UNIVERSIDAD AUTÓNOMA DE BARCELONA
DEPARTAMENTO DE ECONOMÍA DE LA EMPRESA

TESIS DOCTORAL

THE MANAGEMENT OF DYNAMIC CORE-CAPABILITIES AND THEIR INTERACTIONS WITH DIFFERENT TYPES OF DEVELOPMENT PROJECTS

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Fontenay aux Roses, 22.07.2004

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CHAPTER 1: PROBLEM STATEMENT AND PURPOSE

1.1 Problem Statement

One of the central themes the literature of strategic management is concerned with, refers to the problem of how a firm may create and sustain its competitive advantage over a longer period of time. Different schools of thought, with contrary points of view, have undertaken efforts to provide answers to that challenging question.

Because of the fact that this investigation focuses on the firm's "core" capabilities, it is based on a resource- and capability-oriented framework. According to the corresponding theory, the "***Resource-Based View"*** (RBV), the firm's competitive advantage is created and sustained with the help of firm-specific resources and capabilities that the organization has continuously accumulated and/or built. The firm's most distinctive capabilities, the so-called "core" capabilities are developed with enormous efforts and are deeply intertwined with the firm's overall performance. As **Leonard-Barton** (1992) describes, the strategic significance of core-capabilities has been supported by **Rumelt's** (1974) discovery that of nine diversification strategies, the two that were built on distinct resources and capabilities had been the most successful ones and were associated with the highest firm performance.

But especially firms operating in ambiguous fast changing industries like for example the high-tech sector cannot rest on their current core-capabilities for a longer time. They are permanently forced to respond to changing circumstances, like a decrease in customer demand, or an imitation of their capabilities by new entrants. To cope with those changes, such firms constantly have to develop, adapt, and renew their core-capabilities to stay competitive. According to **Teece** *et al*. (1997), a firm with "stable" competencies/resources will have its constant income for a certain period but its competitive advantage will be eroded in ambiguous environments. In other words, the firm will earn "Ricardian" rents from the existing demand for its products, but if its resources and competencies have no innovative/dynamic "potential", the firm cannot achieve other types of rents like for example "Schumpeterian" rents on innovative outputs that would be more long-lasting in fast changing industries.

As the development of the firm's current core-capabilities depends to a great extend on its former development path, it is crucial how the corporate management combines the experience from the past with the firm's future needs to cope with changing environments.

As **Rindova** *et al.* point out, recently published research stress the importance of managerial beliefs in the evolution of firm capabilities. I.e. **Rosenbloom** (2000) highlights that the firm's history (in his research case NCR) provides strong evidence and conclusions of the role that the corporate management played in recognizing (or failing to recognize) changes in the environment that required corresponding changes in management and organizational processes.

It is seen as an important strategic issue for the future (and current) performance if the corporate management assigned the right value to the various organizational capabilities. According to **Senge** (1990), for any successful understanding and development, the corporate management has to be aware of the *multidimensional* nature of its core-capabilities and has to understand the interconnections of their different dimensions. For example, new technical systems do not develop the firm performance until they are accompanied by new skills. New skills will not be applicable if the management is not able to provide the strategic context for them. New organizational values will not be established if associated behavior is not rewarded, etc.

Prahalad & Hamel (1991) found out that Japanese firms understand, develop, and exploit their core-capabilities better than their U.S.-based competitors. German firms neglected for a long time the strategic importance of core-capabilities in favor of "structural"-based theories like **Porter's** (1984) "competitive-forces" approach. Nowadays, orientating on the management practice of their global competitors, the corporate management teams of German firms are showing reinforced interest for capability-based strategies.

Penrose already noted in 1959 that firms have to be seen as "bundles of resources" that may be deployed into multiple "arenas". But to do this effectively, the corporate management need deep knowledge of the firm's internal capabilities. As **Teece** argues, nowadays this seems to be readily accomplished by management, however it is a nontrivial challenge, especially in complex organizations. While firms may have codified their inventory of tangible assets, intangible assets are less readily to detect and categorize. As the author underlines, the management is sometimes quite ignorant of the firms knowledge assets, and often path dependencies are created by the "cognitive inertia" of managerial beliefs

But even if the corporate management overcomes their "own" inertia and gains new insights, it is in general difficult to change accepted modes of behavior in the companies, because every organization is at the same time supported, but also constraint by its own accumulated resources and developed skills and routines. In many cases there is an *ambivalent* relationship between development activities and the firm's incumbent core-capabilities. The realization of new development projects often conflicts with the relative inertia of the entire organization against new forms of working behavior, especially if the projects depart to a larger extent from the original performance of the firm.

The core-capabilities may hinder in some cases a deviation from the firm's development path if the initiated products and/or processes require "untraditional" working behavior. As **Leonard-Barton** (1992) notes, in general, it is very difficult for the corporate management to change accepted modes of behavior in their companies. Therefore, the realization of development projects becomes a focal point of tension inside the organization. As the author further remarks, although this relationship is a

major structural problem in managing complex organizations today, there is little research-based knowledge on organizing such interaction between development projects and core-capabilities. As the researcher emphasizes, there is a need for further research in that field, considering that "part-whole" relationship.

Applying core-capability-based strategies presupposes that the management has built consensus on the following question:

- ***Which are our current core-capabilities?***
- ***Which of the firm's core-capabilities should be further developed?***
- ***Which effective possibilities does the company have to develop these capabilities?***
- ***How may the organization create the appropriate strategic context?***
- ***How can the corporate management align the whole organization with that strategy?***

Compared with the strategic management literature focussing on the structural aspects of markets (i.e. **Porter**, 1984), there exist few frameworks that support corporate managers to further develop their core-capabilities. Capabilities can be developed and complemented through various ways, but as **Teece** describes, the management literature does not provide enough guidelines to make the right investment decisions. While there is discussion of project financing criteria like discounted cash flow, payback period, etc., there is a lack in the recognition and assessment of the value creation process of capabilities in the long run.

1.2 Research Questions and Objectives

Focusing on the core-capabilities and their development with the help of projects, the general purpose of our investigation is to analyze the management of such development projects in high-tech companies. Here we are specifically interested in:

- How do companies select development projects in relation to the core-capability?
- How do companies plan the initiation of development projects?
- What are the companies strategies, procedures, and practices?
- Are particular structures and processes commonly used?
- How are the teams composed? What are the roles of individuals?
- What characteristics make a development project successful for the core-capabilities beyond the targeted outcome of a new product or process?

Going align with **Bowen *et al***. (1994), we intend to focus on development projects, because these projects are in many respects a microcosm of the whole organization, and thus enable deeper insights in complex organizational processes.

We intend to make a further analysis on:

- The "evolution" of the core-capabilities after the realization of the development projects in the organization. We are looking for empirical evidence that the core-capabilities are developing to a measurable extent after the realization of those projects.

- Those corporate management strategies that are appropriate to overcome the "inhibiting" influence and inertia of the core-capabilities during the realization of incongruent projects.

Our approach seeks to foster the link between intrapreneurship and the capability-driven approach in the field of strategic management, corroborating that the intrapreneurial context supports the building of a resource- and capability-focused organization. We intend to investigate which kinds of administrative and operational linkages, control- and motivation systems etc. the corporate management has created, to handle what **Burgelmann** (following **Miles** & **Snow** (1978)) calls the "autonomous" behavior, necessary for the implementation of corporate entrepreneurship.

The results of our research can serve to build/complement a frame of reference for the management of dynamic core-capabilities and their interactions with different types of development projects.

1.3 Structure of the Dissertation

Considering the structure of the work, in the second chapter we will describe the theoretical framework of the investigation, based on the resource-based view and its dynamic extension. Here we will also compare the strategic implications of resource- and capability-based strategies with the implications of structural-based approaches. We will further discuss the application of resource-based strategies as ownstanding corporate strategy. In this chapter, we are also going to draft the interaction of development projects and core-capabilities and their different "degrees of congruence".

In the following third chapter on Literature Review, we will introduce research themes that are in relation to our approach. Here we discuss the research work of **Marino, Hall, Leonard-Barton, Hall, Dougherty, Iansiti** & **Clark, Kuratko** *et al.,* **Carrier, Bonner** *et al.,* **Rycroft** & **Kash,** and **Danneels**. In chapter 4 we point out the underlying methodology of our research, highlighting some key issues and core-assumptions of qualitative research settings. We will further describe qualitative research designs as autonomous research strategies, appropriate and applicable in the field of organizational research. At this point we will make the link to our research, describing the formal design and

the different levels of research questions. To approach the complex phenomena of capabilities (which are intertwined with the entire organization), we diverted our analysis into various subgroups. According to **Miles** & **Hubermann,** this process should enable a more structured and detailed description of the organizations and their development projects.

In the chapters 5 to 8 we will describe the empirical case-study work, documenting the research cases of CARMEDIA, RECEIVE-TECHNOLOGIES, COMPUTEX, and ULMOD.COM. All the firms are operating in the high-tech industry. CARMEDIA and RECEIVE-TECHNOLOGIES are producers of semiconductor technology, COMPUTEX operates as a reseller/programmer of semiconductors, while ULMOD.COM as our forth case-study is offering services around the semiconductor communication technology.

In chapter 9 we make a cross-case comparison, relying on the propositions and on complementary research questions. Here we apply the so-called ***pattern matching method*** to reject/confirm our propositions. For this purpose, we engage to match our empirical findings with apriori constructed pattern of behavior. We constructed three patterns:

1) "Explicit awareness of core-capabilities".

2) "Degree of intrapreneurial context in the firm".

3) "Performance improvement after project completion".

In chapter 10 we draw a cross-case report, describing the management of dynamic core-capabilities, in particular their development with the help of initiated projects that depart from the original strengths of the firm. Following our different subcategories, we describe:

-The firm's self-analysis and consensus building process on its core-capabilities.

-The building of a strategic context that supports different kinds of project work and intrapreneurial activities in the organization.

-The creation of a set of visions for different hierarchical levels.

-The management practices for project integration; and the formulation of criteria for outsourcing decisions.

We also highlight the transformation process from project outcomes to organizational capabilities, or in other words, the creation of a learning organization. In our last chapter 11 we point out our main conclusions and refer to the shortcomings of the research. As an outlook view, we bring in some thoughts and suggestions for further research related to our approach.

CHAPTER 2: THE THEORETICAL FRAMEWORK: RELYING ON THE RESOURCE-BASED VIEW AND ITS DYNAMIC EXTENSION

2.1 Historical Review of the Resource-Based View

Reviewing the literature of strategy research, it can be noticed that the resource-based perspective has a long history of growing interest and contributions, and nowadays, as **Hoopes *et al***. (2003) formulate, dominates the conceptual landscape. It goes back to **Penrose** (1959), who lays (besides evolution economics) a major fundament with her work: "The Theory of the Growth of the Firm". The author provided basic conceptualizations on which key-authors of the resource-based view like **Teece** (1982), **Burgelmann** (1983) and **Wernerfelt** (1984) oriented on:

- Firms as bundles of fungible resources and services.
- Firm heterogeneity caused by differences in how resources and services are combined and used.
- Growth through related diversification. There exist an optimal pattern of firm expansion which requires a balanced use of internal, as well as external resources in a particular sequence (**Penrose**: 1959a)
- Path-dependency and growth rate: The so-called "Penrose effect" describes the limits to the firm's growth rate as a result of managerial constraints, and the importance of behavioral elements and learning in the firm's growth processes.

A stream of strategic literature from organization theory **Selznick** (1957), traditional business policy **Andrews (**1971**)**, stress the importance of distinctive competence. **Sloan** (1963), **Chandler** (1962, 1977), and **Rumelt** (1974) address firm performance to its competencies in applying and combining its human, physical, and reputational capital.

Rumelt highlights the historical centrality of the resource-based view, as well as its relation to the concept of business strategy, as follows: **"*In essence, the [strategy] concept is that a firm's competitive position is defined by a bundle of unique resources and relationships and that the task of general management is to adjust and renew these resources and relationships as time, competition, and change erode their value. This way of looking of the firm...[is] useful in describing and summarizing the empirical studies of firm behavior that form the core of the business policy literature*.** (1984: 557, in **Conner** (1991))

Conner (1991), **Mahoney** & **Pandian** (1990), **Teece**, **Pisano**, and **Shuen** (1990) are discussing whether the RBV-Approach could be viewed as a basis for an advanced paradigm for strategy research.

As the strategic literature postulates, an appropriate theory of the firm must address two central questions*:*

1) ***Why firms exist (their purpose)?***
2) ***What determines the firms' scale and scope (with regard to the trade-off between the benefits and cost of integration)?***

2.1.1 The Central Elements of the Resource-Based Theory

According to **Hoopes** *et al.*(2003), the resource-based view suggests how firms maintain a unique and sustainable position in a competitive economic environment. They are described as "seekers" of "costly-to-copy" inputs for production and distribution. Similar to theories in industrial economics, the firm's reason for its existence is to achieve above-normal returns (i.e. **Barney**, 1986; **Wernerfelt**, 1984). From the resource-based perspective, such returns requires either that:

- the firm's product is distinctive in the eyes of its buyers (attractive attribute position), or
- the firm is offering an identical but cheaper product (low cost position).

Here the critical problem is how to maintain either the "distinctiveness" of the product, or its low cost position. The RBV-approach demonstrates here a strong link between the "distinctiveness of the product" and the "distinctiveness of the inputs" (resources) used to build this product. According to **Conner** (1991), following this theory, we have to ask the strategic question which inputs have **(a)** the potential to generate rents, as well as **(b)** prevent rivals from copying that value over a long time:
ad a): Here entrepreneurial vision and intuition are the prerequisites for finding appropriate resources, but ***external*** and ***internal*** constraints prevent the firm to generate rents with them.

- ***External constraints*****:** As **Conner** describes (1991: 134)[1], there are three sources of external constraints: "Conditions of demand relevant to the product", "public policy", and "competitor action".
- ***Internal Constraints:*** As **Rumelt** (1974: 561) argues, a firm could be limited by its own development path. The firm is a bundle of internally linked and idiosyncratic resources and resource conversion and transformation activities that are also related to above-normal returns. Some resources will only produce rents in combination with other resources and this only in relation to the firms historical development path (or vice versa being hindered).[2]

ad b): Input characteristics that could be linked to sustainable rents**:** As **Dierickx & Cool** argue**,** any assets that can be traded on a market can not be sources of sustainable long-lived rents. Only inputs

[1] Referring to Porter's analytic framework (1980, 1985)
[2] This resource-based view is different both form Chicago's emphasis on *asset acquisition as opening up opportunities for scale economies*, and Bain-type IO's view of *asset acquisition as a means of gaining market power* over price through size or of overawing potential entrants through capital barriers or implicit threats of predation (Conner: 1991).

that cannot be bought, because they are learned by doing or are depending on the organizational culture, have the potential to generate sustainable rents. As **Foss** (2003) describes, according to **Barney**, a firm has a competitive advantage when it implements a value creating strategy that is not implemented by its competitors at the same time. But, it has ***sustained*** competitive advantage when its current or potential competitors are unable to duplicate the benefits of this strategy.

Foss (2003) comparing the frameworks of **Barney** (1991) and **Peteraf** (1993) explains that obtaining sustained competitive advantage in the sense of **Barney** makes it necessary that the underlying resources must have the following attributes:

- They must be valuable.
- They must be rare among a firm's current and potential competition.
- They must be inimitable.
- There cannot be strategicly equivalent substitutes for this resources that are valuable but neither rare or imperfectly imitably.

