #26. However, the overall conclusion that speed makes the difference and increases the success rates cannot be supported by the case findings. Quite the reverse was observed, e.g. in the deal between Sugen and Pharmacia in which a slow integration process intentionally was chosen. This was done in order to realize a stable integration process.

Moreover, the decision for a slower post-merger integration process must be considered in close connection with the different M&A motives (Tentative hypotheses #1 and #2) and the corresponding integration strategies in order to realize these motives (Tentative hypotheses #4, #5, and #6). In case of the short-term orientated motives (Tentative hypothesis #1) which required an absorption integration strategy, a quick organizational integration strategy makes sense and perfectly agrees with the findings in the PricewaterhouseCoopers' (2000) study.

However, as far as the realization of the long-term orientated motives (Tentative hypothesis #2) is concerned, a preservation integration strategy was applied. In this specific context, a slow organizational integration is much more appropriate, because it is the aim of this integration strategy to keep up the peculiarities of the acquired biotechnology companies such as the innovative and entrepreneurial spirit as long as possible. Thus, the decision about the right 'degree of speed' depends on the corresponding integration strategy (Tentative hypothesis #26), which however is not accounted for in the study of PricewaterhouseCoopers (2000).

With this concluding remark on the above discussion of the 'speed topic' it is now warranted to toe together the findings of this chapter. So far, the chapter has confronted the case findings with extant post-merger integration theories and has discussed various streams of research in hope of discovering new insights. However, it has been shown that extant post-acquisition integration theory cannot explain most of the crucial observations made in the case studies. In this context, two particular topics were always referred to. One topic is the value chain configuration which serves as a starting point for each integration of biotechnology companies into the structure of pharmaceutical companies. However, non of the existing post-acquisition integration theories takes this important aspect into account. The second major issue is the importance of competencies or capabilities, especially as far as innovation is concerned. Again, none of the existing theories includes this subject. Moreover, that was also one of the main reasons to consider the concept of Teece (2000). Thus, the following chapter aims – by relying on the contributions of two further concepts, core competencies as well as value chain configuration – at generating a new conceptual framework in order to close the gap in the existing literature.

5 Constructing a new approach and directions for further research

> *"Successful acquirers usually base the actual level of integration on the type of capability being acquired: the greater the innovation, the less the integration." (Chaudhuri & Tabrizi, 1999, p. 130)*

After having analyzed and discussed the contributions and explanations extant post-merger and post-acquisition integration can deliver and having come to the conclusion that each of them can only explain a small part of the observations made in the cases between biotechnology and pharmaceutical companies, it is now time for reconciling the shortcomings of the extant integration literature by constructing a new approach. In the terminology used by case study methodologists, Chapter 4 has been engaged in the enfolding of conflicting and supportive literature up to the point where further discussions of extant literature do not produce additional support for the explanation of the case-based tentative hypotheses. Thus, theoretical saturation in the sense of Eisenhardt (1989) and Yin (1984) has been reached. What remains to be done is to utilize what has been learned for constructing a new integration approach, capable of explaining the post-acquisition integration of small biotechnology or, more generally speaking, high-technology companies into the structure of pharmaceutical companies or, in other words, large corporations. This is the ultimate goal of this study. The following sections present and discuss this new approach.

Section 5.1 constructs the new approach by tying together the additional contributions of core competencies and value chain configuration with the conclusions drawn in Chapter 4. Due to the breadth of the core competence literature this study needs to focus on the most relevant literature. Section 5.2 takes the theoretical arguments back to the level of the case findings, i.e., to the set of the tentative hypotheses, in an iterative loop. This step serves to ascertain the validity of this study and to detect any potential remaining weakness of the new approach. Finally, section 5.3 points out some implications of the new concept and presents some potential directions for further research.

5.1 Constructing a new approach

This section is devoted to the ultimate goal of this study, the construction of a new framework, that explains the post-acquisition integration of biotechnology companies in the structure of big pharmaceutical companies. Before the new model will be depicted, two other important theoretical concepts need to be introduced: core competencies and value chain. These two concepts provide some interesting points necessary to consider when constructing the new framework for the post-acquisition integration.

5.1.1 Implications of core competencies and value chain

So far, the different analyses and conclusions drawn have often come to a point at which two major cornerstones determining the post-acquisition of biotechnology in pharmaceutical companies could be identified. The first determinant are the core competencies of the biotechnology companies which need to be defined with respect to the core competencies of the pharmaceutical companies. In order to make this decision it is necessary to use the value chain configuration, the second determinant, as a useful method of classification. Thus, it perfectly makes sense to briefly introduce these two concepts.

The concept of core competencies

The concept of core competencies is part of a larger stream of strategy which is referred to as ‘resource-based view’ of strategy. This approach is grounded in economics (Schumpeter, 1934; Chamberlin 1935; Selznick, 1957; Penrose, 1959), and explains how a company’s resources drive its performance in a dynamic competitive environment. The terminology within the resource-based view of strategy is not clear and straightforward, because different authors use different expressions, with which they refer to a company’s resources. Some use the term ‘core competencies’ (Prahalad & Hamel, 1990; Collis, 1991), others speak of ‘core capabilities’ (Schoemaker, 1992; Leonard-Barton, 1992) or ‘invisible assets’ (Itami & Roehl, 1987) whereas others simply use the expression ‘capabilities’ (Stalk, Evans & Shulman, 1992) or ‘resources’ (Peteraf, 1993). Moreover, Hitt & Ireland (1985) speak of ‘corporate distinctive competencies’ whereas Amit & Schoemaker (1993) use the generic term ‘strategic asset’ in

order to subsume to ‘resources’ and ‘capabilities’. Teece, Pisano & Shuen (1997) even speak of ‘dynamic capabilities’. Zu Knyphausen-Aufseß (1995) speaks of ‘organizational capabilities’. This very brief review of the literature clearly reveals that different expressions exist, which however want to express the same fact that valuable resources can take a variety of forms and are important for the competitive position of a company. On the one hand, these resources can be physical, but on the other hand they may also be intangible such as technological know-how (Hall, 1992; Hofer & Schendel, 1978). Furthermore, organizational capabilities can be embedded in a company’s routines, processes, and culture. The umbrella term academics use to describe this work is the resource-based view of firm/strategy (Collis & Montgomery, 1995). In this context, the company is conceived as a hierarchy or portfolio of core competencies, core products, or core capabilities versus a portfolio of distinct businesses.

This study does not want to further elaborate on the different concepts of the resource-based view of strategy,[67] because it only needs to focus on the underlying argumentation inherent to the resource-based view. Therefore, it is absolutely necessary to have a look at the overall logic and argumentation of this concept, because this logic in combination with the value chain explains the applied integration strategies of the pharmaceutical companies.