Sustainable competitive advantage in **Barney** (1991) is seen as: ***Unique value-creating product market strategies implemented in equilibrium.***

While **Peteraf** (1993) sees the cornerstones of competitive advantage in:

- Heterogeneity within an industry: Efficiency differences based on superior resources.
- Ex ante limits to competition: Resources should be acquired at a lower price.
- Imperfect resource mobility
- Ex post limits to competition: Difficulties of imitating highly efficient resource-bundles (**Dierickx & Cool** (1989).[3]

Sustainable competitive advantage in **Peteraf** (1993) is seen as: ***Differential profits/rents in excess of opportunity costs that are sustained in equilibrium.***

[3] **Dierickx & Cool** describe an analysis of ***mechanisms*** that "render inputs costly to copy".[3] These mechanisms include:

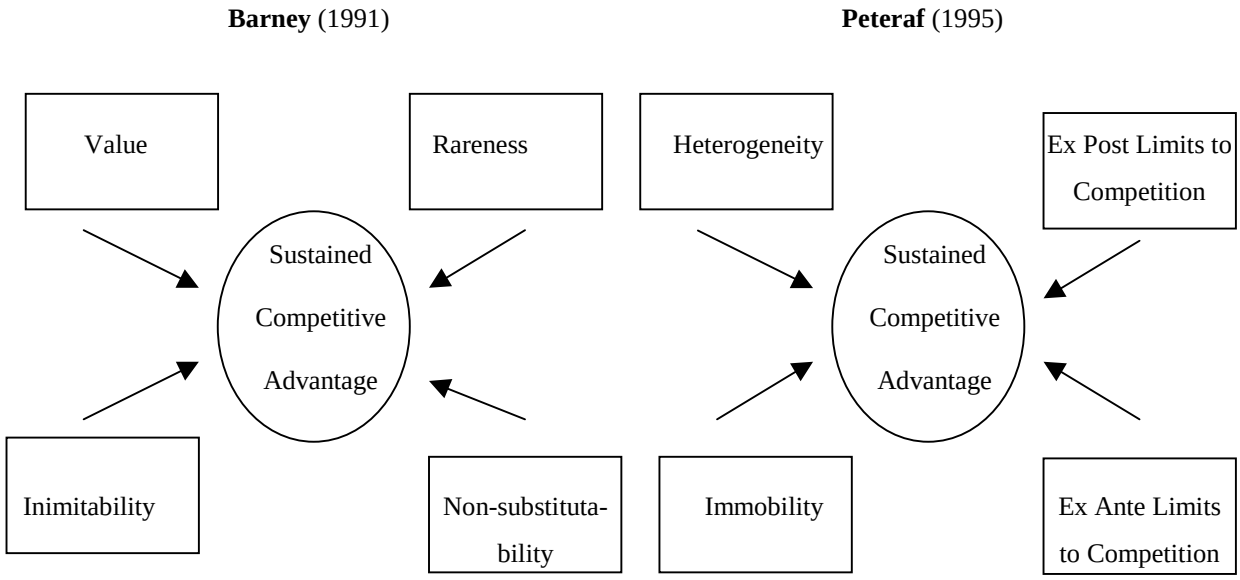
1.) ***Time compression diseconomies*** to imitation. Time compression diseconomies prevent a newcomer to catch up by simply purchasing the input.

2.) Cumulative ***increasing returns.*** Firms that already possess a substantial stock of resources can add additional resources at a lower cost than an entrant.

3.) A ***slow decay rate*** of input. For example "team-embodied" knowledge can generally be transmitted without significant knowledge "degradation" to the next generation.

4.) ***Specificity*** of the input to multiple other inputs in the firm's asset base (making it difficult for other firms with different asset bases to use the input as effectively).

Table 2.1: ***Comparing the Frameworks of Barney (1991) and Peteraf (1995)*** [4]



In a more recent work, **Peteraf** & **Bergen** define the "resource scarcity" in terms of "functionality" rather than in terms of resource "type": **"*When perfect substitutes are available, neither rareness nor even uniqueness of resource type is a limiting factor*"** (2003: 1028). The authors argue that neither rareness nor uniqueness of a resource can guarantee sustainable competitive advantage in case of perfect resource substitutes. Thus, firms do not in the first line face competition due to their competitors similar resources, but on the basis of whether their competitors resources can be used to meet similar customer needs.

With regard to the fact that increasing complexity in general complicates imitation**, Prahalad** & **Hamel** emphasize the firm's (in general complex) "core-competencies" as sustainable rent generators, which involve "***the collective learning in the organization, especially how to coordinate diverse production skills and integrate multiple streams of technology"*** (1990: 82).

Teece, Pisano & Shuen focus on non-purchasable, intangible assets, emphasizing "***the mechanisms by which firms learn and accumulate new skills and capabilities"*** (1990: 11). Also **Winter** (1987) considers intangible knowledge and competence as key strategic asset. **Itami** (1987: 12) stresses the importance of "invisible assets", which include "consumer trust", "brand image", "control of distribution", "corporate culture", and "management skills" for the sustainment of the firm's competitive advantage.

In addition, **Rumelt** (1984) notes that sustainable rents can be also built from "legally imposed" isolating mechanisms, such as patents, copyright, and trademark law, etc.

[4] FOSS, N.J. (2003): "The Resource-Based View: Historical Roots, Basisc Analysis, Extensions, Criticisms, and Future Development". Working paper, Copenhagen Business School, Bocconi 24.Feb.

2.1.2 Applying the Resource-Based Theory for the Specifties of Development Projects

Viewing development projects as a magnifying glass for the whole firm, we intend to apply the theoretical framework of the RBV for the specifties of these development projects. If the corporate management wants to initiate a development project, it has several possibilities. It may initiate the project: [5]

a) strictly or partly by an in-house team, or

b) totally by an outside team on a contract basis.

As **Conner** (1991) describes, if the development project has the potential to be closely linked with the firm's existing operations and routines, option (a) will be more efficient than option (b). Such an in-house project team will probably produce new specific technological knowledge, skill, or routines that fit better with the firm's current activities. Additionally, with regard to the transmission of tacit knowledge and learning, the value of the development project may come from the development process itself, by transmitting know-how and routines that cant be exactly planned. As the author points out: "..***the research investment may generate greater gains when the possessor of that know-how is continuously and intimately engaged in applying the know-how to the manufacturer to the existing products, the design and manufacture of other products, or the undertaking of follow-on research***".

So to speak, when the new project is congruent with the core capabilities of the firm, the created value is higher when the know-how possessor is a permanent employee. Furthermore, an internal employee who knows the firm's culture, routines, etc. should be better able than an outsider to transmit/translate such know-how in a way that helps implementation elsewhere in the firm. As the author argues, option (a) does not only increase the likelihood of generating new applicable resources, but also improves the efficiency of the current operational performance. **T**he scale and scope of the firm depends on the degree to which new development activities are specific to the firm's existing asset base. Thus, the firm's limits to integration are coming from a lack of specificity. Taking up these arguments, we make the proposition that even activities that are not specific to the firms existing core-capabilities may increase the firms competitive advantage in the long run if properly managed with an in-house team supported by an appropriate strategic context.

Following the resource-based view, team-specific assets within the firm will be more specific to other teams inside the firm than to teams outside the firm, and hence more productive. This view of the reason for the firm's existence goes align with the field of resource-based literature (i.e. **Teece, Pisano**, & **Shuen**, 1990: **Wernerfelt**, 1984).

[5] This two possibilities could be linked to the second central question above that a theory of the firm should be able to explain, the size and scope of a firm.

2.2 A Comparison of the Strategic Implications from Resource-Based Theories and Structural Market Approaches

As **Barney** (1996) notes, most of the interest from the field of business strategy in the resource-based view refers to the understanding of its implications for everydays management practice. We compare in the following the strategic implications of the resource-based theory with its so to speak complementary paradigm, the **"*competitive forces approach*".**

2.2.1. The Competitive Forces Paradigm: A Strategy Model Emphasizing the Exploitation of Market Power

According to **Teece** *et al.* (1997), the dominant paradigm in the field during the 1980s was the "competitive forces" approach developed by **Porter** (1980). This approach, rooted in the "structure-conduct-performance" paradigm of industrial organization (**Mason**, 1949; **Bain**, 1959), emphasizing the actions that a firm can take to create a "defensible" position against competitive forces. As **Teece** *et al.* (1997) explain, the competitive forces approach views the essence of competitive strategy formulation as "***relating a company to its environment . . . the key aspect of the firm's environment is the industry/industries in which it competes***". Thus, industry structure strongly influences the competitive rules as well as the strategies that are available to the firms. In the competitive forces model, there are existing five industry-level forces:

- ***Entry barriers***
- ***Threat of substitution***
- ***Bargaining power of buyers***
- ***Bargaining power of suppliers,*** *and*
- ***Rivalry among industry incumbents.***

These industry-level forces determine the inherent ***profit potential*** of an industry or a respective subsegment of that industry. **Porter's** approach provides strategic implications for the firm to find a position in an industry from which it can in the most efficient way defend itself against the competitive forces (**Porter**, 1980: 4).

Porter's framework provides a systematic way of thinking about how competitive forces work at the ***industry level*** rather than at the firm level. He describes firm performance as a function of industry and market positioning. If the company has achieved an attractive position, it can exercise market power and thus, gain "monopoly-type" rents. Firms in an industry earn such monopoly rents when they are somehow able to hinder the competitive forces (in either "factor" markets or "product" mar-

kets) which tend to erode the competitive advantage. Some industries or subsectors of industries become more "attractive" because they have ***structural entry barriers*** to the competitive forces that give firms better opportunities to sustain their competitive advantage. As **Teece** *et al*. explain, **Porter's** competitive strategies are often directed to the firm's position in the industry vis-a-vis its competitors and suppliers. Therefore, industry structure plays a central role in determining and limiting such strategic action.

An entry decision into a new market could be described as follows:

1) Pick an industry (based on its "structural attractiveness").
2) Chose an entry strategy based on conjectures about competitors' rational strategies.
3) If not already possessed, acquire or otherwise obtain the requisite assets to compete in the market.

From this perspective, the process of identifying and developing the requisite assets is not particularly problematic. The process involves "only" choosing rationally among a well-defined set of investment alternatives. If these assets are not already owned, they can be bought. But as described, a stream of strategic literature does not go align with these argumentation of the relative "neutral" value of resources for the sustainment of the firm's competitive advantage. **Rumelt** (1991) confronts this point of view with his empirical findings that inter-industry variation in returns are significantly lower than intra-industry variation. Firm specific assets play a major role as business level and corporation specific factors account for 37% while industry factors for only 16% of the variation in returns. The author concludes that the firms' owned assets are more relevant than its economic environment.

Spanos *et al*. (2001), trying to integrate both approaches, argue that empirical findings suggest that industry and firm specific effects are both important, but explain different dimensions of performance. As the authors note, research drawing from traditional Industrial Organization and more specifically from **Porter's** framework of competitive strategy adopts an "outside-in" perspective regarding market structure and its effect on performance. On the other hand, the more recent resource-based perspective redirects attention into idiosyncratic firm capital and postulates that performance is ultimately a return to unique assets owned and controlled by the firm. Their study propose a composite framework arguing that the resource-based approach provides the "Strength-Weaknesses" part of the overall **SWOT** framework, while industry analysis supplies the "Opportunities-Threats" part. The authors see the two approaches as complementary simply because they cover different domains of applications: "***Our results seem to suggest that industry and firm effects are not only both potentially significant, but instead, they need to complement each other given that they affect distinct but strongly linked dimensions of performance"*** (2001: 922).

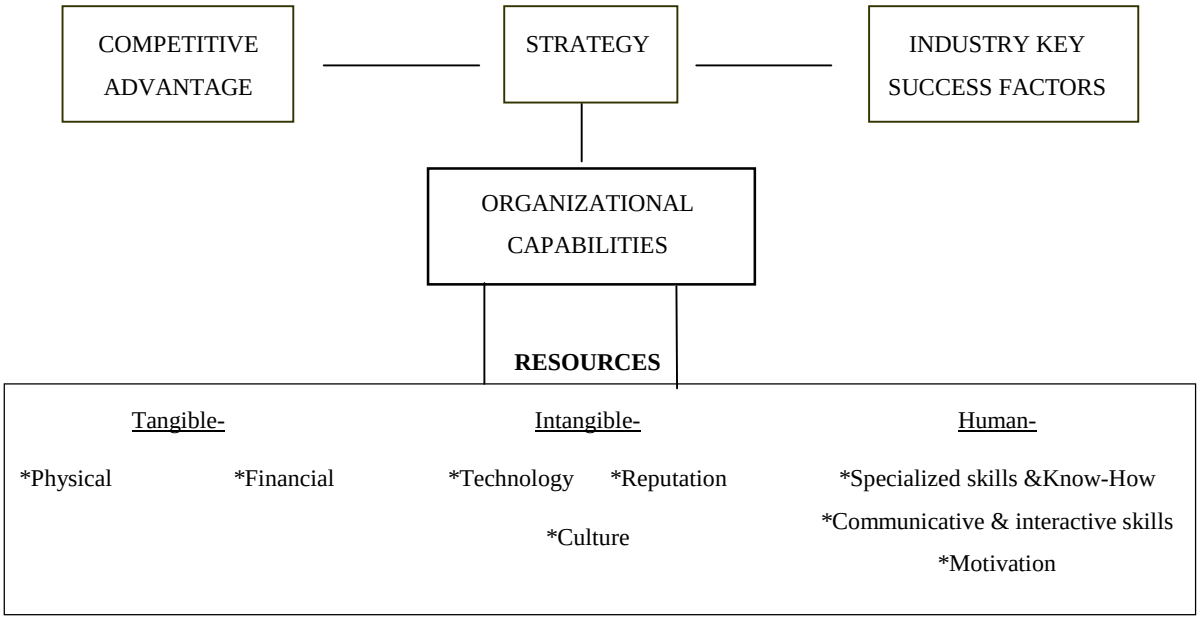
Lopez (2001) and **Lopez & Veciana** (2004) conclude from their empirical study on the "key" success factors of travel agencies in Spain that both strategies should be used in a complementary way.

Schendel (1997) corroborates that both, competitive position and capabilities have their own role in performance. But while these roles are relatively unproblematic to determine in theory, they are difficult to separate from each other in everydays working life. As the author describes, organizational capabilities, competition, strategy, and performance are fundamental endogenous leading to ”reciprocal interactions” between them. It will bring more use for the strategic field to understand these reciprocal interactions than to continue to search for arguments whether the implications of the market-based theory or the resource-based theory are more important for the sustainable competitive advantage.

2.2.2 Implications from Resource-based Theory: The Application of "Core"-Capabilities as Key Concept of Strategy

The basic concept of "capabilities" has already existed for some time**,** but the application of "core" capabilities as a key component of strategy is relatively new and the application process itself is not yet completely clarified. It was **Ansoff** (1962), who originally used the term "capability" to describe the company's ability to deal with different combinations of competitive environments. But he considered "***strategy development***" and "***capability development***" as independent separate processes.

Figure 2.1: ***Resources, Capabilities, and Competitive advantage: The Basic Relationships***

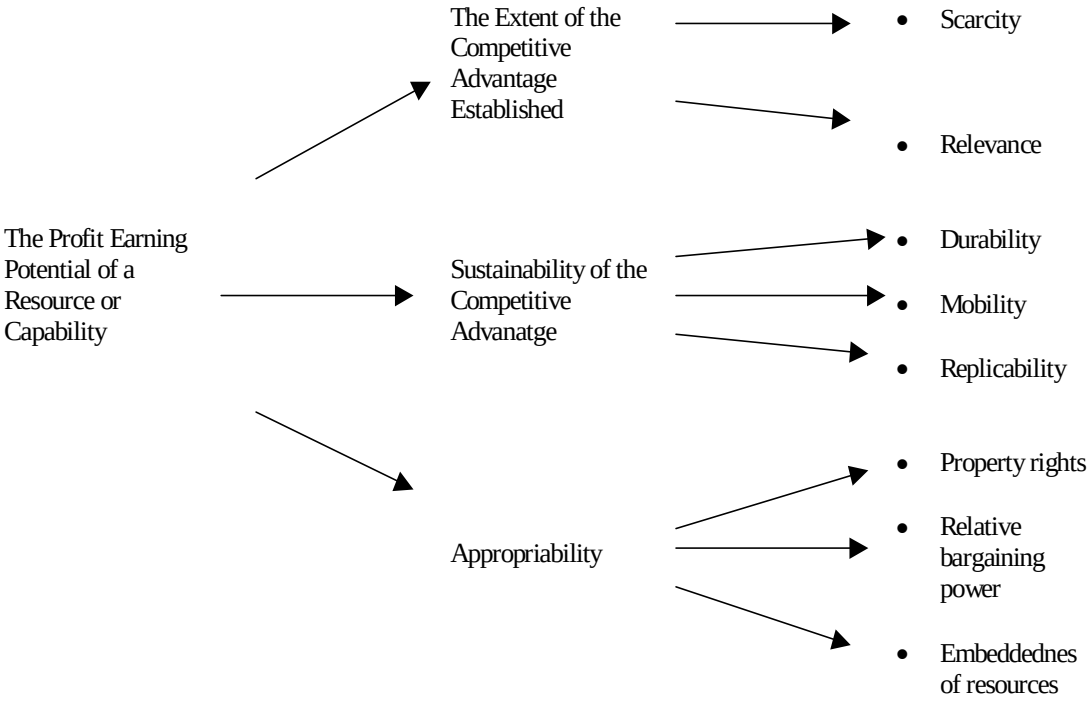


In GRANT, R. (1995): ”Contemporary Strategy Analysis: Concepts, Techniques, Applications”, Blackwell Publishers, Cambridge, Massachussetts.