From a resource-based point of view, a sustainable competitive advantage results from the possession of relevant capability differentials, which are often intangible assets such as specific skills or reputation. These resources are seen as relatively immobile, and as strengths to be nurtured and should also guide the choice of strategy. However, resources or competencies must be valuable in order to create a competitive advantage. Some authors (Barney, 1986 & 1991; Hall, 1992; Peteraf, 1993; Ghemawat, 1986; Grant, 1991) have tried to specify the conditions under which resources are valuable. Valuable resources are those that are superior in use, hard to imitate, difficult to substitute for, and more valuable within the firm than outside. Thus, resources or competencies are only

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[67] A good description about the evolution of the resource-based view can be found in Mahoney & Pandian (1992), who discuss the role of the resource-based view within the conversation of strategic management. Another very good overview can be found in zu Knyphausen-Aufseß (1993 & 1995).

meaningful in the context of performing certain activities in order to achieve certain competitive advantages. Linking this to the context of this study, the question comes up, what are the unique resources, capabilities or core competencies[68] of the biotechnology company. However, it is not enough to analyze the biotechnology company on its own with regard to its potential core competencies.

Due to the fact that the biotechnology company has been acquired by the pharmaceutical company it is instead necessary to analyze the performing of the biotechnology company's activities in relation to the pharmaceutical company. This context is generally provided by the value chain concept, and in this study more precisely by the value chain of the pharmaceutical company/industry. Hence, the determination of the core competencies of the biotechnology company needs to be done with respect to the pharmaceutical value chain. Having in mind, that core competencies are those that are superior in use, hard to imitate, difficult to substitute for, and more valuable within the firm than outside, the definition of the biotechnology company's core competencies will have an immediate impact on the choice of the post-acquisition integration strategy. Before combining these two perspectives there will be a brief discussion of the value chain concept.

The value chain concept of Porter

Porter (1985) has developed the value chain concept, a systematic way for analyzing the sources of competitive advantage by examining all the activities a firm performs and how they interact. The value chain disaggregates a firm into its strategically relevant activities in order to understand the behavior of costs and the existing and potential sources of differentiation. A company is considered as gaining competitive advantage by performing these strategically important activities more cheaply or better than its competitors.

The value chains of firms in an industry differ, reflecting their histories, strategies, and success at implementation. Nevertheless, Porter (1985) has

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[68] In the following, the term 'core competencies' will be used synonymously to 'resource' and 'capabilities', because it is the best expression for the purpose of this study.

identified nine generic categories of activities, shown in Figure 39, which are linked together in characteristic ways every firm's value chain is composed of.

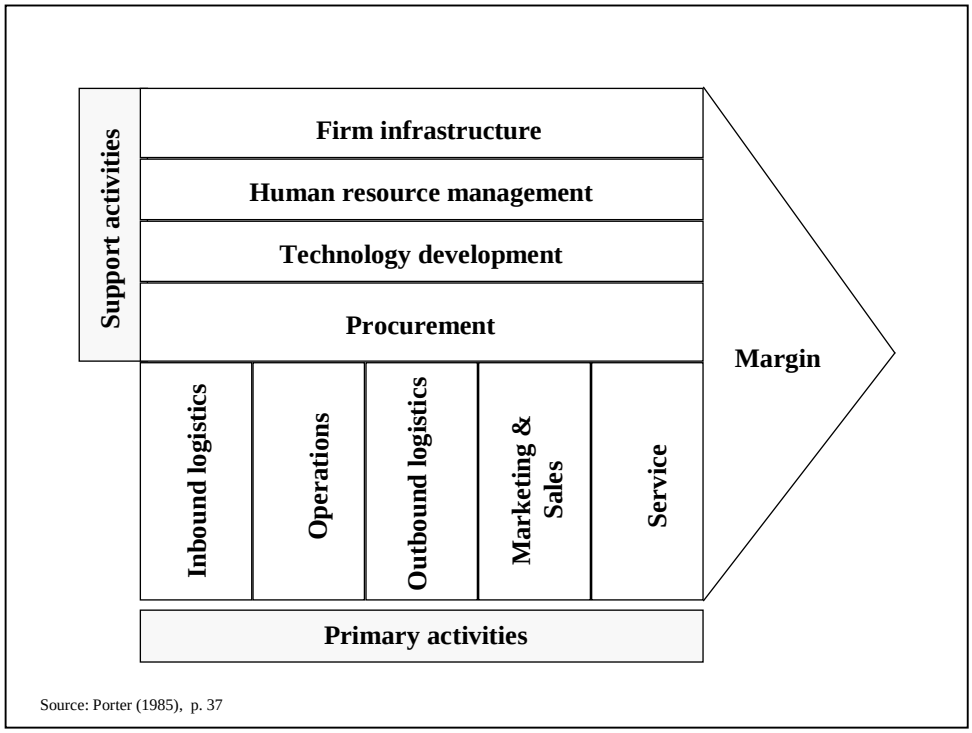

Figure 39: The generic value chain

The value chain displays total value and consists of different value activities and a margin. Value activities are the physically and technologically distinct activities a firm performs and are considered as the building blocks by which a firm creates a product valuable to its buyers. The margin is the difference between total value and the collective cost of performing the value activities. These value activities are divided into two broad types, primary activities and support activities.

Primary activities, listed along the bottom of Figure 39, are those activities that are involved in the physical creation of the product, its sale and transfer to the buyer as well as after-sale assistance. There are five generic categories of primary activities (inbound logistics, operations, outbound logistics, marketing and sales, service) involved in competing in any industry, which are also divisible in a number of distinct activities depending on the particular industry and firm strategy.

Support activities support the primary activities and each other by providing purchased inputs, technology, human resource, and various firmwide functions.

Support value activities can be divided into four generic categories (procurement, technology development, human resource infrastructure, firm infrastructure), which are also divisible into a number of distinct value activities. How each value activity is performed will determine its contribution to buyer needs and thus differentiation.

Combining the logic of the value chain with the perspective of the resource-based view, one important guiding question for the post-acquisition integration of biotechnology companies in the structure of big pharmaceutical companies is: Are the core competencies of the biotechnology or of the pharmaceutical company the basic source of differentiation and ultimate value creation? This question will be used when constructing the new post-acquisition integration framework in the next section, because both aspects are not considered in the extant post-acquisition integration literature.

5.1.2 Constructing a new approach: Framework for the post-acquisition integration of small high-technology companies in the structure of large corporations

Having in mind the limitations of the existing theory and having accepting the argumentation of the previous section a new framework can be developed. This framework (cf. Figure 40) tries to analyze the position and responsibilities of the acquired biotechnology company according to their position within the integration box. At this point it is very important to point out that the final concluding hypothesis of this explanatory study will be – as the value chain differs from industry to industry – that this framework, more precisely the different value activity steps, needs to be tailored to each specific industry.