Nowadays, the consideration of capabilities as an *own* component of strategy achieves broader attention. As already described before, the corresponding theory, the so-called **"resource-based view"** (RBV), emphasizes "firm-level-efficiency" advantages. Firms with superior systems and structures are profitable, because they have ***lower costs*** and/or offer a ***higher quality*** of product/services as their competitors in the same industry sector. That way, these firms earn so-called "Ricardian" rents.

Already mentioned by **Learned** *et al.* (1969), the real key to a company's success lies in its ability to establish "***a competence that is truly distinctive***". As **Teece *et al***. (1997) remark, new "impetus" has been given to the resource-based approach by theoretical developments in ***organizational economics*** and in the ***theory of strategy***. A growing body of empirical literature found significant performance- and profit differences among firms that belong to the ***same*** strategic industry group (**Cool** & **Schendel**, 1988; **Rumelt**, 1991).

Figure 2.2: ***Appraising the Profit Earning Potential of Resources and Capabilities***



In GRANT, R. (1995): "Contemporary Strategy Analysis: Concepts, Techniques, Applications", Blackwell Publishers, Cambridge, Massachussetts

A strategic entry decision process into a new market guided by the resource-based approach looks as follows:

1) Identify your firm's unique resources.

2) Decide in which markets those resources can earn the highest rents.

3) Decide whether the rents from those assets are most effectively utilized by

-integrating into related market(s),

-selling the relevant intermediate output to related firms, or

-selling the assets themselves to a firm in related businesses (**Teece**, 1980, 1982).

The resource-based perspective gives new strategic explanations for both ***vertical integration*** and ***diversification.*** Both can be viewed as ways of capturing rents on scarce, firm-specific assets whose services are difficult to sell in intermediate markets (**Penrose**, 1959; **Williamson**, 1975; **Teece**, 1980, 1982, 1986a, 1986b; **Wernerfelt**, 1984). Empirical work on the relationship between performance and diversification by **Wernerfelt** & **Montgomery** (1988) provides evidence for this proposition.

In spite of the fact that the resource-based perspective focuses on strategies for exploiting existing firm-specific assets, it also motivates the development of new capabilities (**Wernerfelt**, 1984). According to **Teece** *et al*. in this future orientation, management of know-how encompassing skill acquisition, learning, and accumulation of organizational and intangible or "invisible" assets (**Itami** and **Roehl**, 1987), lies the greatest potential for contributions to strategy.

2.3 The Dynamic Capability Approach: Overview

Teece, **Pisano** and **Shuen** (1990) define core-capabilities as ***"a set of differentiated skills, complementary assets, and routines that provide the basis for a firm's competitive capacities and sustainable advantage in a particular business"*** (1990:28).

According to **Wernerfelt** (1984), although the RBV focuses on strategies for the exploitation of ***already existing*** firm-specific assets, it provides first steps to design managerial strategies for the development of new capabilities. Firms operating in high-technology industries such as semiconductors, information services-, and software industry need an "expanded" approach to understand how their competitive advantage may be sustained in the long run. According to **Teece** *et al.* (1997), an extension of the resource-based view is emerging that emphasizes the key role of strategic management as appropriately ***adapting***, and ***reconfiguring*** capabilities and competencies "***to match the requirements of a changing environment***". This extension of the resource-based theory refers in the first line to two key aspects:

1.) How to develop competencies and capabilities?

2.) How to adapt to a changing business environment?

It builds upon the theoretical foundations provided by **Penrose** (1959), **Williamson** (1975, 1985), **Barney** (1986), **Nelson** and **Winter** (1982), **Teece** (1988), and **Teece *et al***. (1994).

The global competitive situation in high-technology industries such as semiconductors, information services, and software has highlighted the need for an expanded paradigm to understand how competitive advantage is nowadays achieved. Companies like IBM, Texas Instruments, Philips, have applied a resource-based strategy of accumulating valuable technology assets. However, this strategy is often not enough to support a significant competitive advantage over a longer time. According to **Teece** *et al*., efficient performers in the global market place have been firms that can demonstrate as well "timely responsiveness" and rapid/flexible product innovation.

Moreover, they possess the management capability to effectively coordinate and redeploy internal and external competencies. Researchers in that field have remarked that companies can accumulate a large stock of valuable technology assets and still not have many useful capabilities. **Teece** *et al.* describe this ability to achieve new forms of competitive advantage as "dynamic capabilities". They emphasize two key aspects that were not the main focus of attention in previous strategy perspectives.

The term "dynamic" refers to the capacity to renew competencies as well as to achieve congruence with the changing business environment. As **Teece** *et al* point out, certain innovative responses are required when for example the rate of technological change is rapid, and the nature of future competition and markets are ambiguous.

The term "capabilities" emphasizes as described before a "***key role of strategic management in appropriately adapting, integrating and reconfiguring internal and external organizational skills, resources, and functional competencies to match the requirements of a changing environment***".

One major aspect of the strategic problem facing an innovating firm is to identify difficult-to-imitate valuable internal and external competencies. Thus, as argued by **Dierickx** and **Cool** (1989), choices about how much to spend (invest) on different possible areas are central to the firm's strategy. However, choices about core-competencies are influenced by past choices on the firm's development path. This development path not only defines what choices a firm could do today, but it also determines to a large extend what possibilities it has in the future.

As the authors explain, only recently have researchers begun to focus on the issues of how organization develop firm-specific capabilities and how they renew competencies to cope with shifts in their economic environment. These issues are strongly linked to the firm's business processes, market positions, and expansion paths. Several authors have described how firms can develop their capability to adapt and even capitalize on rapidly changing environments. We go align with **Teece** *et al*, who state that the capabilities approach has the potential to provide an encompassing frame of reference which can both integrate existing conceptual and empirical knowledge, and facilitate prescription.

Table 2.2: ***"Complementary" Paradigms of Strategy*** (**Teece *et al***., 1997):

Paradigm	**Intellectual Roots**	**Representative Authors addressing Management Questions**	**Nature of Rents**	**Unit of Analysis**
Competitive Forces Approach	Mason Bain	Porter	Monopolistic Rents	Industries, Firms, Products
Resource-Based View	Penrose	Rumelt, Wernerfelt, Teece	Ricardian Rents	Resources
Dynamic-Capability Perspective	Nelson, Winter, Teece	Dosi & Teece & Winter Prahalad & Hamel Hayes & Wheelwright Dierickx & Cool	Ricardian Rents Schumpeterian Rents	Processes, Positions, Development Paths

2.3.1 Core-Capabilities as Research Object

Long & **Vickers** (1995) provide an example, how two financial institutes, both specialized on customer service, created distinctive "core" capabilities in the same industry sector. While bank **A** focuses on its ability to create capabilities that provide customer service at the ***individual customer level***, bank **B** focuses on customer services at the ***community level***. Bank **A** needs to hire and train a

large number of "base-line" employees providing personal service to individuals. For that aim, it has developed special processes that help each employee to serve about 1,200 customers with personalized service. Bank **B** is concerned with the needs of entire communities and therefore hires and trains bank presidents who have deep roots in their lokal communities.

As **Leonard-Barton** (1990) explains, each "core" capability draws upon only some of a company's skills and knowledge bases, systems and values. Not only are some skills, systems and norms outside the domain of a particular "core" capability, but some may be outside ***all*** "core" capabilities, as neither unique nor distinctly advantageous. Such capabilities are called "basic" or "support" capabilities. For instance, although every company has personnel and pay systems, they may not constitute an important dimension of any "core" capability.

We can classify the core-capabilities into different types:

- Regulatory capabilities (protectable by law)
- Positional capabilities (previous history)
- Functional capabilities (skills and experience)
- Cultural capabilities (the organization as a whole)

According to **Coyne** (1984), the firms competitive advantage results from a so-called core-capability "differential", a margin between the value of the firm's own capabilities and the capabilities of its competitors (valued by key customers).

As **Long &Vickers** (1995) note, the strategic literature often uses the terms ***"core-competence***" and ***"core-capability***" interchangeable. But, while the term "competence" is emphasizing a certain technology and/or production expertise at ***specific*** points along the value chain, "capabilities" are more broadly based and encompass the ***entire*** value chain.

For example, the product portfolio of CARMEDIA results out of a combination of three core-***competencies***:

a) "Miniaturization of electronic components"

b) "Integration of various attributes"

c) "Innovativeness of technical solutions"

A core-***capability*** combines and links these core-competencies together for the production of the product portfolio. While CARMEDIA's core-capabilities enable the firm to produce with a higher quality than its competitors, they sustain the company's competitive advantage in that industry sector.

Table 2.3: **CARMEDIA's *Core-Competencies*** *(every product results out of at least one competence)*

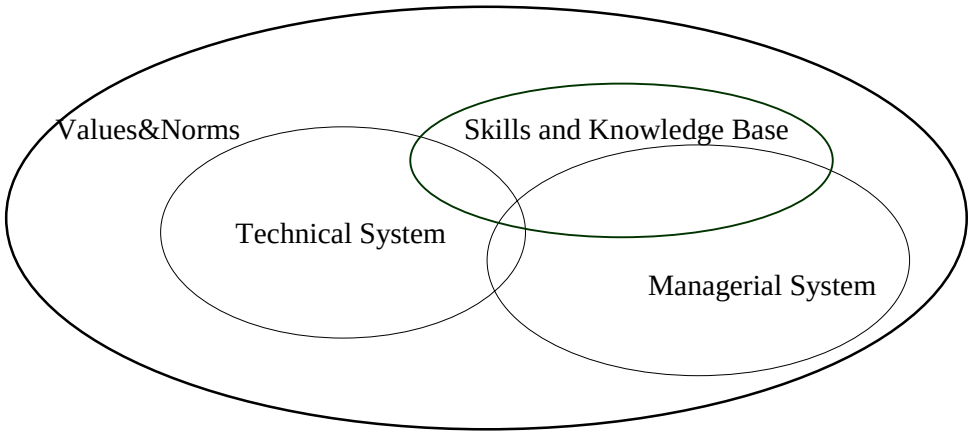
"Core" Competences / **Products**	**"Miniaturization"**	**"Integration"**	**"Innovativeness"**
Product A	X	X	X
Product B	X		X

Core-capabilities may be described as ***business processes*** that the firm has created to transform its special know-how into products and/or services. They encompass and link different dimensions together.

Initiated projects "interact" with the "core" capabilities along their various dimensions. As we will describe in the next chapter, the extent of the mutual influence (and also the severity of the arising conflict) depends on the "degree of congruence" of the development projects with the particular dimensions of the "core" capability. As **Leonard-Barton** remarks, "***from technical to managerial systems, skills and then values, the dimensions are increasingly less tangible, less visible and less explicitly codified***".

For example, the initialization of a development project will prove to be very difficult if the project is incongruent with the culture dimension of a "core" capability. It will be very challenging to change the company's culture during the time of the project.

Figure 2.3: ***The different Dimensions of a Core-Capability***

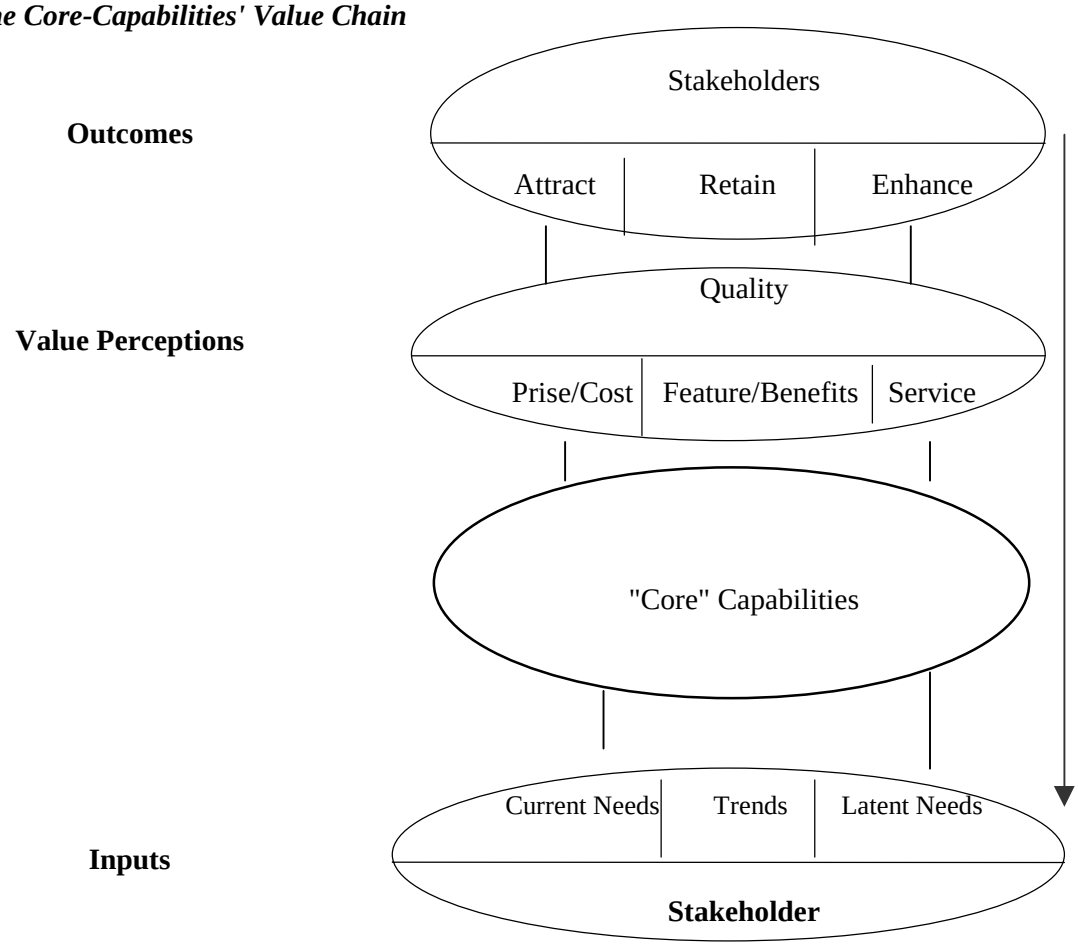


In LEONARD-BARTON (1992): "Core Capabilities and Core Rigidities: A Paradox in Managing New Product Development", in Strategic Management Journal Vol.13, p114.

2.3.1.1 Relating Core-Capabilities to Customers' "Key Buying Criteria"

According to **Hall** (1993), a company may establish a sustainable competitive advantage if it consistently offers products and/or services with attributes that correspond to the "***key buying criteria***" of its customers (for example: ***price, specification, reliability, aesthetics, functionality, availability, image***, etc.). That also signifies that any company's competitive advantage has to be evaluated out of the customers' perspective.