However, in the context and for the purpose of this study, the framework will be developed and presented with the specific industry constellation of this study. This means that the framework will be developed at the *example* of the post-acquisition integration of biotechnology companies into the organizational structure of big pharmaceutical companies. This study claims that this new framework is better understood when explained at the concrete example of the analyzed cases. Moreover, as the value chain logic can be considered as some kind of common/basic knowledge among academics as well as practitioners, it is

assumed that the application of this concept to an other industry or company can easily be transformed. Thus, the construction of the new framework/model is intentionally illustrated at the case examples discussed in this study. In addition to that, it was the ultimate goal and the explicitly stated intention of this study to develop a framework/model for the explanation and future handling of the post-acquisition integration activities of pharmaceutical companies when facing the challenge of integrating biotechnology companies.

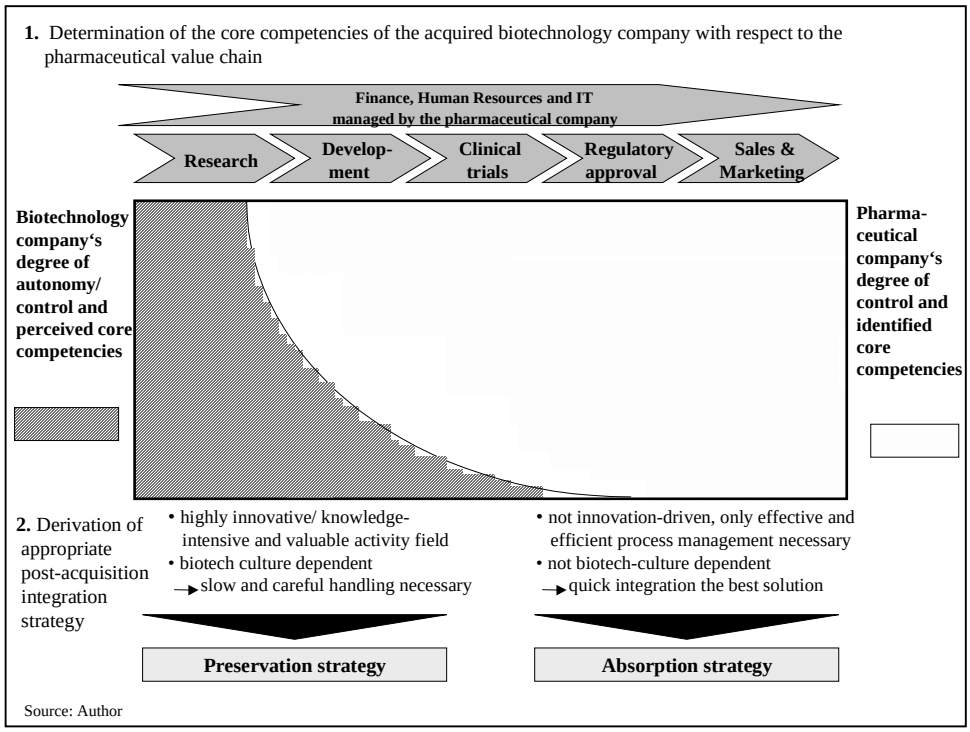

Figure 40: Post-acquisition integration framework

On the left side of the integration box in Figure 40, there is the autonomy and the control from the biotechnology point-of-view, whereas on the right side the control and responsibility of the big pharmaceutical company is determined. Hence, it is possible to split up this box in two different pieces whose size determines the degree of control/autonomy each party has. The bigger the size of one area the more control the respective party has. The crucial part of this concept is the determination of the 'border' between these two areas. The determination depends on the perceived core competencies the acquired biotechnology company has with regard to the pharmaceutical value chain placed over the box as a reference point. This implies that the acquiring pharmaceutical company must compare its core competencies with the ones of the biotechnology

on each step or, in the words of Porter (1985), primary value activities of the pharmaceutical value chain.

This framework can fulfill two different purposes. In a first step, it can be used for ex-post analytical reasons in order to determine the integration strategy of a knowledge-intensive high-tech start-up that is to be integrated in a large corporation. In this context, this frameworks helps to analyze, classify and compare the success of the different integration approaches. In this sense, it is a framework for the classification of empirical phenomena. In a second step, which is even more important, this framework can serve as a model in order to determine the appropriate post-acquisition integration strategy. These are the two different application alternatives, which will be discussed in the following paragraphs.

With the help of this box it is possible to determine the different positions of the acquired biotech company depending on the different projects it currently manages. In the early stages of the pharmaceutical value chain, i.e. research and development, biotechnology companies are usually granted more autonomy, whereas in the more advanced steps of the value chain, the control is taken over by the big pharmaceutical companies. The reason for this is the simple fact, that the core competencies of the biotechnology companies are placed in the area of research and development. That is also one of the main reasons why they have been acquired by the pharmaceutical companies. Hence, the early-stage projects remain under the control of the biotechnology company, whereas the late-stage ones are slowly or even abruptly taken away from the biotechnology company and put under the control of the pharmaceutical company. Doing this for all projects, the shifting point in terms of control/autonomy can be found out. As far as the supporting functions, or in the words of Porter (1985), supportive value activities like financing, human resource, controlling or IT are concerned, they are completely carried out by the bigger and acquiring pharmaceutical company. In these fields, pharmaceutical companies usually have elaborated systems and structures in place. Compared with the smaller companies they can also be considered as core competencies. Consequently, they are managed by the larger corporation and no knowledge or competence transfer takes place. So far, this paragraph has described the first possibility of using this framework, as an ex-post analytical tool. The next paragraph will go one step further, because the

determination of the position in the box is used as the basis for recommending a specific post-acquisition integration strategy.

The determination of the position of the different projects in the integration framework has immediate consequences for the post-acquisition integration strategy. In the area in which the core competencies of the biotechnology company are considered as being better than those of the pharmaceutical company, a preservation integration strategy needs to be applied, because core competencies are those that are superior in use, hard to imitate, difficult to substitute for, and more valuable within the firm than outside. Thus, these core competencies can only flourish in the context of the biotechnology company, but not in the organizational structure of a big pharmaceutical company. The biotechnology companies are the ‘stars’ in the field of biotechnology research, which makes this area their core competencies. This fact also explains why there is no knowledge transfer between both organizations. There are some further implications to consider. The most crucial core competencies of the biotechnology companies are their entrepreneurial spirit, their risk-taking attitude, their flat organizational hierarchy as well as their innovative capabilities based on their specific biotechnology know-how. These are the central characteristics, which are particular to an independent and small biotechnology company. Remembering the argumentation of Teece (2000), who described the determinants of the rate and direction of firm level innovation, these characteristics need to be preserved in order to keep up the major core competencies of the biotechnology companies. Preserving the innovative capability of the biotechnology company has been one of the dominant motives for the acquisition. By this, they are to contribute to the long-term growth of the pharmaceutical company. Thus, the overall organizational integration strategy must be to grant the acquired biotechnology company as much autonomy and independence as possible. Because of this, a slow integration process is the right alternative to chose.