Figure 2.4: ***The Core-Capabilities' Value Chain***



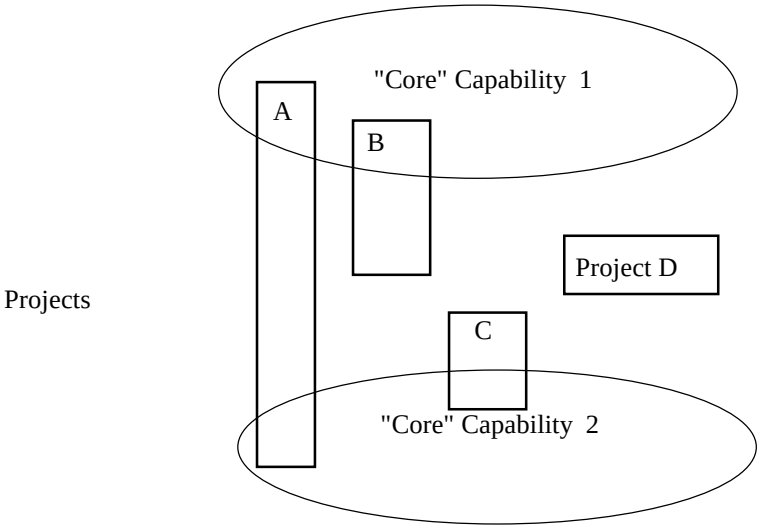
In LONG, C.& VICKERS-KOCH, M. (1995): ”Using "Core" Capabilities to Create Competitive Advantage”, in Organizatonal Dynamics, Summer 1995, pp.7-22.

Long & **Vickers** (1995) underline that for a successful performance, the corporate management needs on the one hand to look "inward" to understand its own specific capabilities, and on the other hand to look "outward" to identify the "key buying criteria" of its customers. Sustainable competitive advantage results from the company’s ability to keep its "core" capabilities and its opportunities in balance.

2.3.2 The Interactions of Development Projects and Core-Capabilities

2.3.2.1 The Different "Degrees of Congruence" between Development Projects and Core-Capabilities

Figure 2.5: ***Possible Alignments of New Product and/or Process Development Projects with Current Core-Capabilities at a Point in Time***



In LEONARD-BARTON (1992): "Core Capabilities and Core Rigidities: A Paradox in Managing New Product Development", in Strategic Management Journal Vol.13, p115.

As **Leonard-Barton** describes, the "interaction" between development projects and current core-capabilities normally lasts from a period of months until some years and differs in the "degree of congruence" with the core-capabilities.

Definitions:

- ***Congruent projects*** (Project A) go align with the core-processes of the firm, building on its current know-how and experience.

- ***Inconguent projects*** (Project **D**) do not necessarily involve "radical" innovations, but they depart from the traditional strengths of the organization and challenge new behavior, i.e. to work with cross-departmental teams.

While congruent projects achieve rich support from the "core" capabilities, the same capabilities may prove to be dysfunctional and may inhibit the realization of the incongruent project.

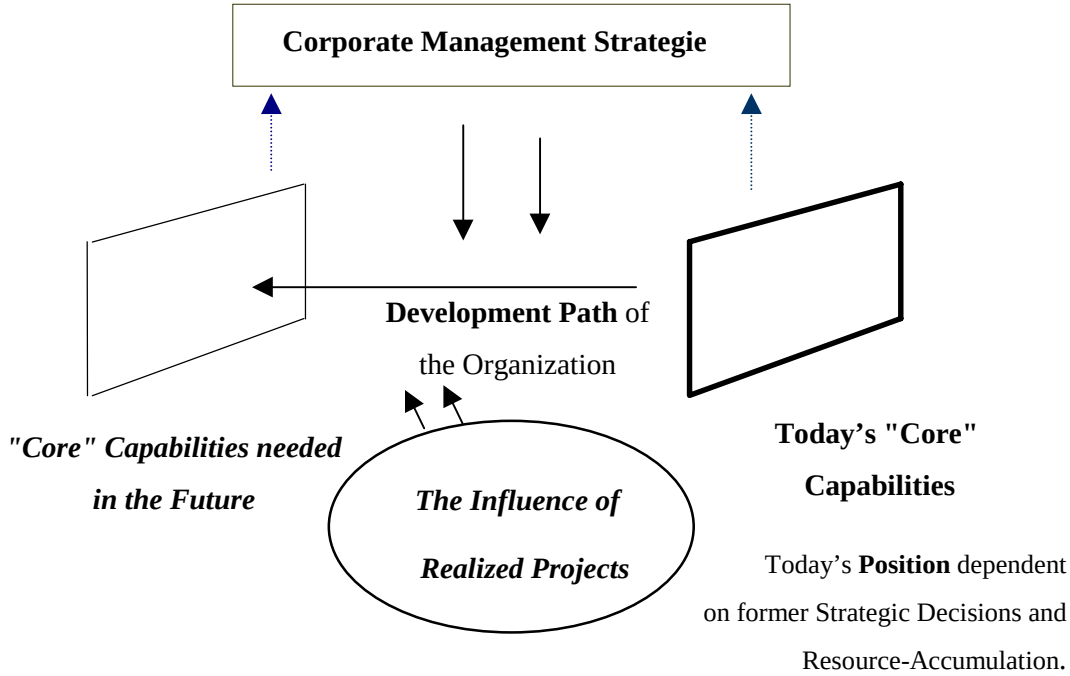
2.3.2.2 The Influence of Projects on the Development Path of the Firm

Necessary for an effective development of the firm's current core-capabilities is the consideration of the company's past development decisions and its already accumulated "resource stock". **Teece** *et al.* (1997) note, "***where a firm can go is a function of its current position and the path ahead. Its cur-***

rent position is shaped by the path it has traveled. Thus a firm's previous investments and its repertoires of routines (its 'history') constrain its future behavior".

Although in the normal case, the core-capabilities will not be dramatically altered by a single development project, such projects may be a source for organizational development, because they highlight the core-**rigidities** of the firm and thus may stimulate organization-wide learning and adaptation. For example, if an initiated project needs cross-divisional skills that are not yet established, it gives "impetus" for their development. This adaptation may influence some of the traditional skills and routines, and that way enhance the firms repertoire of performance. But if the "dysfunctional side" of a core-capability inhibits too many strategically important projects, the project managers of those projects will demonstrate that this "core" capability needs to be replaced if the firm's survival in the long run may be guaranteed.

Figure 2.6: ***The "Evolution" of Core-Capabilities along the Development Path***



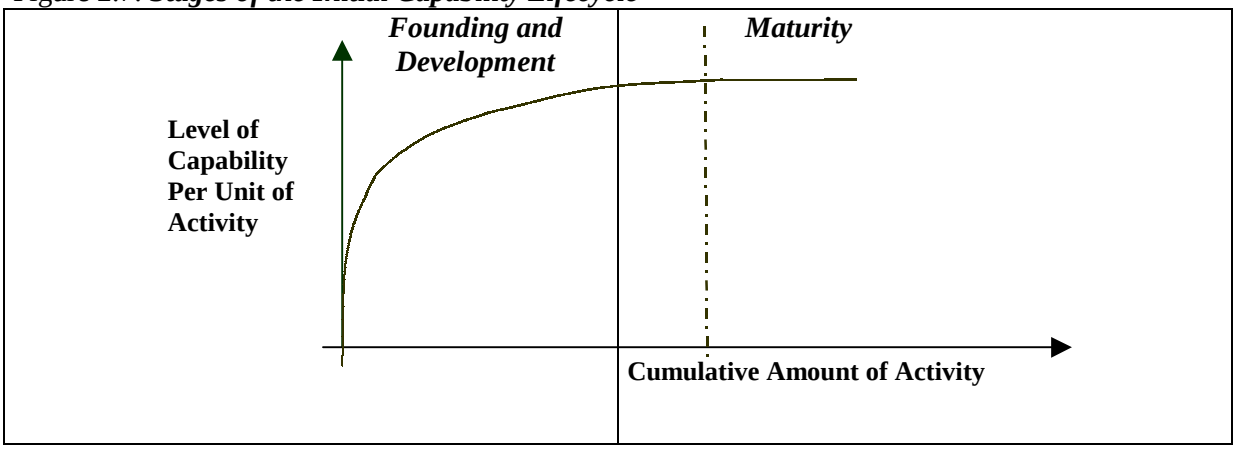
2.3.3 The Life-Cycle Concept of Dynamic (Core-)Capabilities

Our theoretical framework goes align with the ***capability lifecycle concept*** of **Helfat** & **Peteraf** (2003) which describes general patterns and paths in the evolution of organizational capabilities over time, and thus, so to speak makes the resource-based theory dynamic. As the authors argue***, the dynamic RBV must include, as one of its prime component, an understanding of the evolution of resources and capabilities. Otherwise the dynamic resource-based view cannot go on to effectively answer questions about competitive advantage and disadvantage over time based on capabilities and resources"*** (2003: 1008).

The authors derive their approach from evolutionary economics (**Nelson** & **Winter**, 1982) considering the "regularities" among the evolutionary "trajectories" of capabilities. Analog to the regularities that can be found in a product lifecycle, the capability lifecycle describes different stages of capabilities, such as ***growth***, ***maturity*** and ***decline***.

In contrast to the dynamic capability approach which differs clearly between "dynamic" and "non-dynamic" capabilities, **Helfat** & **Peteraf** (2003) attribute to all organizational capabilities a "dynamic" moment. In their view, "non-dynamic" capabilities do not necessarily need "dynamic" capabilities to be changed. This change happens in a more evolutionary way along those trajectories. In general, all types of capabilities include two sorts of routines, on the one hand the routines that perform the individual tasks, and on the other hand the routines that coordinate those tasks. This coordination happens most efficiently within a team. Therefore, the capability lifecycle concept focuses in the first line on the evolution of organizational capabilities that reside within teams.

Figure 2.7: ***Stages of the Initial Capability Lifecycle***



In HELFAT, C.H. & PETERAF M.A. (2003):" The Dynamic Resource-based View: Capability Lifecycles." Vol 24, p.1003.

The capability lifecycle includes several stages:

- ***The founding stage*** lays the basis for subsequent development of the capability. The capability may be new for the organization, but not necessarily "new to the world". The founding stage has two general requirements:
  a) The organization of a team.
  b) The central objective, the achievement encompassing the creation of a new capability.
- ***The development stage*** follows this initial stage, marked by gradual building of the capability.
- ***The maturity stage***: After a certain time period, the capability ceases and the capability reaches the maturity stage.

As the authors note, capability development may end simply because capabilities may have inherent limits to what any team could achieve with available technologies, inputs, workers, and state of managerial practice. Here it depends of how well the capability is maintained, or in other words how often and how consistently the team exercises the capability.

If there occurs a critical internal or external "event", like the "change of demand" or the "availability of inputs" the current development trajectory of the capability may be changed (so-called "branching"). **Helfat** & **Peteraf** describe six "branches" of the capability lifecycle which represent a general set of potential alternative paths. The authors define those branches in relation to **Winter**'s (1996) "4 Rs of Profitability":[6]

- Retirement (death)
- Retrenchment
- Renewal: To renew after a crisis to improve efficiency.
- Replication: Reproducing the capability for the same product/service into another market sector Redeployment: Reproducing the capability for a different but closely related product (depending from definition)
- Recombination of the existing capability with another capability to serve a different but related market. As the authors not, this idea of capability recombination draws on the concept of knowledge recombination in innovation

As noted above, these six possibilities of capability transformation happen as reaction to a "selection event" which could be a threat, but also a new opportunity.

[6] In WINTER, S. (1996): "Four Rs of Profitability: Rents, Resources, Routines, and Replication", in Resource-Based and Evolutionary Theories of the Firm, Montgomery C (ed). Kluver: Norvell, MA, pp.147-178.

CHAPTER 3: LITERATURE REVIEW

3.1 Developing Consensus on Firm Competences and Capabilities: K. Marino

Marino[7] (1996) describes in his research report the experience of three management teams who are seeking for a framework that facilitates the consensus building process of their firms' core-capabilities. He introduces a concept for guiding corporate managers towards consensus decisions and shared understanding about the crucial assets of their firms. **Marino** records the experiences of the three management teams while they are applying this consensus building process. From the results of this analysis, he derives and generalizes advanced guidelines for using this process in other organizations.

As **Marino** describes (1996: 41), "*...**in order to employ a resource-driven approach to strategy formulation, the management will be challenged on two fronts. First, the team must shift through the myriad of resources controlled by the firm and identify those that promise a sustainable competitive advantage. Second, the team must form agreement and consensus regarding those resources.**"*

As the author notes, the process of consensus building on the firm's strengths had been a central topic in management research for quite some time, and had been as well an important issue in the study of top management teams. In these studies, "consensus" had been positively related to a variety of performance indicators. But the agreement on the resources and capabilities controlled by a firm had been studied less frequently, but then with similar results. **Marino** is introducing a process model for consensus development that encompasses all the elements of the traditional strategic planning model separated in two phases:

I) The first phase focuses on the internal assessment of the firm's resources. As **Marino** explains, the steps in the first phase reflect three believes:

- resources should be assessed from the customers' perspectives,
- the current, existing resource base is the appropriate starting point, and
- the rigorous application of **Prahalad** & **Hamel**'s rules is the best way to maintain objectivity and avoid the pathology of "groupthink".

[7] MARINO, K. (1996): "Developing Consensus on Firm Competencies and Capabilities", in Academy of Management Executive, Vol.10, No.3, pp.40-52.

II) The second phase is future-oriented and involves decisions about the resource development and new product/market opportunities. Within this phase, the requisites of the external economic environment will be assessed and matched with the existing internal capabilities.

As described above, the process was employed by management groups in three manufacturing subsidiaries of public companies. The organizations varied in size and in the composition of the consensus-seeking group. But, as **Marino** argues, the firms are similar in that each firm manufactures and supports a limited group of core-products for industrial customers and working profitably.

Table 3.1**:** ***Results of Consensus Building Process***

	Summary of Process Outcomes **Phase I**	**PhaseII**
Organization	***Competencies Identified***	***Decisions affected***
Engine Design & Manufacture	1) Turbo Machinery Technology 2) Custom Mfg & Design 3) After-sale Support	• Backward integration of fuel injectors and electronic controls • Prioritize development engineering projects • Creation of customer service engineering group • Target re-manufacture

The following six guidelines result from the empirical findings:

1) ***Advance preparation:*** Each of the involved organizations had actual and historical information on the purchase motivations of their current customers and stakeholders. These data should be distributed ***before*** the planning session started.

2) ***Focus on the present:*** As **Marino** states, the purpose of the first phase is to identify the current competencies and capabilities of the organization. It is important to start the initial discussions with the current state.

3) ***Let the debate begin:*** The application of the respective steps should be accomplished over a series of meetings that allows a more fundamental and complete analysis. As **Marino** described, two of the cases were conduced in a single day and the debate was apparently shortened in the interest of finishing the agenda.

4) **The issue of imitation:** The management team had difficulties to conduct an efficient discussion with regard to the replication of their competitors' competencies and capabilities. **Marino** suggests some advance reading or a preliminary discussion on the barriers to imitation.

5) **Expect to compromise:** There were capabilities identified in each of the case-studies that do not have the strategic value of a core-capability. This is described as a likely compromise outcome in consensus-seeking activities.

6) **Beware of the difficulties in defining capability: D**efining capabilities was difficult for the management teams because of their different perspectives. The most recognizable form of core-capabilities describes the ability of a firm to perform some basic functional activity better than competitors. Brand management or distribution logistics (i.e. our case COMPUTEX) are examples. More examples found in the **Marino's** case-studies were "after-sale support", "speed and flexibility of design modification and development", and "management of vendors".

Another form of organizational capability has been the ability to change, innovate, or adapt over time. These sorts of capabilities are of a dynamic nature and have the potential to create new competencies and capabilities. Examples for this "higher-order" category of capability are the ability to support an entrepreneurial climate or to support a continuous improvement climate. But as **Marino** remarks (1996: 50), it is useful to keep the definition of "higher-order" capabilities as close to the actual work processes as possible.

Summarizing we may point out that a process to determine the value of resources and capabilities should be guided by objective methods providing enough room for discussion and analysis. If the process does not result in mutual understanding, there is little chance for consistency in the everyday decisions that each member of the management team will make. The process that **Marino** suggests seems to be effective, but as he told, there is room for further improve- and refinement.