Apart from that, the pharmaceutical value chain contains also some steps that do clearly belong to the core competencies of a large pharmaceutical company. As far as clinical trials, especially late-stage clinical trials, regulatory affairs or even sales and marketing are concerned, these areas are the natural core competencies of large pharmaceutical companies. They know how to handle large-scale and

worldwide operating clinical trials. Moreover, they also have the money to finance it, whereas a biotechnology company usually cannot afford this. In fact, this lack of experience as well as the missing financial resources are the major reasons why the biotechnology companies have accepted the takeover bid of the pharmaceutical companies. Thus, advanced clinical trials or marketing and sales of a newly approved biotechnology product are nothing what is to be carried out by the biotechnology companies. They have neither the necessary experience nor the structure for the worldwide distribution of a product. These are the natural core competencies of a big worldwide operating pharmaceutical corporation. Therefore, the right organizational integration strategy for these areas is an absorption approach in which the pharmaceutical company takes over the complete control. As the pharmaceutical company is supposed to apply an absorption approach, a quick integration process is useful.

So far, this analysis has shown that pharmaceutical companies have a difficult balance to strike by applying a slow preservation strategy, on the one hand, while at the same time setting a quick absorption approach in place, on the other hand. This necessary procedure of a hybrid strategy bears of course some further repercussions, because these two strategies cannot really be separated as they need to be applied in a very small organization at the same time. This implies e.g. that – after the acquisition – the entrepreneurial spirit gets lost and the acquired biotech company turns more into a center of excellence for a specific technology with a high degree of autonomy.

Thus, this framework must be complemented by a dynamic perspective and can only be considered as some kind of starting point due to the fact that the nature of the biotechnology begins to alter after the acquisition. After the acquisition the biotechnology company turns more and more into a center of excellence. The explanation for this is also quite obvious. The entrepreneurial spirit is no longer needed, because sales and marketing are taken over by the pharmaceutical company, which was formerly the goal of the independent management of the biotechnology company. However, these people left the company in the meantime due to that reason. After the acquisition, the former independent biotechnology company is now only focusing on doing basic research. Thus, the entrepreneurial spirit has been replaced by a spirit of discovery. This is also considered to be one of their core competencies and reveals why they are granted

that much autonomy in this field. In addition to that, this makes obvious why there is no knowledge transfer. The knowledge about this specific technology is the competence of the biotechnology company and not the competence of any part in the big pharmaceutical company. If they had possessed that knowledge, they would not have had to acquire the biotechnology company. Taken this all together, the end point within the integration box will rather be determined by a vertical and not by a curve. This vertical clearly separates the field of core competencies of the biotechnology company from that of the pharmaceutical company.

As far as the rather ‘simple’ and straightforward organization of the post-acquisition integration process is concerned a phase-process like that presented by Roland Berger Strategy Consultants (1999) is a useful planning tool. The discussion in this section has shown that the newly developed framework is a useful concept for analyzing and supporting the post-acquisition integration strategies of pharmaceutical companies when facing the need to integrate smaller biotechnology companies. Additionally, this study claims that this developed framework can also be generalized to other high-tech industries in which a highly-dynamic, knowledge-intensive and entrepreneurial driven start-up is acquired by and needs subsequently to be integrated into the structure of a larger corporation. In this case, the value chain must each time be adopted according to the requirements of the specific industry.

5.2 Revisiting the tentative hypotheses

As already indicated in the introductory comments to this final chapter, the proposition of the 'framework for post-acquisition integration of small high-technology companies' into the structure of large corporations is to be followed by confronting this new approach with the set of tentative hypotheses formed in Chapter 3.6, the final section of the case study chapter. This confrontation is the aim of the following section. Following the juxtaposition of extant post-acquisition and post-merger integration theory with the case findings in Chapter 4, this confrontation is the second step of this kind of theory evaluation.

Although the set of tentative hypotheses is already incorporated in the proposed 'framework for post-acquisition integration of small high-technology companies' into the structure of large corporations, there is still a need to revisit them. This incorporation took place in two different ways. First, specific components of extant organizational integration literature were integrated into this study's approach, because they demonstrated explanatory power for some of the tentative hypotheses. Hence, the tentative hypotheses have exerted considerable influence on the new concept. Second, and even much more important, the confrontation of extant post-acquisition and post-merger integration literature with the set of tentative hypotheses found many shortcomings of extant models, because very often only some small parts of these models could be used as an explanation for the observations made in the case studies. This was also the reason for the search for new inputs from previously largely unrelated concepts such as 'core competencies' and 'value chain configuration'.

Combining these inputs with some parts of the extant post-merger integration models resulted in the construction of the new framework. In this sense, the tentative hypotheses guided the entire search and development process for the new concept. Although, as just demonstrated, the tentative hypotheses have already been an integral part of the development phase of the new concept, they need to be revisited, primarily because of methodological reasons. For any type of empirical work – irrespective of whether it may be qualitative case study work or quantitative surveys – the establishment of internal validity is a very crucial factor. This has also been mentioned in the discussion of the research

methodology in Chapter 2. In the context of this study, the question of internal validity can be paraphrased in the following way: Is the ‘framework for post-acquisition integration of small high-technology companies’ into the structure of large corporations really able to explain what has been observed in the case studies?

This section tries to answer that question and, by this, is concerned with increasing internal validity. This is done by using iterative loops, in which the results of a study’s analytical generalizations are repeatedly checked against the observed phenomena. For this study this means that the ‘framework for post-acquisition integration of small high-technology companies’ into the structure of large corporations is checked against the set of tentative hypotheses. This confrontation allows to identify and, thus, supports what the novel approach does explain and, equally important, where the model remains unclear or where it does not hold the explanatory power.

However, it is necessary to emphasize that the support for internal validity is a little bit restricted as the developed framework has been illustrated at the example of integration activities between biotechnology and pharmaceutical companies. This has been done, because the analysis of the post-acquisition integration activities between small biotechnology companies, on the one hand, and large pharmaceutical companies, on the other hand, represents the overall analytical focus and aim of this study. Hence, the development of the framework took place while having the specific constellations between these two kinds of companies in mind. Nevertheless, the short confrontation needs to be done because of methodological rigor.

Chapter 3.6 presented a set of 28 tentative hypotheses. For an easier confrontation with the ‘framework for post-acquisition integration of small high-technology companies’ into the structure of large corporations the tentative hypotheses are revisited in the same order. The following Table 5 provides a classified overview of the tentative hypotheses.

	Number	Tentative hypothesis
M&A motives	# 1	Filling up R&D pipeline, access to new products (short-term)
	# 2	Access to knowledge/U.S. market, support growth (long-term)
	# 3	Financial support and support in regulatory affairs
Organizational integration	# 4	Overall integration strategy is to grant the acquired biotechnology company as much autonomy as possible vs. control in certain areas
	# 5	Integration strategy depends on the progress of the specific project
	# 6	Control decision determined according to the core competencies
	# 7	The more competencies in the biotech company the more autonomy
	# 8	Organizational collaboration functions primarily on a project base
	# 9	Supportive activities taken over/controlled by pharma companies
	# 10	Responsibility for and reporting to a pharmaceutical board member
	# 11	No systematic knowledge/technology/competence transfer
	# 12	Biotech companies turn into centers of excellence
	# 13	Value of biotech know-how only to protect in its original context
	# 14	Big cultural gap between pharma and biotech, which explains the chosen integration strategies
	# 15	Entrepreneurial/risk-taking spirit of biotech companies gets lost
	# 16	Development from an entrepreneurial-driven firm into a more research-orientated center of excellence of a big company
	# 17	Significant increase in employee turnover, especially top managers
	# 18	Special incentives in order to make some of the top executives stay
	# 19	Missing of a stock option program creates problems
	# 20	Introduction of special incentives and bonus plans
	# 21	Some people (especially researchers) appreciated aspects of the takeover (job security, access to vast resources)
Organization of the integration process	# 22	Integration is approved and supported by the top management of the acquiring pharmaceutical company
	# 23	Process carried out by integration teams/managers in a spirit of a 'merger of equals'
	# 24	Support by external consultants if necessary
	# 25	Communication on two levels (general speeches, face-to-face)
	# 26	Speed depends on the integration strategy applied
General aspects	# 27	Nature of the biotechnology company changes as it becomes a center of excellence within a big pharmaceutical company
	# 28	Acquisition of a biotechnology company is considered as an investment that pays off or not

Table 5: Classified summary of the tentative hypotheses

The acquisition motives needs to be spilt up in two perspectives, one is the perception of the pharmaceutical companies and their underlying rationale for acquiring the biotechnology companies (Tentative hypotheses #1 and #2), and the other are the reasons of the biotechnology companies in order to let themselves be taken over (Tentative hypothesis #3). Although these motives are not explicitly stated in the framework for *post-acquisition* integration, they represent the underlying rationale for this model. The intended motives in combination with the core competence situation at the biotechnology companies determine the organizational integration strategy. In order to realize the short-term orientated motive – access to new products or to fill up a lack in the R&D pipeline – a quick absorption integration strategy is useful, whereas the realization of the long-term orientated motives demands for a slow, preservation approach. Thus, both motives are covered by the framework. Moreover, the last motive-oriented tentative hypothesis (#3) also corresponds to the framework as the motives of financial and regulatory support are to be realized shortly whereas the access to the vast resources of a pharmaceutical company is a long-term commitment and ensures the overall growth strategy and future survival of the biotechnology company.

The tentative hypotheses #4, #5, #6, and #7 represent what all this study is about, the development of a framework in order to determine the appropriate post-acquisition integration for an acquired biotechnology company. Tentative hypothesis #4 defines the overall organizational integration strategy. As the preservation of the culture and innovative spirit is part of the post-acquisition integration process, the overall integration strategy must reflect the preservation approach. However, this overall integration approach is limited to the area in which a preservation is intended. This depends also on the underlying motives for the acquisition (Tentative hypotheses #1 and #2). In the field where a control from the pharmaceutical-side is desired the second organizational integration strategy, absorption, is applied (Tentative hypothesis #5). The decision at what steps of the pharmaceutical value chain this second integration strategy will be used is based on the analysis of both companies core competencies with respect to one another (Tentative hypothesis #6). As a logic consequence out of this analysis, tentative hypothesis #7 defines the degree of autonomy and control of

the biotechnology company. By this, a specific point in the integration box can be determined for each acquired biotechnology company.

Tentative hypotheses #8, #9, and #10 cope with the organization of the collaboration process subsequent to the acquisition. The realization of this collaboration process depends on the perceived core competencies and on the overall integration strategy. Tentative hypothesis #8 claims that the interactions between the acquired biotechnology and pharmaceutical companies take place on a project base and not by a complete integration. To a certain extent this is true, as it reflects the overall integration strategy and is especially valid for the area which is dominated by the preservation strategy. However, this statement is not valid as far as the area of the absorption strategy is concerned. In addition to that, the supportive activities like human resources or finance are either directly managed by the pharmaceutical company or at least carried out according to the rules and requirements of the larger, acquiring pharmaceutical company (Tentative hypothesis #9). In the context of the newly developed framework, this aspect is represented by the large arrow above the different steps of the pharmaceutical value chain (cf. Figure 40).

Tentative hypothesis #10 can be considered as a recommendation for a successful realization of the necessary responsibility and reporting structure. It must (or should) be a board member who is in charge of the acquired biotechnology company, due to the fact that the integration of the biotechnology company involves to handle and to support two integration strategies at the same time. The decision about what integration strategy to apply at what specific point cannot be made by middle management. This is a strategically and politically difficult decision, that must be controlled and supported from the very top of the acquiring company. Thus, tentative hypothesis #10 is implicitly accounted for, as it more or less can also be considered as some kind of basic requirement for a successful post-acquisition integration.

The confrontation of tentative hypotheses #11, #12, and #13, that deal with the topic of knowledge transfer with the model's propositions are relatively straightforward as they provide clear support for the choice of the respective integration strategy. Tentative hypothesis #11 emphasizes the fact that no systematic knowledge and competence transfer takes place between the acquired

and acquiring company. The reasoning for this is quite simple and is part of the decision about what integration strategy to use. As far as the preservation approach is concerned, this specific strategy has been chosen in order to preserve the unique knowledge that is embedded in the biotechnology companies. This knowledge can only flourish in the context and culture of the biotechnology company. Thus, it will not be transferred, because it would get lost in this case. As far as the absorption strategy, focusing on the later steps of the pharmaceutical value chain, is concerned, the knowledge and experience lay in the pharmaceutical company and definitely not in the acquired biotechnology company. Again, there is no need for a knowledge or competence transfer. The same rationale is valid for the supportive activities like finance or budgeting.

Tentative hypothesis #12 is a logic consequence that arises out of tentative hypothesis #11 and the chosen preservation strategy as it refers to the organizational character of the biotechnology company after the acquisition and subsequent integration, aiming at preserving the specific knowledge of the acquired firm. As time goes by, the biotechnology company turns into a center of excellence of the larger pharmaceutical company. Tentative hypothesis #13 further elaborates on and supports this issue as it points out that the value of the biotechnology knowledge can only be preserved in its specific context, the local network of the – formerly independent – biotechnology company.