3.2 A Framework Linking Intangible Resources and Capabilities to Sustainable Competitive Advantage: R. Hall

Hall [8] (1993) focuses in his research approach on the firm's strategic management process, especially the identification of such resources that may provide the firm with sustainable competitive advantage. As he corroborates other research, in general, these resource are of "intangible" knowledge-based nature. He develops his idiosyncratic definition describing "intangible" resources like:

- The intellectual property rights of patents, trademarks, copyright and registered design.
- The trade secrets, contracts and licenses, data bases, networks, etc..
- The reputation of products and company.
- The culture of the organization (e.g. ability to deal with different challenges or to adapt to changes).

According to the author, sustainable competitive advantage results from a resource/capability differential. That means that there is a difference between the firm's and the competitor's capabilities. Hall distinguishes between four types, the "***functional differential***", the "***cultural differential***", the "**positional differential**", and the "***regulatory differential***".

Sustainable competitive advantage could be achieved if the firm is able to maintain at least on of these capability differentials. **Hall** selected for his research approach successful firms in different industry sectors like motor manufacturer, baker and retailer, manufacturer of branded snack foods, bus company, manufacturer of branded outdoor clothing, supermarket retailer.

He interviewed in the first line managing directors or personnel directors, (keeping their identities strictly disclosed). **Hall's** framework was developed as a new strategic analysis technique. His objective was to identify the relative contributions of ***product attributes***, ***capabilities***, and ***intangible resources*** to sustainable competitive advantage. Within this analysis, three issues had been of **Hall**'s special interest:

- The identification of the intangible resources which are key to success,
- The ability to communicate this information throughout a management team by the use of the framework,
- The identification of the intangible resources as the first step, followed by the protection, exploitation and enhancement.

[8] HALL, R. (1993): "A Framework Linking Intagible Resources and Capabilities to Sustainable Competive Advantage", in Strategic Management Journal, Vol.14, pp.607-618.

According to **Hall**, using this analyzing technique makes it possible to identify typical profiles for organizations in different sectors. To increase the reliability of the study, he conducted a national postal survey. According to the results of case-study and national survey, the intangible resources identified with the highest potential to sustain the firm's competitive advantage were the following:

- Top five ranking in the case-studies:

1. Company reputation
2. Product reputation
3. Employee know-how
4. Perception of quality standards
5. Ability to manage change

- Top five ranking in the national survey

1. Company reputation
2. Product reputation
3. Employee know-how
4. Culture
5. Organizational networks

Additionally, the six executive managers were asked to evaluate the analysis technique on two issues:

- Did the exercise identify a new perspective for material already known?
- Did the exercise provide a useful aid to communications?

Five of them agreed.

Hall indicates also the needs for further research in this direction, carried out for example with less successful companies to see if the technique helps them to find a better way how to manage their business, due to the better insight.

3.3 Core-Capabilities and Core-Rigidities: A Paradox in Managing New Product Development: D. Leonard-Barton

Leonard-Barton's [9] investigation examines the nature of the core-capabilities of a firm. She focuses especially on their interactions with new product- and process development projects. Two new concepts about core-capabilities are analyzed in her case-study research. First, core-capabilities are traditionally treated as "clusters" of distinct technical systems, skills, and managerial systems. These dimensions of capabilities are deeply rooted in organizational values. These organizational values are an often neglected but critical additional dimension. Second, traditional core-capabilities have a "down side" that maybe an obstacle to innovation. **Leonard-Barton** describes this effect as so-called core-rigidity. Thus, manager of new product and process development projects have to deal with a paradox: how to take advantage of core capabilities without being hindered by their dysfunctional side.

As **Leonard-Barton** explains (1992:112), development projects have the potential to highlight the gap between technology, strategy, and current corporate management practice. Such projects also highlight potential new strategic directions (**Burgelman**, 1991). But, as **Leonard-Barton** points out, there is little research-based knowledge that considers the interface between the project and the organization, and the interaction between development projects and capabilities in particular. Observing core-capabilities through the lens of the project brings out one aspect of the "***part-whole***" problem of innovation management, which **Van de Ven** describes as.. ***"perhaps the most significant structural problem in managing complex organizations today..."***(1986: 598)

3.3.1 Research Methodology and Structure of Research Teams

In collaboration with **Bowen *et al***., twenty case-studies of product- and process development projects in five firms have been conducted. Four universities (Harvard, M.I.T., Standford, and Purdue University) participated in that so-called "Manufacturing Visions" project. Each research team was composed of (at least) one engineering and one management professor and one or two designated company employees. The research was organized into a matrix scheme. Each research team had primary responsibility for one company and additionally one (or more) specific research "themes" across sites and companies.

[9] LEONARD-BARTON, D. (1992): "Core Capabilities and Core Rigidities: A Paradox in Managing New Product Development", in Strategic Management Journal, Vol.13, p.111-125.

During the data collection and analysis process, both the internal company and outside researchers served as critical control on each other. On the one hand the company members prove on the generalizability of company observations from the four other cases within their own firm, on the other hand, the academic researchers prove the generalizability of findings across companies.

Data-Gathering

All of the research members used a common research protocol. The single research teams developed case histories by interviewing particular development team members from all functional groups. Each of these personal interviews lasted 1-3 hours and had been conducted at multiple sites across the U.S. Additionally, follow-up interviews had been made if necessary to ensure comparable information across all cases.

Data Analysis

The data and notes of each team member of the research group were exchanged with the help of a computer network. Additionally, common sessions were held within a certain time period to discuss the analyzed data. The teams exchanged "company-specific" as well as "theme-specific" reports first inside the team and then among all research teams. The team members "tested" the data against their own notes and observations and gave their positive/negative comments. Each team also gave "interim reports" to the host companies. According to **Leonard-Barton**, these presentations gave the opportunity to check all data for accuracy, to obtain reactions to preliminary conclusions from other members, and fill in missing data. This way, the reliability had been improved and it could be determined that observations drawn from a limited number of projects were in fact representative of common practice in the company.[10]

[10] The examples of traditional core-capabilities were provided by the companies as "consensus judgements", usually involving others operating outside team. (1992:125). Among the 20 projects only two were clearly unsuccessful. The other projects vary in the degree of success attributed to them by the companies

3.4 Interpretive Barriers to Successful Product Innovation: D. Dougherty

Dougherty[11] investigated the interactions between new products and core-competencies. She conducted unstructured interviews with interview partners from four different companies. Some respondents were directly involved in project teams, others were indirectly involved. In addition, the project teams came from various industries, and the projects had been from both kinds successful and non-successful. To increase the reliability of her case-studies, **Dougherty** complemented these interviews with archival data sources. The researcher engages in a search for "underlying patterns" in the data.

On the teleological dimension, her method could be described as focussing on the "discovery of regularities". She makes “in-depth” qualitative analysis of the experiences of product developers across all organizational departments. Her objective is to identify specific ***organizational***- and ***social*** factors that are hindering interdepartmental collaboration on new products. According to **Dougherty**, the commercial success of new products are depending on how well a product’s design links emerging technological possibilities with emerging market opportunities. This in turn requires that people from specialized departments within a firm (i.e. ***marketing, sales, R&D,*** and ***manufacturing*****)** collaborate to create these linkages. While each function could contribute with particular insights and expertise, the collaboration remains hard to manage.

Dougherty found ***two barriers*** to effective collaboration and product development. These barriers refer to ***interpretative problems***:

- First, the respective departments (i.e. sales, marketing) make their own sense of the "technology--market" linkages. These departmental "thought worlds" have different views of the product future. Moreover, they perceive the necessary task in qualitatively different ways. The resulting problem is a failure to appreciate another department’s problems and how the overall work is intertwined.

- Second, the firm’s routine procedures for product development contain rules for working together, making decisions, and evaluating products. These routines (in our case the core-capabilities /rigidities) may be the reason for another interpretive barrier, because they may not include the collaboration and creative learning necessary for product innovation. Emphasizing the status quo, the routines may reinforce the departmental separation. As **Dougherty** found out, the failed product developers followed their firm’s usual routines for product development, while the successful developers create new ones.

[11] DOUGHERTY, D. (1989): "Interpretative Barriers to Successful Product Innovation", in Working Paper Marketing Science Institute, pp.89-114.

Three Techniques to Cope with Interpretive Barriers

- The successful product developers generated an "outward—oriented" assessment of their colleagues' problems in other departments. They did not maintain that the others "thought worlds" did not exist, but tried to look beyond them. This approach is time intensive and needs incentives to invest the extra energy. The corporate management need to give their innovators the ability and time to make those connections and work together.

- The successful product developers created a "common noun", a simplified understanding of the market and product that made sense to all the "thought worlds" of the respective departments. Here team learning with real customer contacts facilitated the finding of the "common noun".

- As a third technique, the developers generated new "evaluation criteria" for the product. These evaluation criteria were formulated following the "common noun" principle.

As **Dougherty** comments, her case-studies brought out that the various departments are different. These different "thought worlds" may create real barriers to innovation. To mitigate this effect, the management need to step out of these particular groups and departments with their respective "thought worlds" and find commonalties on a "meta" level that are accepted by the entire organization. But one the other side the management should keep contact and work within the groups to coordinate people and resources. The corporate management must build the social infrastructure that facilitates such collaboration. According to **Dougherty**, this infrastructure can be created through various forms, from more "simpler" reward systems or rules, to task forces or venture teams, depending on the firm and situation. The authors conclusion is that human groups always create a social infrastructure also in the economic environment. The nowadays challenge of the corporate management is to facilitate that the groups find together and meet the specific needs of innovation.

3.5 Integration and Dynamic Capabilities: Evidence from Product Development in the Automotive- and Computer Industry: M. Iansiti, and K. B. Clark

Iansiti & Clark[12] investigate with their case-studies the impacts of external and internal integration activities on the dynamic (core) capabilities of the firm. In a similar manner than the research designs described before, the authors use product development activities as a lens focussing on the capability-building process of a firm. As a first step, they develop a conceptual model of the capability-building process that relates specific problem-solving activities to the organizational capabilities. In a second step, they derive a measurement system called "dynamic performance" measurement, that estimates the level of dynamic capabilities in an organization.

The authors formulize a series of hypotheses that link specific processes with the achievement of high dynamic performance. They highlight that the capacity to integrate diverse knowledge pools through problem solving activities is the basis of knowledge building in an organization. Such problem solving activities are therefore a critical driver of dynamic performance. The researcher are testing their hypotheses with the help of cross-sectional empirical studies of product development in the automobile- and mainframe computer industries. Additionally, they describe the impact of integration activities on the competence-building processes at Nissan and Nec with a detailed longitudinal case. As the authors argue, the notion of a firm's "distinctive competence" is well known in historical strategy formulation, but more recent research work on the resource-based view, encompassing core-competencies and the phenomena of "learning" has emphasized the dynamic nature of capabilities that are critical to sustainable firm performance (e.g. **Nelson & Winter**, 1982; **Teece**, 1982; **Wernerfelt**, 1984; **Hayes *et al***. 1988; **Prahalad & Hamel**, 1990; **Leonard-Barton**, 1992).

Former empirical studies have not focused on the complex processes that are underlying the dynamic capabilities of a firm. According to **Iansiti & Clark**, existing studies have not explicitly linked "best practice" in specific dynamic routines with the firm's competitive performance. Therefore, the authors' purpose is to deepen the understanding of the processes that are underlying the building and renewing of organizational capabilities. But as they admit, studying the dynamics of capabilities is a very complex and challenging task. Their strategy is to focus on a certain domain (i.e. development of products) within the firm. Here, the researcher may easier follow the development of new products and processes, and understand the complex capability building process. As the authors point out, the

[12] IANSITI, M. & CLARK K.B. (1994): "Integration and Dynamic Capability: Evidence from Product Development in Automobiles and Mainframe Computers", in pp. 557-605.

focus on product development in this context provides an useful window to the general capability-building process of the firm.

For the analysis of the character of dynamic capabilities under different environmental conditions, the authors investigate the product development in the automobiles- and computer industry. While the automobiles industry provides insight in the character of capabilities that may serve changing customer demands, the computer industry allows to observe the process of capability development under uncertain and changing technologies.

Iansiti & Clark emphasize the importance of "knowledge" as the foundation of a capability and the "problem-solving process" as the primary driver for the generation of new capability. Moreover, they argue that the firm's capacity for integration across functional lines is the fundament for effective problem solving. The ability of integration provides the basis for any new capability building process. The researcher found strong empirical support for the link between integration capability and the sustained performance of the organization. The authors go align with **Leonard-Barton** who identifies "employee skills", "technical systems", "managerial systems", and "values and norms" as the critical systems dimensions of the "interrelated, interdependent knowledge system" that creates the capability base of the organization (1992: 8).

The framework highlights the relationship between a ***knowledge base*** and a ***capability*** at a point in time. They assess the issue of "problem solving" as the basic unit of new knowledge creation. For their framework they are using a "Simon-type" model in which a **gap** between actual and desired performance triggers a cycle in which the team considers the problem, deliberate alternative solutions, and conduct tests on models. The authors understand their conceptualization of dynamic capability as an evolution of the outlook of **Leonard-Barton** (1992), **Dosi and Marengo** (1993), and **Teece *et al***. (1992).[13]

Iansiti & Clark relate their construct of dynamic capabilities to the consistency or consistent ability in a firm's response to environmental changes. This consistency enables the firm to sustain its competitive advantage. Under these terms, the researcher formulate the following propositions:

I) An organization's dynamic performance in a changing environment may be measured in two ways:

- by its consistent ability to perform positively across projects in multiple lines
- by its consistent ability to sustain positive improvement in its performance over time

[13] Teece *et al*.(1992): "***Dynamic capability links capacity for action to the evolution of the associated knowledge base through the effective execution of problem-solving processes".***

II) The dynamic performance of the organization will be associated with it's capacity for ***external integration***. (This proposition focuses on the processes of concept development, in particular on the ability to generate opportunities by using external information sources.)

III) Skills in ***internal integration*** will result in effective implementation processes. (I.e. the capacity for coordination that enables efficient communication between organizational departments and sub-units.)

Empirical Methodology

As already mentioned, the case-studies were conducted in two environments, the automobiles- and the computer industry. The two economic environments had different characters. At the time of the field study, the automobile industry's applied technology was relatively stable. But, it's market environment was unstable, due to changing customer preferences (see also **Clark & Fujimoto**, 1991). On the other hand, the mainframe computer industry had a more predictable customer base (stable preferences due to software compatibility standards). But, the computer technology was fast changing and companies were constantly forced to improve their technological competencies.

Combining the results of the two studies allowed **Iansiti & Clark** to assess the impact of integration capability in various environments. The automobile industry (high market uncertainty) seemed to be appropriate for the study of the impact of ***customer integration capability*** on firm performance , while the computer industry (ambiguous technology) seemed to be appropriate for the study of the impact of ***technology integration capability*** on the organization's performance.[14]

The computer industry case-study investigated 27 product development projects between 1989 and 1992. The overall objective was to compare the approaches taken by the respective development teams to solve a well defined set of technical problems. To obtain comparable empirical results, the researcher restricted their focus on the development of a specific computer subsystem, the "multi-chip module". This module integrates individual ICs (integrated circuits) to build up the processor of a high performance computer.

As **Iansiti** (1992b) describes, the "multi-chip module" is a complex system, however, its technical performance is well defined and measurable using a small number of variables. This allowed the researcher the analytical comparison of development efforts in the various organizations.

[14] The internal integration capability ought to have a similar impact on both economic environments.

Iansiti & Clark collected data on crucial projects over the past ten years. Additionally, in each company, one ore more projects were analyzed in detail. Structured and unstructured interviews were made with project engineers and managers at different hierarchical levels who had been involved in the project's most critical aspects. **Iansiti & Clark** recorded the histories of each development action by tracking completion dates of each major step as well as the resources used. They also described the basic characteristics of the organizations with its management systems. Furthermore, by discussing specific problem-solving situations, they analyzed examples of individual approaches to technical choice and problem solving. For this purpose, sequential projects were analyzed (with the help of questionnaires) to study the evolution of products and firm capabilities over several generations.