Three tentative hypotheses (#14, #15, and #16) relate to cultural topics. To start with, tentative hypothesis #14 is compatible with the models overall recommended integration strategy to grant the acquired biotechnology company as much autonomy and independence as possible in order to keep up their innovative spirit as long as possible. Thus, because of the two incompatible cultures that is the best strategy to chose. Tentative hypothesis #15 puts the ultimate success of this strategy in another light. Despite the fact that this autonomy approach is chosen, tentative hypothesis #15 states that the culture of the biotechnology companies changes and gradually comes closer to the culture of the pharmaceutical company. This fact can hardly be reproduced in Figure 40, but it is implicitly included in the recommendation that can be derived from the framework. This point must be considered in close connection with the issue of knowledge and competence transfer discussed in the previous paragraph. In order to keep up the value of the knowledge as well as the innovative spirit of the

acquired biotechnology company, the only viable solution is to keep them independent and make them develop into a center of excellence. This suggestion is supported by tentative hypothesis #16 and it also perfectly matches with the proposed preservation strategy for the innovative and knowledge-intensive part of the acquired biotechnology company.

The accordance between the tentative hypotheses concerning the human resources related issues (Tentative hypotheses #17, #18, #19, #20, and #21) and the framework is not as apparent as it is between the hypotheses discussed so far and the framework. Indeed, some of these hypotheses have more in common with the model than others, which merely are not explained by the framework. Tentative hypothesis #17, which claims that there is a significant turnover after the acquisition especially from top managers, is more or less an immediate consequence that arises out of the biotechnology's company acquisition and its subsequent integration into the structure of a large pharmaceutical company. These people leave, because they can no longer fulfill their entrepreneurial aspirations as the nature of the formerly independent biotechnology company changes. The company is now more or less an integral part of a larger corporation with its own culture and different organizational rules. However, the reaction of the leaving top managers can be explained with the framework.

Tentative hypothesis #18 is not directly linked to the framework. It is first and foremost part of the underlying organization of the post-acquisition integration process, as it tries to identify some trustworthy individuals to build the organizational integration upon. Only in a second step, the goal of keeping some of the top executives has also something to do with the aim of preserving the specific culture of the biotechnology company, because the culture is to some extent also rooted in its top managers.

As far as tentative hypothesis #19 is concerned, the same logic applies as in the discussion of the previous tentative hypothesis. At a first glance, stock options are an incentive means in order to attract, motivate and retain people. The future missing of a stock option program is simply a fact as the larger, acquiring corporations do not grant stock options to all employees, in contrast to small start-ups which often do that. Granting stock options is considered as being an integral part of the culture at U.S. biotechnology companies. This implies that

with the lack of the stock option program a part of the specific biotechnology culture ultimately disappears, which in turn makes it difficult or, in fact, even impossible to keep up the entrepreneurial and risk-taking culture and spirit, an independent biotechnology company may have, but not a center of excellence of a big pharmaceutical company.

Tentative hypothesis #20 describes the acquiring company's reaction on that issue. In order to make up for the missing stock option programs alternatives such as special incentives or bonus programs are introduced. This problem must be handled in the integration process. The final tentative hypothesis (#21) dealing with the acceptance of the takeover cannot really be explained by the newly developed framework, but it has also no impact on the validity of the framework.

Considering the tentative hypotheses #22, #23, #24, #25, and #26, it needs to be admitted that their primary function is to depict the organization of the post-acquisition integration process. Broadly speaking, the basic tools, like project management, steering committees or integration managers, which were used in the organization of the integration of a small biotechnology company into the structure of a large pharmaceutical company do not really differ from the tools in use when realizing the merger of two large corporations. Nevertheless, some of the specific arrangements in the post-acquisition process between small biotechnology and large pharmaceutical companies do reflect and influence some of the specific characteristics of the newly developed framework.

Tentative hypothesis #22 deals with the fact that the integration process should have the full approval and support of a pharmaceutical's company board member, because the realization of the two integration strategies – preservation as well as absorption – needs to be directed and initiated from the very top of the company. Such a decision is not made at the level of middle management. Thus, the fact that two distinct integration strategies need to be realized at the same time, also referred to as hybrid approach, requires the approval and support from the board members.

Tentative hypothesis #23 deals with the subject that the integration process needs to be carried out in the spirit of a 'merger of equals'. This corresponds with the overall integration strategy that the acquired biotechnology company is to

preserve the maximum of possible autonomy and independence. If that is the intention and ultimate goal of the integration process, it will be impossible and un-logic to let the integration teams be dominated by the acquiring pharmaceutical company. Instead, the integration process must be sustained by the spirit of a ‘merger of equals’, so that a preservation approach can be realized successfully.

As far as tentative hypothesis #24 with the possible involvement of external consultants is concerned, that is rather some kind of recommendation or possibility which is not directly linked to the framework. In case any major problems occur during the integration process that cannot be solved without external support, one might think about involving consultants. The same conclusion applies for tentative hypothesis #25 dealing with the issue of communication. This is rather considered as an important enabler or supporting function for the easy realization of the post-acquisition integration process and, by this, is also not directly related to the framework.

Tentative hypothesis #26 copes with the topic of speed. In contrast to the two previous aspects, this issue is directly associated with the framework, because speed needs to be tailored according to the respective integration strategy. In case of the preservation strategy that aims at realizing the long-term motives and at preserving the independence and autonomy of the biotechnology company a slow approach seems to be reasonable. However, considering the absorption strategy which primarily relies on the existing core competencies of the acquiring pharmaceutical companies, a quick realization of the integration is appropriate. Thus, both approaches have their right to exist.

The cross-case analysis has also made two tentative hypotheses (#27 and #28) emerge that rather treat general aspects or findings made in dealing with the different cases. Tentative hypothesis #27 claims that the nature of the biotechnology company changes after the acquisition and subsequent integration into the pharmaceutical company. The previous revisiting of the tentative hypotheses has already shown that this hypothesis is implicitly included in the developed framework. In contrast to this, no real explanation or support for tentative hypothesis #28 is included in the framework. This has also something to do with the altering nature of the acquired biotechnology company and its

perception by the acquiring pharmaceutical company. However, no support or explanation for this issue can be found in the developed framework. As this is only an additional, interesting aspect, it does not really matter whether this last phenomenon can be explained by the framework or not.

The preceding confrontation of the ‘framework for post-acquisition integration of small high-technology companies’ into the structure of large corporations with the set of tentative hypotheses has found overwhelming support of the explanations the new framework offers. This is indeed not very surprising as already mentioned at the beginning of this section. Most of the tentative hypotheses that were derived immediately from observations and analyses of real-life post-acquisition integration cases can be thoroughly explained by the new model.

However, some questions remain concerning the applicability of this framework across all types of industries and companies as the value chain activities need to be adapted each time. The focus of this study was clearly put on the relationships and interactions between the acquired biotechnology firms and the acquiring pharmaceutical companies that had to deal with the challenge of successfully mastering the post-acquisition integration. Because of this limited focus, future research for the applicability of this concept in other high-tech industries is required. The overall aim of this section was to check the new ‘framework for post-acquisition integration of small high-technology companies’ into the structure of large corporations against the case-based tentative hypotheses in order to increase the model’s internal validity. The confrontation performed in this final iterative loop led to a substantial corroboration of the new framework as it offers profound explanations of almost all tentative hypotheses. Of course, results of exploratory research are often not as clear-cut as one would like them to be. Hence, the detection of shortcomings and the uncovering of needs for future refinement is one of the reasons why this iteration was performed and why future research is still necessary.