Regarding the performance in the automobile industry, the results show that organizations that exhibit high dynamic performance in product development (high quality, high productivity and short lead times), are characterized by a high level of internal and customer integration. On the other hand, the dynamic performance of the computer industry was measured by evaluating the ranking in technical performance improvement between 1980 and 1990. To measure the simultaneous achievement of "high project-level speed", "productivity" and "rate of technical improvement", **Iansiti & Clark** constructed an indicator based on the sum of "productivity", "development lead time" and "performance improvement" rankings.

The firms could be sorted into two major groups. Those with ***above***, and those with ***below*** average technology integration capability. **Iansiti** & **Clark** defined firms with above average values as being "system focused". Those with below average values as being "element focused" (**Iansiti**: 1992a). This typology was independent from national origins. The researcher found examples of US, European and Japanese firms in both groups. It could be derived from the analysis that "system focused" firms achieved higher levels of "technical improvement", "productivity" and "speed". Such organizations maintaining a high level of integration capability consistently ranked higher in dynamic performance in both economic environments. Customer integration capability was a crucial strength in the turbulent market of the automobile industry, while the technology integration capability appeared critical in the computer industry. Internal integration capability was found important in both environments.

The empirical findings highlight that the best and most consistent performers in each industry (from the perspective of product quality, productivity and lead time) are characterized by high levels of external, internal technology integration capability. They react to their ambiguous environment by continually integrating new competence within their capability base. As **Iansiti** & **Clark** highlight, additional empirical work is necessary to confirm this general conjecture, and to explore the detailed mechanisms by which integration may affect other aspects of the firm.

3.6 Developing an Intrapreneurial Assessment Instrument for an Effective Corporate Entrepreneurial Environment: D. Kuratko, R. Montagno, and J. Hornsby

Kuratko *et al*.[15] state preliminary in their research report that the implementation of corporate entrepreneurship or intrapreneurship is becoming an important activity for growth-oriented business. However, very little empirical research exists that analyzes the effectiveness of a strategic context for the implementation of intrapreneurial strategies. To help in closing this gap, the researcher develop the intrapreneurship assessment instrument (IAI) that measures the various dimensions and the degree of the intrapreneurship culture already existing in the firm. In their case-studies, they are using this instrument to assess the effectiveness of an ongoing intrapreneurship program in a Fortune 500 company. As the authors argue, organizations need some guidelines how to develop effective intrapreneurial strategies. But the identification /determination of the various dimensions/factors of intrapreneurship is a very complex task. For this purpose the authors are engaged in verifying the existence of a "generalized set" of strategic context /conditions that can facilitate intrapreneurial activities.

As the authors explain, a number of factors such as management support, incentives, organizational structure, resources, and risk taking, are needed to develop an intrapreneurial environment. **Kuratko** *et al.* found empirical evidence that a certain strategic context in fact influences entrepreneurial behavior. While the literature on intrapreneurship highlights a broad range of intrapreneurial factors, there are a few elements that are consistent like:

- The appropriate use of a reward system. This should include goals, feedback, emphasis on individual responsibility, and rewards based on results,
- The management support with regard to the motivation of managers to facilitate entrepreneurial projects.
- The resources (which includes time) and their availability. Employees must perceive the availability of resources for innovative activities.
- The organizational structure as consistent element.
- The risk taking attitude: Employees and management must have a motivation to take risk and have a tolerance for failure should they occur.

As **Kuratko** *et al*. note, several case-studies, surveys and anecdotal evidence have been made with regard to the existence of a specific "set of conditions" which support an intrapreneurial environment. But more "rigor" is needed in actually establishing the validity of the ideas present in the literature. According to the authors, the beginning step in any research of this type would be to design an in-

strument that can measure the degrees of the various dimensions building the strategic intrapreneurship context.

Based on an analysis of the most consistent elements in the literature, the researcher created (hypothesized) a multidimensional scale consisting of five factors to summarize the major subdimensions of the concept of intrapreneurship. Subsumed under each of these factors they defined various procedures and policies that may exist in an organizational setting.

Research Method

The case-study was set up as quasi-experimental design in a Fortune 500 firm. The study had two major objectives:

a) The examination of the factor structure/ dimensions of the firm's intrapreneurial context and the proof of the reliability of the intrapreneurial assessment instrument (IAI).
b) The investigation of the utility of this IAI by applying it for the assessment of the "degree of change" in the firm's corporate culture. This change should be a result of a training program intended to introduce intrapreneurial concepts

Data for both, the factor analysis and the assessment of training effectiveness (demonstrating the utility of the IAI) were collected from 111 low-to mid-level managers of the associated group. This group is standing for a class of firms that recently moved into an environment that is less regulated and more ambiguous. The new economic situation puts more pressure on the firm to develop innovative products and services.

The subjects in the sample were the subordinates of 25 senior-level managers who participated in an intrapreneurial training program (ITP) conducted by two of the authors. The sample was obtained by asking each of the 25 managers to identify five subordinates from whom data could be collected. The responding subordinates worked within the firm at an average of 10 years. A separate sample of 23 managers similar to those used in the experimental sample was utilized to assess the "test-retest" reliability of the instrument. The separate sample was obtained from managers who did not participate in the ITP.

[15] KURATKO, D.& MONTAGNO, R.& HORNSBY, J. (1990): "Developing an Intrapreneurial Assessment Instrument for an Effective Corporate Entrepreneurial Environment", in Strategic Management Journal, Vol. 11, pp.49-58.

The Validation of the Intrapreneurial Assessment Instrument (IAI)

The IAI was first sent to the manager trainees who participated in a training program[16] which was conducted over the six following weeks. During the forth session the manager trainees were asked to forward the IAI also to their subordinates for completion. Each manager trainee identified at least five subordinates (average potential) whom they closely supervised. The IAI was delivered via company mail with the assistance of human resource manager in the organization. After 2 weeks a follow-up survey was sent to anyone who had not responded. Four month after sending the first survey, the "post-measure" was taken. The procedure used was basically the same as for the "pre-measure". Here, the initial survey was distributed by the company through interoffice mails, and the follow-ups were handled by the researcher personally.

The intrapreneurial assessment instrument (IAI) was developed to identify the dimensional structure of organizations with respect to their ability to build the strategic context for intrapreneurship. Initially, 28 items were constructed around five factors. The existence of these five factors was determined on the basis of a review of the existing literature on intrapreneurship, corporate entrepreneurship, and innovation in corporation. According to **Kuratko** *et al*., it appeared that although there were a number of different names given to those factors by various writers in the field, the most consistent factors seemed to fall into five distinct categories:

-Management support for intrapreneurship
-Organizational structure
-Risk-taking
-Time availability
-Reward and resource availability

The first results of the factor analysis suggested a three-factor design instead of the hypothesized five factors. The resulting factors were "management support for intrapreneurship" (nine items), "organizational structure" (six items), and "resource availability" (six items). Essentially, the hypothesized time availability factor was integrated into rewards and resource availability and the hypothesized risk-taking factor was integrated into the top management support factor. The item analysis of the three scales revealed that the scales were highly reliable given the number of items in each scale. The items were formatted on a five-point scale asking subjects to indicate the degree to which the item described the atmosphere in their immediate workplace.

[16] The training program was intended to create an awareness of intrapreneurial opportunities in the organization. The program consisted of six 4-hour modules, each designed to move participants to the point of being able to support intrapreneurship in their own work areas. The program was designed based on a review of the literature in intrapreneuring, and thus represents an attempt to operationalize the factors discussed in the literature review.

Factors/Dimensions of the Intrapreneurship Assessment Instrument

Scale1: ***Management Support for Inrapreneurship***

1. Management encouragement for activities
2. Decision-making power
3. Senior managers encourage bending rules
4. Top management experience with innovation
5. Top management sponsorship
6. Individual risk-takers are often recognized whether eventually successful or not
7. Encouragement for calculated risks
8. "Risk-taker" is considered a positive attribute
9. Small and experimental projects are supported

Scale 2: ***Organizational structure***

1. Second chances after mistakes
2. Mistakes as learning experiences
3. Important to look busy
4. Difficult to form teams
5. Concerns for job descriptions
6. Defining turf is important

Scale 3: ***Reward and research availability***

1. Availability of funds
2. Lack of funding
3. Problems with company budget process
4. Additional rewards/compensation
5. Options for financial support
6. Problem solving time with co-workers

Conclusions

The authors engaged in organizing the large body of theory & research on corporate entrepreneurship. The result of their research demonstrate empirical support for the existence of an underlying set of "environmental factors" that need to be recognized by the corporate management if they plan to introduce intrapreneurial concepts in their firms. The three dimensions that were identified and tested (management support for intrapreneurship, organizational structure, and resource availability) are

seen as the first step to provide a valid description of the conditions needed to foster entreprenurial activity within corporations.

Kuratko *et al*. suggest that if intrapreneurship is planned in an organization, then certain, but not all, aspects of an organization's climate must be addressed. Obviously, their study does not statistically confirm this assertion, but it does support the notion that there are a set of dimensions, identified initially from applied writings, that are relatively reliable and stable. From an applications perspective this can give direction to the corporate management of organization which might be considering trying to develop a more intrapreneurial climate. The second part of the study, the construction of the IAI has additional implications. The instrument can be used as a diagnostic tool for determining the areas where changes may be needed if an organization is considering introducing intrapreneurship.

The research seeks also to confirm that intrapreneurship training may be effective in changing the individual employees perception of his/her work environment. As the researcher note, more research is needed to refine both the concept of intrapreneuring and the environment which fosters it. This research seems to provide a basis for beginning the process.

3.7 Intrapreneurship in Small Business: An Exploratory Study: C. Carrier

As **Carrier**[17] note, in general, all entrepreneurial activities necessarily end when the venture creation stage is complete. But, to remain competitive in today's markets, a firm must constantly innovate. The author focuses on the influence of intrapreneurship as an impetus for continuous development and innovation in organizations. **Carrier** defines "intrapreneurship" as: ***"..the introduction and implementation of a significant innovation for the firm by one or more employees working within an established organization***". According to the author, the definition of innovation should be extended including also commercial, organizational, institutional, procedural, and social issues. As the author points out, most research of intrapreneusrhip considers this phenomenon within the context of large organizations, but it is essential for smaller organizations as well. For this reason, the researcher formulates six postulates that help to reconsider and align the concepts of intrapreneurship and small business:

- **Intrapreneurial characteristics are not the exclusive property of employees of large firms.**
- **Intrapreneurs can be "first-class allies" for owner-managers of growing small businesses.**
- **The fact that intrapreneurs are absent from the small business literature does not mean that they have not the right to be there.**
- **The loss of an intrapreneur will have more serious consequences for small firms than for large firms.**
- **Small firms are potential incubators for intrapreneurs**
- **Small business provides a favorable environment for innovation.**

As **Carrier** describes, a review of the literature on intrapreneurship reveals two main research trends. The ***first*** of these trends is concerned with the individuals who innovate in the firms that employ them. The researchers of this trend focus on the one hand on psychological characteristics and personal attributes of the intrapreneur, on the other hand they focus on the role and functions of intrapreneurs presenting them as "change agents" or "visionaries". The ***second*** trend in entrepreneurship literature refers to the intrapreneurial process itself, the factors that lead to to its emergence, and the required strategic context. The second trend sees intrapreneurship as "organizational mode" allowing employees to innovate. Intrapreneurship is viewed as managerial strategy supporting entrepreneurial behavior among employees.

For **Carrier**, following the second trend, it is relevant to examine the factors governing the emergence of interpreneurship in small businesses, and the context and strategic process underlying its development. The author use the methodology of exploratory research. The research was carried out as in-

[17] CARRIER, C. (1991): "Inrapreneurship et PME", in Gestion, Revue internationale de gestion, 16(4), Nov. pp.20-27.

depth study of the emergence and implementation of five intrapreneurial projects in small firms in Québec. The study revealed the personal "representations" of the respective intrapreneurs and owner-managers with regard to the entrepreneurial experience they made during their everyday organizational life. For this research purpose, **Carrier** used a so-called content analysis[18] of the representations and identified several elements like:

- the factors that lead to the emergence of projects,
- the motivators, and
- the strategic processes.

3.7.1 Methodology and Research Focus

As **Carrier** explains, the 5 enterprises selected for the sample were recruited on a voluntary basis. In-depth interviews were carried out with five owner-managers and five intrapreneurs. The researcher held with each of the 10 interview partners two or three meetings of between two and three hours.

The interview partners were asked to describe their personal representations of:

- the form of intrapreneurial cooperation
- the factors leading to the emergence of the intrapreneurial project
- their personal motivations for becoming involved and
- the positive and negative consequences of the experience.

The in-depth interviews were carried out always the same way, recorded and transcribed. After the transcription, the researcher held individual control and feedback meetings with the interview partners to reflect on their statements. As **Carrier** describes, the research was carried out with the help of a basically interpretative approach. The interviews were designed as non-directive, to enable the interview partners to describe or so to speak to construct their own representations. The research is structured according the following research issues:

- ***contextual variables*** in the intrapreneurial projects studied
- ***comparative analysis of the factors*** governing the emergence of intrapreneurship as perceived by the owner-managers
- ***personal motivation*** of intrapreneurs
- ***strategic processes*** involved

[18] According to BARDIN (1989), content analysis has two possible functions. Its function is said to be heuristic when the analysis enriches exploration and increase the propensity for discovery. On the other hand, its function is to "administer proof" when systematic analysis is performed to confirm or invalidate one or more hypothesis.

3.7.2 Contextual Variables in the Intrapreneurial Projects studied

The first point in the research was the focus on the different types of innovation. Here, the researcher found a broad spectrum from typical innovations like the development of new products but also the introduction of a new organizational method. In each case, the type of innovation proposed was likely to have a positive effect on the firm's growth strategy. That way, as all owner-manager stated in the interviews, all innovations reinforced the firm's strategic factor and competitive advantage.

Table 3.2: ***Contextual Variables in the Intrapreneurial Projects***

	Number of employees	Activity sector	Type of innovation	Business ideology	Determinent strategic factor
Firm 1	70	Manufacturer (bicycles)	New organizational method (spinoffs)	Focused on growth	Differentiation through product quality
Firm 2	100	Manufacturer (high technology)	New technology	Focused on growth	Constant innovation
Etc.	.....	.....	.....	.....	.....

As **Carrier** notes, all the owner-managers maintained that their organizations growth was made easier by the cooperation with people with intrapreneurial traits.[19]

3.7.3 Comparative Analysis of the Factors Governing the Emergence of Intrapreneurship (as perceived by the Owner-Managers)

- Factors inherent in the organizational context or in the manager's personal style, like the ability of the owner-manager to trust employees and to delegate tasks, or the right of employees to make mistakes.
- Factors inherent in the personal motivators of owner-managers (motivating factors) like:
- Motivators related to the demands and constraints of the external environment (especially the competition)
- Motivators related to the perception of an individual as an intrapreneur and that individual's availability.
- Motivators related to the firm's growth objectives
- Motivators related to the management or production problems encountered in the internal environment.

[19] The companies in the study were not selected on the basis of their desire for growth.

As **Carrier** explains, in most cases, owner-managers are more motivated to encourage intrapreneurship if they think their support includes people with the ability to play an active role. The next table highlights the motivators for innovation as perceived by the intrapreneurs. As she describes, personal motivation is to a great extend dependent on "individual personality", "characteristics", and "personal situation", encompassing also factors like "personal temperament", "past experience" and "personal career objectives", moreover, existing or future rewards that have value in the eyes of the potential intrapreneurs.

3.7.4 The Personal Motivations (as perceived by the Intrapreneurs)

Table 3.3: ***The Personal Motivations of Intrapreneurs***

Intrinsic personality-related motivations	• Intrapreneurial personality eager for challenge and achievement • A sense of working for oneself first and foremost • Interest in discovering "better" ways of doing things, etc.
Extrinsic, reward-related motivations	• Promotion • Access to capital stock • Innovation bonus, etc.
Motivations related to past experience and future career objectives	• Desire to work for oneself • Past experience as an entrepreneur /intrapreneur
Motivations related to the organizational context	• Management style that welcomes intrapreneurship • Sense of belonging /mutual confidence • Shared vision with the entrepreneur, etc.

As **Carrier** notes, as an interesting point, for small business intrapreneurs (different to large company intrapreneurs), promotion is clearly a significant reward, because it enables the intrapreneur to be nearer the owner-manager as final decision maker. Small business intrapreneurs seem to assume that if they are promoted, they will be able to take more initiatives in different areas. As the author found out, small firm intrapreneurs will tend to leave if their expectations are not met, and thus becoming competitors of their former firms. This happens often in sectors, where the entry barriers are not so high. As the researcher concludes, a supporting context for intrapreneurship should combine the motivators to lead on the one hand more managers to encourage intrapreneurship and motivate on the other hand more employees to engage themselves in intrapreneurship activities.

Strategic Processes support Intrapreneurship

With regard to the occurrence of intrapreneurship, **Carrier** is interested in how intrapreneurial cooperation is developing. Is intrapreneurship explicitly planned by the owner-manager or, when it occurs, does it influence the further organizational planning of the owner-manager? There are also cases where intrapreneurship occurs without any support. Following **Mintzberg**'s argumentation, intrapreneurship might be both a "deliberate" and an "emerging" strategy, depending on the circumstances. Carrier's case-studies revealed three separate divisions in the strategic process:

- the ***type of strategy*** adopted by the owner-manager,
- the owner-manager's overall ***strategic profile*** based on **Miles & Snow's** (1978) typology,
- the type of ***strategic behavior*** adopted by the intrapreneur based on **Burgelman**[20] & **Sayles** (1987)

A comparative analysis of the sample revealed separate types of strategic process:

- intrapreneurship may be a direct consequence of a deliberate, active strategy on the part of the owner-manager
- the owner-manager's strategy may emerge as a result of the process of reflection triggered by intrapreneurial behavior(s) within the firm, and then develop incrementally
- intrapreneurship may emerge with no explicit or tacit strategy on the part of the owner-manager, and without generating a positive or prospective process of reflection

As **Carrier** describes, in most cases of the study, the presence of an intrapreneur was acting as a trigger for the owner-manager's strategic process. Following this argumentation, the strategy does not create the intrapreneur, but is reactive and aimed at incorporating intrapreneurial energies positively. **Carrier** describes that kind of strategy more as "contingent" rather than "deterministic".

Table 3.4: ***Strategic Processes support Intrapreneurship***

	Type of strategy by owner-manager	Owner-manager's overall strategic profile	Intrapreneur's strategic behavioral profile
Firm 1	Deliberate and active	Defender	Induced
Firm 2	Emergent and incremental	Prospector	Autonomous
Firm 3	.....	.....	.....

[20] Intrapreneurship as consequence of two different behavioral logic.

Referring to column 3, the intrapreneur's strategic behavioral profile is a direct result of the owner-manager's strategy, whether deliberate /active or emergent.

The typology above is based on 3 premises:

- A company that succeeds systematically develops, throughout its experience and life cycle, an identifiable approach that enables it to adapt to its environment.
- There are four possible strategic orientations: defending, prospecting, analyzing, and reacting
- The first three can lead to success if they are properly implemented

Carrier found in her sample only two strategic orientations (prospector; defender), explaining this by the small size of the sample. As she notes, it might look strange to find defender-type strategy within intrapreneurship and innovation. But she argues that defender owner-manager seek mainly the type of innovation that will continuously improve their performance in current markets and with current products.[21]

3.7.5 Conclusion

As the author describe, the research shows that the structural and relational aspects (between owner-manager and intrapreneur) are the crucial factors in building an intrapreneurial context. All the factors listed above are important, but none on its own is sufficient for the emergence of intrapreneurship. As **Carrier** notes, the factors interact and influence each other through a dynamic chain of causality. Therefore, she recommends that intrapreneurship should in further research designs being approached with the help of an "interactionistic" methodology.

In general, owner-managers are willing to support intrapreneurship if they think it will help the company to be more productive, more flexible or better-adapted to its environment (enterprise fulfillment). On the other hand, the intrapreneurs motivation seem to be much more subjective (personal fulfillment). **Carrier** highlights the importance of future research of developing more appropriate remuneration and reward systems to motivate the contribution of intrapreneurs in small business. **Carrier** points out that the research on intrapreneurship in small business has his own aspects and characteristics and cannot be based only on the intrapreneurial theories developed in the context of large enterprises. The strategic processes involved are contingency-based rather than deterministic, and as the author notes, further approaches are necessary to help owner-managers to deal with the inherent potential intrapreneurial dynamics in their firm.

[21] Contrary to prospector owner-managers, who seek to broaden their poduct range and their markets

The author see it therefore as difficult to generalize the results. But, as **Carrier** notes, it was not the aim to generalize, but to study a phenomenon on a case-by-case basis, which each case providing a better understanding of the others. As a second limitation, the researcher see that the statements of the interview partner possibly have been influenced by the researcher and their research goal (see distortion effects in interviews) and cannot therefore be considered to be neutral.

Table 3.5: ***Factors affecting the Level of Intrapreneurship in Small Business***

Intrapreneur:	**Enterprise**:	
• Personal profile and attitude • Motivations • Expected rewards	• Structure • Culture • Management practice • Presence of rewards for potential intrapreneurs	• Perception of external environment • Strategic objectives • Motivations • Open attitude by owner manager

Degree (+ or -) of Intrapreneurship

3.8 Upper Management Control of New Product Development Projects and Project Performance: J. Bonner, R. Ruekert, and O. Walker

Bonner *et al.* **(2002)** investigate in their study "formal" and "interactive" control mechanisms that corporate managers use, and the resulting effects on new product development projects (NPD). As the authors argue, "***a fundamental issue facing managers is how to exercise adequate control over NPD project teams that by their nature require some degree of flexibility, creative freedom and participative decision processes. While some degree of freedom and flexibility seems to be an essential ingredient to the relative speed and success of cross-functional NPD teams, it is not without risk***" (2002: 234).

If teams are without control, they may follow project alternatives that exceed the firm's resources, running behind schedule or over budget. Until the corporate management is aware of this, it may go on for a long time. But, on the other hand, too much control may have a negative effect on the teams creativity and hindering their activities. Here, the key question is, how do different levels and types of formal control impact project team performance.

Bonner *et al*. are relying in the first line on quantitative methodologies, but complementing them with qualitative problem-focused interviews made with product development professionals. Their research is of our interest not in the first line because of the methodology, but, because of the research themes.

The authors formulize a question catalogue encompassing the following research issues:

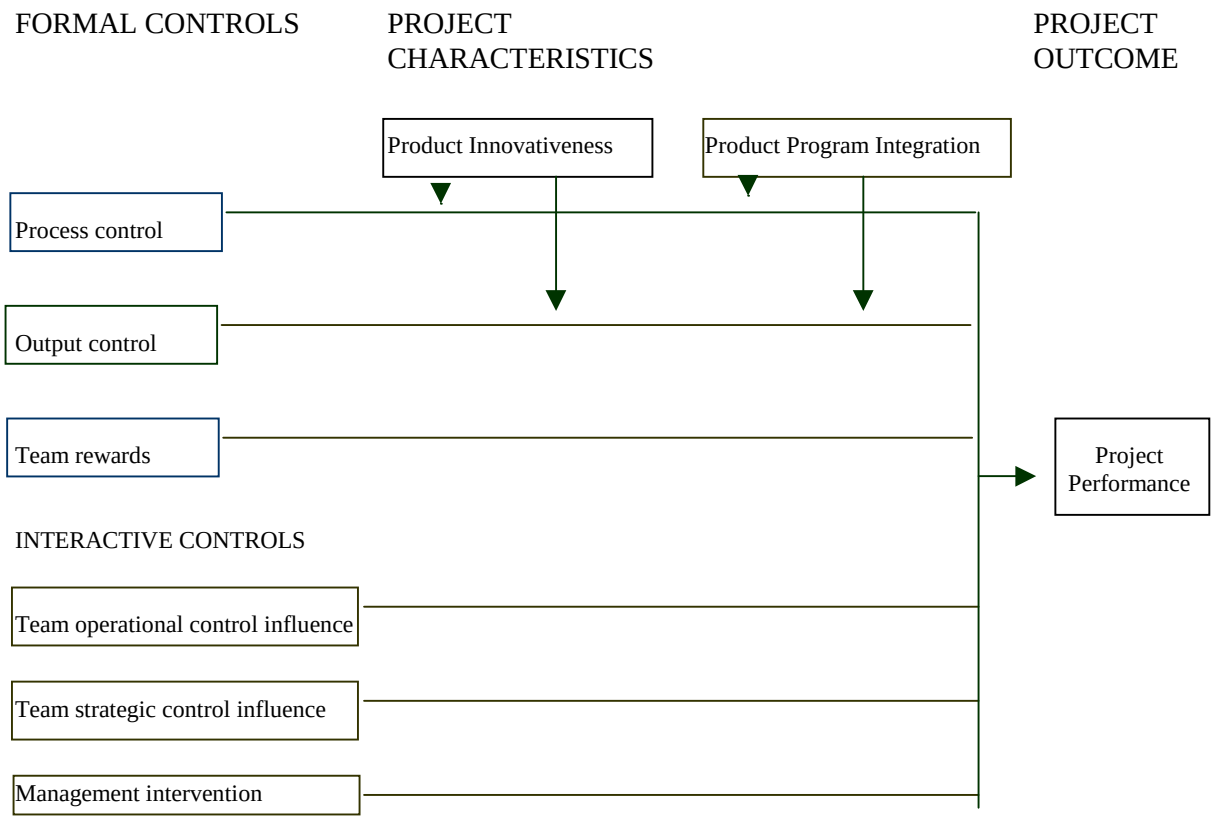
- The relationship between managers' use of different formal mechanisms for controlling a NPD project (process, output, and team-based rewards) and project performance?
- Do characteristics of the project itself (innovativeness/ congruent /incongruent with product line card) moderate the relationships between formal control mechanisms and project performance?
- Does the empowerment of team members to participate in defining the strategic and operational parameters of the project have any effect on the overall team's project performance?
- What effects do interventions by higher-level managers during the course of a NPD project have on project performance?
- Which kind of rewards improves best the NPD performance (individual versus team-based).

The following control mechanisms have been chosen in this study:

- "Formal output controls" (i.e. goals, schedules, budget, etc.).
- "Process controls" (i.e. processes and procedure).

Bonner *et al*. examine also the influence of the "interactive" control mechanism on project performance. These tools are used by corporate managers to personally involve themselves in the decision-making process of their teams. The interactive controls provide corporate management with a more dynamic and responsive control system in comparison with traditional diagnostic controls. An important advantage of the interactive control system is the fact that the imposed control criteria can be changed and "adjusted" during the project. Here, the corporate management might change the original goals of the project or may even reject team decisions. As the authors remark, while such interventions may be justified by shifts in the markets, they might be dysfunctional by replacing team consensus-building with management directives and thus may destroy team motivation and commitment. But interactive controls have not only negative effects. For example, by accompanying the structuring of projects into cross-functional teams, corporate managers are seen as playing a crucial role in instituting effective control mechanisms. These mechanisms are seen as tool to keep project development teams "on track" to avoid unpredictable outcomes. Among several forms of interactive control processes, **Bonner** *et al*. examine three types: team operational influence, team strategic control influence, and management intervention.

Figure 3.1: ***The Conceptual Model***



In BONNER et al (2002): "Upper Management Control of New Product Development Projects and Project Performance", in The Journal of Product Innovation Management, Vol.19, p.236

According to **Bonner** *et al*., six types of ***control mechanisms*** are seen as being particularly important for managing NPD projects: ***process, output, team-based rewards, team strategic control influence, team operational control influence*** and ***management intervention***. Drawing on the existing product development and management control literature, the authors construct a conceptual framework developing testable hypotheses by suggesting relationships among the different variables shown in the table above. In this framework, project performance is defined as an overall measure of performance consisting of the following items:

- the degree to which the project was completed on schedule
- the degree to which the project was completed on schedule
- the degree to which it adhered to the budget
- the degree of overall team performance

Analysis and Hypotheses

Direct effects of controls on project performance:

H1: The degree of formal process control imposed upon a NPD project is negatively related to project performance.
H2: The degree of formal output control imposed upon a NPD project is positively related to project performance.
H3: The degree of reliance on team-based rewards is positively related to project performance.

According to the researcher, several conceptual models argue that rewards tied to overall team performance may encourage cross-functional cooperation, and can improve the coordination of goal-oriented activities and reduce the potential within work groups. Furthermore, a survey of product development activities found that team-based rewards help motivate entrepreneurial and risk taking behavior within new product development teams. Therefore, for ***Bonner*** *et al*. it seems likely that reward systems that prefer common group outcomes should be positively related to a NPD team's performance.

Team operational and strategic control influence:
As the authors argue, active participation in setting "formal control" parameters may increase team members' ownership and motivational commitment to meeting those commonly defined standards.
H4: The degree of team operational control influence is positively related to project performance.

Also in the case of the project's strategic direction, it should have a positive influence on the project performance, if the team is participating in the formulation. For example, experienced employees

(non-managers) may give valuable input in identifying attractive projects in a new product development program.

H5: The degree of team strategic control influence is positively related to project performance.

Management intervention:

Managers may influence a project in order to sooner resolve differences of opinion within the team. Here, there are existing well-established conceptual arguments and some empirical evidence that such acting may have a negative impact on team creativeness, project completion time, and on the ultimate quality and market success.

H6: The degree of management intervention over the course of a NPD project is negatively related to project performance.

Moderating effects of product newness and integrated programs:

- ***Product innovativeness***

  As **Bonner** *et al*. describe, NPD projects may vary in their degree of innovativeness/newness from the perspective of the developing firm. In general, the majority of initiated projects involve continuous improvements, but sometimes they have highly innovative character. In the latter case, when there is no existing past experience, the project success is even more dependent on the team's creativity and cross functional integration capability that should not be hindered by too many prescriptions. According to **Bonner** *et al*., recent studies indicate that the use of relatively autonomous, self-directed NPD teams is positively related with faster completion times, lower budget overrun, better product quality, and achievement of sales objectives on innovative NPD projects.

  For highly innovative projects it proves to be difficult to specify realistic a priori outcome goals. Thus, the extensive use of process control in innovative projects will result in lower performing projects as compared to incremental ones. But this is not the case for more standardized congruent projects where formal process controls are more appropriate because "means-ends" relationships are stable and well-known.

  H7: The more innovative a NPD project, the more negative the relationship between the degree of formal process control imposed and project performance.

  H8: The more innovative a NPD project, the less positive the relationship between the degree of formal output control imposed and project performance.

- ***Product program integration***

  When a NPD project develops a product that will be integrated into a larger product program, the project team can benefit from using formal mechanisms (process and output control) facilitating coordination of activities within the program, and making processes and standards explicit to the project team. But it is also argued that the use of these formal process and output controls for independent, standalone projects may decrease the performance level.

  H9: The more integrated a NPD project is within a larger program, the less negative the relationship between the degree of formal process control imposed and project performance.

  H10: The more integrated a NPD project is within a larger program, the more positive the relationship between the degree of formal output control imposed and project performance.

Methodology

The hypotheses above were analyzed with a mix of quantitative and qualitative empirical data from a survey of product development professionals, and complementary open-ended interviews. The focus was on people who were participating on product development teams, like product manager, project manager, marketing manager, or product development manager. 411 questionnaires were mailed to a random sample of addresses from the American Marketing Association's member list. The respondents were asked to identify and provide information about a recently completed product development project. Within the selected project, the market introduction of the new product /service should have happened within the past six to twelve months. The projects in the final sample represented a range of firms and business units of different sizes.

In a second step, to strengthen the internal validity, open-ended questions were added to get deeper information of the respondents' point of view about the nature of management interventions in their projects. From 25 projects that were evaluated above the median on project performance, 16 respondents were selected to provide open-ended comments. Analyzing the comments of these 16 interview partners, a research committee (two independent judges) concluded that only one of those 16 respondents clearly stated that managers intervened in response to diagnostic signals of poor performance.