5.3 Implications and directions for further research

This study has explored the post-acquisition integration activities between biotechnology and pharmaceutical companies. Five cases about these integration activities were described in detail in the context of the respective development of the pharmaceutical and biotechnology industry. The rich description has demonstrated how the post-acquisition integration activities were managed. In order to analyze this, within-case and cross-case analyses were performed.

Using the methodological procedure of comparative case-study research this study has led to the identification of several common patterns and topics that are of crucial importance in the context of post-acquisition integration. These observations were assembled to form a set of tentative case-based hypotheses, which also served as the point of departure for the indepth discussion of the theoretical perspectives of post-merger and post-acquisition issues. The most important parts of the large body of extant post-merger and post-acquisition integration literature was confronted with the case findings. Although some of the propositions from the investigated models offered small, partial explanations of what has been observed in the cases, the existing models revealed serious shortcomings. Because of this, the study resulted in the construction of a ‘framework for the post-acquisition integration of small high-technology companies’ into the structure of large corporations.

This new approach ties together the case-study findings, which revealed a clear demand for the consideration of core competencies in combination with the value chain concept, and the implications of the existing literature about post-merger integration. The model’s explanations were cross-checked with the tentative hypotheses and were found to be in accordance with the case findings. Thus, from the perspective of theory development this research has contributed considerably to an extension and, hence, improvement of the existing post-acquisition integration theory. The framework can be used in two different ways. On the one hand, it can be used as a method for the ex-post analysis and classification of post-acquisition integration activities. But on the other hand, its main objective is to serve as a tool for choosing the right post-acquisition integration strategy in order to implement the chosen strategy successfully.

Hence, apart from the theoretical contribution, the newly developed framework for post-acquisition integration of small high-technology companies' into the structure of large corporations is also a tool for practitioners of management. Therefore, it is of course also necessary to highlight the managerial applicability of this model. This study makes an explicit effort of emphasizing several findings that may serve as valuable inputs for managerial decisions and can be considered as points of departure for developing solutions to specific business problems. The recommendations are derived from the observation and analysis of the behavior of the case companies, on the one hand, and a profound discussion of various streams of literature, one the other hand. The combination of the two perspectives resulted in the construction of a new approach.

Perhaps, the most apparent implication to be drawn from the framework is the clearly documented fact, that post-acquisition integration strategy does not equal post-acquisition integration strategy. Indeed, there are severe differences in the various concepts, what has also made Haspeslagh & Jemison (1991) develop their classification of different post-acquisition integration activities. In the context of the acquisition of a highly-dynamic, innovation-driven and knowledge-intensive company, it is very difficult to find the right organizational integration strategy, because the acquiring company needs to apply two different integration strategies at the same time.

In the knowledge and innovation driven part, the acquired company needs to be granted a high degree of autonomy, whereas in the later steps of the underlying value chain, the control and responsibility is taken over by the acquiring company. As a consequence of this hybrid approach, managers of the acquiring company must somehow be 'double-minded', because they need to apply both strategies at the same time. It is a difficult balance to strike, if an individual needs to grant the maximum autonomy to one part of the company, whereas another part needs to be completely integrated and receives merely no autonomy at all. That is a very complex situation, which also needs to be clearly communicated within the acquiring company. Most of the people are normally not aware of the fact that they need to treat the acquired company in two different ways. In fact, that is probably the toughest thing to manage, getting the employees of the acquiring company to accept this ambivalent situation and to adopt their behavior

respectively. Being able to apply such a strategy creates the opportunity to fulfill the motives connected with the acquisition and to create value.

This study has been exploratory in nature and therefore definitely does not claim to offer ultimate truths. Indeed, some problem remain unresolved. The proposed model does not hold the 'exclusive rights' to explain of how to realize the post-acquisition integration of biotechnology companies into the structure of large pharmaceutical companies. Because of the shortcomings of the extant literature in this field and through repeated confrontation of the new model and the traditional models with the case findings, it has however become obvious that the newly developed framework offers the most appropriate explanations for the behavior observed in the cases. Nevertheless, there are some things that are not adequately addressed. Apart from that, the newly developed model does not try to 'reinvent' the recommendations existing integration theory offers in order e.g. to deal with human resource problems or how to get the different IT systems of both companies effectively put together. As far as this specific tasks are concerned, this study claims that one can easily rely on the already existing concepts that were discussed in Chapter 4 although most of them have been found inappropriate of explaining most of what has been observed in the cases. Nevertheless, these concepts can deal with one specific issue like e.g. human resources, but have no explanatory power for the rest. That was the main reason why these concepts had been judged inappropriate, not because these concepts are not good by itself, but due to the fact that they were unable to establish the link and the overall picture between these different concepts. In fact, no existing model was able to do that. This resulted in the construction of a new approach that tries to establish a link between the single tasks necessary for post-acquisition integration. The overall goal of the framework for the post-acquisition integration of small biotechnology companies into the structure of large pharmaceutical corporations is to put these single tasks together under one strategic roof.

In the process of research some light has been shed on previously unexplained issues. The 'framework for post-acquisition integration of small high-technology companies' into the structure of large pharmaceutical corporations has demonstrated its contribution to the theory of post-merger and post-acquisition integration activities by extending its explanatory power to the integration of

small, high-tech start-ups into large firms. The theoretical model has thus advanced the theoretical understanding in this context. However, there is still a clear need for future research. An issue that deserves special attention in future research is the applicability of this concept in other high-technology industries. Apart from that, the topic of performance connected with a specific integration strategy needs to be addressed. Obviously, there are still a lot of interesting questions unanswered, this study could not answer or even just has opened.

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Summary in German[1]

Die vorliegende Arbeit trägt den Titel „Post-acquisition integration of small biotechnology firms in the structure of large pharmaceutical companies“ und beschäftigt sich mit den Problemen und Fragen, die sich im Kontext der Post-Merger Integration von kleinen Biotechnologie-Unternehmen in die Struktur von großen Pharma-Unternehmen ergeben. Ausgangspunkt der Überlegungen ist dabei einerseits die Erkenntnis, dass eine Vielzahl von M&A-Transaktionen insbesondere aufgrund einer schlechten Post-Merger Integration scheitern, und andererseits die Tatsache, dass trotz dieser Einsicht und der hohen Bedeutung, die der Post-Merger Integration zugeschrieben wird, dieses Phänomen wissenschaftlich noch nicht ausreichend erfasst ist.

Der zentrale Untersuchungsgegenstand dieser Arbeit ist die Organisation der Post-Akquisitions Integrationsaktivitäten zwischen Biotechnologie- und Pharma-Unternehmen. Diese Perspektive wurde gewählt, da es (1) eine ständig zunehmende Anzahl von Akquisitionen zwischen beiden Unternehmenskategorien zu beobachten gibt und (2) das Post-Akquisitions Integrationsmanagement aufgrund der erheblichen Größenunterschiede zwischen Biotechnologie- und Pharma-Unternehmen vor besonders großen Herausforderungen steht. Eine systematische Analyse, wie diese Herausforderungen gemeistert werden können, führt zu Einsichten und Handlungsempfehlungen, die auch beim Integrationsmanagement in anderen Branchen fruchtbar genutzt werden sollten. Das zentrale Forschungsanliegen dieser Arbeit ist es daher darzulegen, wie es den Pharma-Unternehmen gelingt, die akquirierten Biotechnologie-Unternehmen in ihre Struktur zu integrieren, um einerseits Zugang zu dem dort vorhandenen Wissen und den Technologien zu erhalten, gleichzeitig aber auch den unternehmerischen Geist sowie die Innovationskraft dieser Biotechnologie-Unternehmen nicht zu gefährden. Die Pharma-Unternehmen sehen sich dabei dem Paradoxon gegenüber, dass sie auf der einen Seite die Biotechnologie-Unternehmen auf irgendeine Art integrieren

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[1] Diese Zusammenfassung in deutscher Sprache dient zur Erfüllung der Anforderung gemäß §6 Abs. 6 der Promotionsordnung für die Fakultät Sozial- und Wirtschaftswissenschaften der Universität Bamberg vom 14. Juli 1982, zuletzt geändert durch die „Siebte Satzung zur Änderung der Promotionsordnung für die Fakultät Sozial- und Wirtschaftswissenschaften der Universität Bamberg vom 2. April 2001“.

müssen, um Zugang zu dem gewünschten Wissen zu erhalten, während sie auf der anderen Seite aber auch eine umfangreiche Autonomie der Biotechnologie-Unternehmen sicherstellen müssen, um deren unternehmerischen Spirit und ihre Innovationskraft nicht zu gefährden.

Zur genauen Untersuchung dieses Forschungsrätsels ist die Wahl einer geeigneten Forschungsmethodologie erforderlich, die wiederum stark von der Formulierung der Forschungsfrage abhängt. Auf dieser Basis hat sich die Fallstudienanalyse als sinnvollste Vorgehensweise herauskristallisiert. Durch Auswertung von durchgeführten Interviews, basierend auf einem halbstrukturierten Fragebogen, einer ausführlichen Analyse des Branchenkontextes sowie durch Einbeziehung umfangreichen Sekundärmaterials wurden die folgenden Fallstudien im Hinblick auf ihre Post-Merger Integrationsaktivitäten erstellt:

- Pharmacia & Upjohn, Inc. (jetzt: Pharmacia Corp.) – Sugen, Inc.
- Bayer Diagnostics Corp. – Chiron Diagnostics Corp.
- Merck KGaA – Lexigen Pharmaceuticals Corp.
- Sandoz AG (jetzt: Novartis AG) – SyStemix, Inc.
- Sandoz AG (jetzt: Novartis AG) – Genetic Therapy, Inc.

Im Rahmen dieser Fallstudien wurden dabei insbesondere die M&A-Motive, die übergeordnete Integrationsstrategie, das Management des Integrationsprozesses sowie relevante Aspekte der organisatorischen Zusammenarbeit, des Wissens- und Kompetenztransfers, der Akkulturation und einzelner personeller Problembereiche erörtert. Nach Untersuchung dieser Aspekte im Rahmen der Einzelfallanalysen wurde eine komparative Fallanalyse zur Identifikation von Gemeinsamkeiten und Unterschieden durchgeführt. Um die Verallgemeinerung dieser Ergebnisse zu erweitern, wurden darüber hinaus noch vier „Mini-Fallbeispiele“ herangezogen. Die gewonnenen Erkenntnisse wurden in vorläufigen Hypothesen zusammengefasst, welche die zentralen Aspekte der Integration von kleinen High-Tech-Unternehmen in die Struktur großer Unternehmen charakterisieren.

Diese aus der komparativen Fallanalyse gewonnenen Hypothesen bilden die Basis für einen ausführlichen Vergleich der erzielten Erkenntnisse mit den entspre-

chenden Empfehlungen der bestehenden Literatur. Hierzu wurden unterschiedliche Literaturströmungen und Studien herangezogen, die nicht nur auf die M&A- und Post-Merger Thematik begrenzt sind, sondern z.B. auch Internationalisierungskonzepte miteinbeziehen. Dabei wurden die unterschiedlichen Dimensionen untersucht (M&A-Motive, übergeordnete Integrationsstrategie, Management des Integrationsprozesses sowie relevante Aspekte der organisatorischen Zusammenarbeit, des Wissens- und Kompetenztransfers, der Akkulturation und einzelner personeller Problembereiche), die sich im Rahmen der Fallstudienanalyse als wichtig herausgestellt haben. Ziel der Konfrontation der in den vorläufigen Hypothesen zusammengefassten Fallstudienergebnisse mit der existierenden Theorie ist es aufzuzeigen, inwieweit diese Hypothesen mit den bestehenden Konzepten erklärt werden können. Das Ergebnis dieses Abgleichs ist, dass die bereits existierenden Konzepte nicht in der Lage sind, die im Rahmen der Fallstudienanalyse gewonnenen Erkenntnisse ausreichend zu erklären.

Aufgrund der herausgearbeiteten Unzulänglichkeiten der existierenden theoretischen Konzepte wird im Rahmen dieser Arbeit ein neues Konzept entworfen, welches auch für das Management der Post-Akquisitions Integration von kleinen High-Tech-Unternehmen in große Unternehmen geeignet ist. Dieses Konzept basiert auf zwei weiteren, weit verbreiteten und anerkannten Konzepten (Kernkompetenzen sowie Wertschöpfungskette). Zentraler Punkt des neuen Konzepts ist die Forderung nach einer expliziten Verknüpfung zwischen den Akquisitionsmotiven und der korrespondierenden Post-Akquisitions Integrationsstrategie. Dies bedeutet, dass Großunternehmen gleichzeitig zwei sehr unterschiedliche Integrationsstrategien auf ein kleines Unternehmen anwenden müssen. Einerseits verfolgen sie in einzelnen Bereichen, in denen die Kernkompetenzen beim Großunternehmen liegen, eine Absorptionsstrategie, während sie gleichzeitig für die innovativen und wissensintensiven Bereiche, in denen die Kernkompetenzen der kleinen High-Tech-Unternehmen gefordert sind, eine Autonomie- bzw. Erhaltungsstrategie anwenden, damit diese Kompetenzen aufrecht erhalten werden können. Dies wird im Ergebnis auch häufig dazu führen, dass sich die kleinen, wissensintensiven High-Tech-Unternehmen zu „Centers of Excellence“ innerhalb der Großunternehmen entwickeln.