On the other hand, 11 of the 16 responses were indicating that interventions caused or contributed to performance problems on the project. The content of the remaining four responses could not be categorized definitively. But, the cross-sectional nature of the data makes causal inferences problematic. It is suggested that in future studies researchers consider a more longitudinal perspective to deal with the temporal issue, and to consider different informants to report on process and performance characteristics. For this reasons, the authors avoided making causal inferences and have been cautious in offering managerial prescriptions.

The study's findings

Support was found:

For H1: The degree of process control imposed upon a NPD project is negatively related to project outcomes.

For H4: The amount of influence a NPD team has in shaping the operational controls to be applied to the project is positively related to project performance.

For H9, for the interaction between program integration and process control on project performance. Heavy usage on formal process control is associated with lower project performance for standalone projects. But, no significant relationship was found for highly integrated projects.

No support was found:

For H2: It could not be found that the degree of output control is positively related to project performance.

For H3: It could not be found that especially team-rewards in contrast to individual rewards have a positive influence on project performance.

For H5: There was no relationship between the amount of influence the team has over the project's strategic direction and project performance.

For H7: It could not be found that project innovativeness moderates the relationship between process control and project performance.

For H8: It could not be found that project innovativeness moderates the relationship between output control, and project performance.

For H10: It could not be found that program integration had a moderating influence on the **output control⇔ project performance** relationship.

Discussion

Formal Control Influences

Bonner *et al*. derive from their findings that on the one hand NPD teams need strategic direction (objectives, procedures), but on the other hand, such inducement of formal control mechanisms should be very sensitive as it can have also negative influence on project performance. The authors conclude that teams should determine their own ***process*** and ***procedural controls*** (within a broader framework). The study found this for both, for congruent projects as well as for more innovative projects. The researcher found that the negative association between process control and project performance was stronger for isolated projects than for integrated projects.

The study found no significant relationship between the use of ***output controls*** and project performance. This stands in contrast to the strategic literature suggesting explicit objectives to be developed and introduced in the very earliest period of a NPD project in order to provide a sense of direction and challenge to the team. Here, the authors ask for further detailed research of the various kinds of the output control variables. With regard to H3, contrary to the a priori expectations, there is no special effect on performance if the team members are rewarded individually, or as a team. But as the authors explain, that this may be further proven with variables that were not included in this research design and thus asks for further studies in this direction.

Interactive Control Process Influences

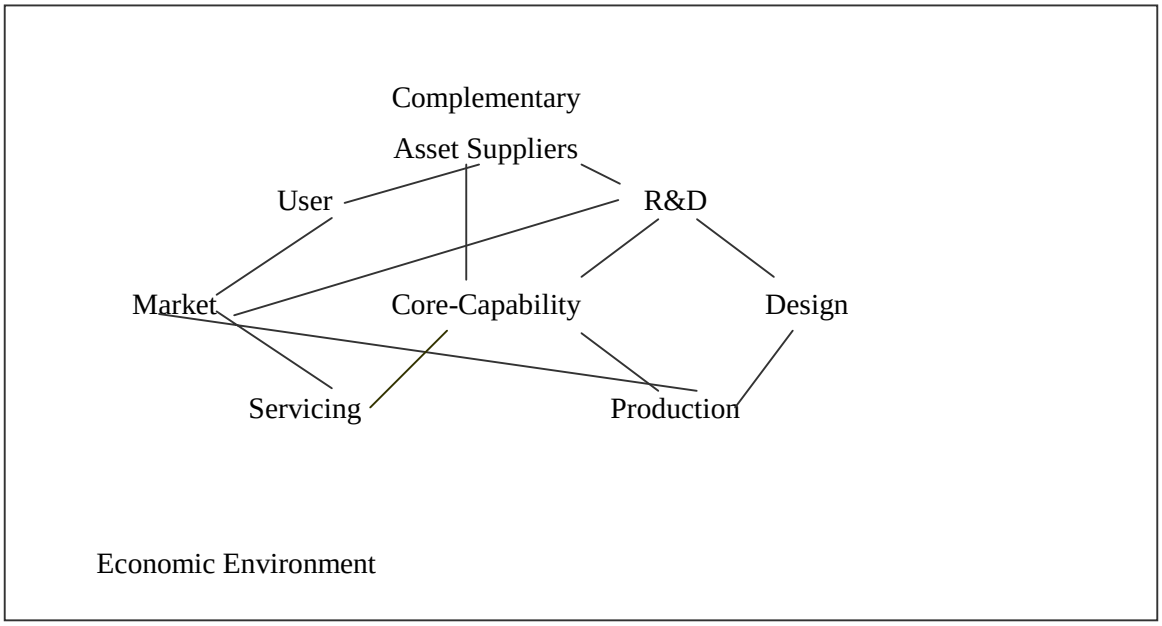
The authors found explanations, how interactive control should be induced in NPD. According to the traditional view of participative management, all kind of involvement is seen as beneficial for the firm. But, the current study found that the type of interactive control matters. Management intervention during project execution are negatively related to project performance. These findings suggest that corporate managers should be careful about actually interacting in team decisions and should not change resource allocations and control standards during the project. This stands obviously in contrast to the "catalyst" role of the upper managers found in other studies. According to the authors the catalyst role with its positive effect stops, where the more encouraging role shifts to a more directive role.

Summarizing, the study of **Bonner** *et al.* suggests that the creative potential of cross-functional NPD teams is likely to be more fully realized when they are given the flexibility (within a broad strategic direction) to determine their own project controls and especially to pursue their own processes and procedures. Furthermore, the study suggests that the corporate management would be wise to involve project team members in the development of the operational controls for the project, and to be very selective in intervening in project activities.

3.9 Steering Complex Innovation: R. Rycroft and D. Kash

Rycroft *et al*. are investigating the "patterns of change" in firms operating in ambiguous economic environments. They focus their research on the dynamics of the self-organizing networks in those firms. As the authors state, the economic success of companies in today's fast changing environments depends to a great extend on the participation in complex self-organizing networks that innovate complex technologies: "***Participation in self-organizing networks of firms that exist to carry out the repeated innovation of complex technologies is becoming increasingly important. To achieve and maintain leadership, these networks must achieve a mutually reinforcing fit among organizational core-capabilities, complementary assets, learning, and linkages to the external environment***" (2000: 29).

Figure 3.2: ***The Self-Organizing Networks***



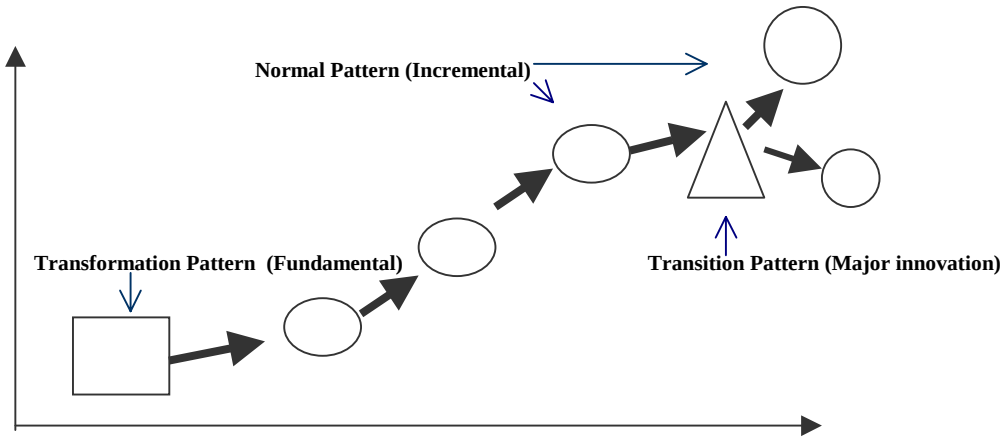
In RYCROFT, R. & KASH, D. (2000): "Steering Complex Innovation", in *Research Technology Management*, p.18

Rycroft *et .al.* describe three distinct innovation pattern within these networks operate and characterize the resulting opportunities and challenges for the corporate management:

- "Normal" pattern,
- "Transitional" pattern,
- "Transformational" pattern.

Rycroft *et al*. describe the opportunities and challenges for the corporate management resulting from the three innovation pattern.

Figure 3.3: ***Three Pattern of Complex Innovation***



In RYCROFT, R. & KASH, D. (2000): "Steering Complex Innovation", in *Research Technology Management*, p.20

As **Rycroft** *et al*. point out, nowadays, the trend goes towards more and more complex technologies. Products and/or processes of e.g. airkraft- or telecommunication equipment cannot be fully understood, stored, and communicated by a single employee or team. Therefore, the building of efficient networks is of crucial importance. Under "complex networks", the authors understand linked organizations, firms, but also universities that create, encompass, and integrate the various knowledge and skills, both tacit and explicit, required to innovate complex technologies. "Self-organization" means the ability to reordering themselves into more complex structures and for applying more complex processes without centralized and detailed corporate management control.

Going align with other authors, **Rycroft** *et al*. describe the innovation of complex technologies as a rapid, highly disruptive, and discontinuous change. The authors highlight two critical issues found during the study of such complex technological innovation processes:

- The corporate management must be deeply involved in any complex innovation process, but not with the purpose to control it in detail. In general, the corporate management has not the complete knowledge needed to direct successful innovation in all details. Another reason for establishing a context for more autonomous strategic behavior is that complex network organizations often adapt in "nonlinear" ways—they may establish new adaptations in the form of new organizational characteristics and routines (e.g., new ways of interaction among work groups) that are of "emerging" character and difficult to control. Therefore, managers must try to influence only the context of innovation.

- The building and modification of the strategic context is crucial dependent on the language and terminology that managers use. **Rycroft** *et al*. believe that their new terminology is one of the major contributions that their study may provide to the management of complex organizations. Terms like "self-organization" or "emergence" stands for the creative, dynamic, non-linear, and evolutionary work that is already typical for some forward looking managers.

As we already described, complex innovation is characterized by three pattern:

3.9.1 The "Normal" Pattern

The "normal" pattern is characterized by continuous incremental innovations that occur within an established technology design carried out by an established network that also experiences incremental adaptations. If we take the semiconductor industry as an example, we can find more than 20 years of incremental advances in semiconductor fabrication and their associated networks. Within this pattern, managers need to:

- enhance core-capabilities by improving performance
- acquire complementary assets to exploit established core-capabilities
- engage in local learning
- pay close attention to well defined markets.

As the authors remark, at this pattern stage, the technological designs of products / processes remain basically the same before and after an incremental innovation. This includes also the teams involved in the networks. There may be some slight changes in the suppliers of complementary assets. The management focus is to improve existing capabilities by learning "locally" and adding new complementary assets to the firms core-capabilities. This learning process should happen without delay (always preventing competition to catch up). That means for the persons involved to start to operate with the minimum of information sufficient to accomplish the process/product, and not trying to understand first every process totally in detail.[22]

But as the authors highlight, this situation bears a high strategic risk, because it prevents the corporate management from observing and following new approaching pattern trends. As the authors advise, to mitigate this effect, the managers should permanently proof their own network and their environment for indicators of pattern change.

[22] Here, the network is concentrated on incrementally improving on critical knowledge and skills, and not being hindered by knowledge that is not immediately useful to conduct the project.

3.9.2 The Transformation Pattern

This pattern stands for the innovation of technologies that have designs that are crucially different from existing ones and require the building of fundamentally different network organizations. To keep the semiconductor industry as an example, the technological and organizational changes that took place when the IC technology ("integrated circuit") replaced the "vacuum tubes" technology are a good characteristic for a transformation pattern. That way, the semiconductor industry was born.

Within the transformation pattern, the corporate management need to:

- create new core capabilities,
- invest in highly diversified complementary assets,
- engage in cosmopolitan learning,
- develop strong non-market relationships.

According to the authors, the transformation pattern is highly ambiguous with fundamental changes in technology and networks. So to speak, everything is going to be changed. Transformational innovations are not the general case, but when they occur, they require new core-capabilities. These new capabilities may be transferred from some other technological sectors. But, transforming state of the art R&D technology into commercial applicable technology is a very unsecure and time-consuming enterprise. This transformation process also needs new complementary assets, but here, getting the right asset combinations is also critical. ***One strategy the authors propose is to investing in assets that seem at first sight unrelated and incongruent to each other and to the firms current core-capabilities***. The networks must learn in ways that should be unrelated to the past organizational routines. As the authors advise, the organization should emphasize not only a broader range of R&D initiatives, but should engage in more extensive technological intelligence-gathering, establishing a wider variety of partnerships (especially for tacit knowledge). No potential source of knowledge or skills should be neglected.

As **Rycroft** *et al.* found out, transformation patterns tend to emerge in the absence of a market or the absence of customer demand. This situation has been called "***a technology in search of a market***", because there is a very low user knowledge and interest. This low interest may, on the other hand, reduce the incentives for networks to develop markets aggressively enough. The weakness or absence of market forces is often cited as a reason for not following any new innovation path that turns out to be a transformational one. During that transformational situation due to the lack of market regulations, the relative importance of other existing institutions (e.g. public policies) increases. These institutions

may help the firm to allocate more creative resources to high-risk transformational innovation without any existing market and customer demand.

3.9.3 The Transition Pattern

The "transition" pattern could be described as a major change in the current established technology design. In general, this change results from the integration of a previously incongruent technology. Networks in the transition patterns often establish linkages to new organizations. An example is the use of x-ray lithography to fabricate high-performance semiconductors.

Within the transition pattern, the managers need to:

- expand (and eliminate) core capabilities,
- acquire complementary assets to explore new areas of core capabilities,
- engage in regional learning,
- balance market and non-market linkages in the selection environment.

As **Rycroft** *et al* explain, when transitions occur, the firm with its management and networks has to cope with a high uncertainty about the design characteristics of the new technology. But, because of the fact that transitional innovations can rely on an accumulated knowledge base, the management can have confidence to solve most of the "transition issues" that occur by undergoing such major modifications. As the authors describe, such transitions involve some new core-capabilities and complementary assets. For this purpose, the network is linking incumbent capabilities with capabilities developed in another sector to provide a new source of competitive advantage. At this stage, former capabilities may become obsolete while other neglected capabilities are becoming now very important. For this aim, networks in a transition process need at the same time to expand and eliminate their core-capabilities.

A proposed way to explore new areas of core-capabilities may be the linkage to new complementary asset suppliers. Integrating new capabilities often makes it necessary to establish product/process standards that help to link capabilities from previously unrelated industries. As the authors describe, during a transition, network learning must being extended form the "local learning" in the normal pattern to "regional learning". That learning process could be described as moving from a narrow, but deep knowledge base to a broader, but "shallower" knowledge base. The researchers highlighted also a shift to more external oriented and long term search/discovery activities encompassing increased R&D activities. This learning process remains in the same broad technological area. A network in this

transition situation must undergo a kind of trial-and-error experimentation, while failures should be seen as an important source of learning.[23] As **Rycroft** *et al*. note, market stability and predictability are eroding during the transition period, because the market has less knowledge about the new performance capabilities being developed. In such situations, non-market relationships (e.g., links to government) have the same or higher importance as market processes, because they may provide some additional stability for the management, making their strategic decisions.

3.9.4 Conclusion: Demand on Managers

As **Rycroft** *et al*. describe, the greatest demands on managers are placed during the transformation and transition patterns when uncertainty and risk are very high, but the greatest danger to companies occurs during the normal pattern, because it is so difficult to move away from a successful technological design and network. Incremental innovations are where economic success lies for complex technologies. Networks are efficient if they are able to deliver incremental improvements in performance, quality and cost before the competition. Again, semiconductor provide a good example. In that industry, incremental advances in the capacity of semiconductors have been so regular that "Moore's Law" was formulated. But the incremental success of those networks may keep them rigid to adapt to pattern changes in the future.

As the authors describe, a successful network must hold some core-capabilities; that is, it must excel in some particular aspect of innovation. For instance, many complex networks hold core capabilities having to do with systems integration. Where there are gaps in core capabilities, networks must access complementary assets. Marketing might be a complementary asset for the network with system integration core capabilities. Organizational learning is the process by which new capabilities and assets are identified, acquired and shared among network participants. Successful network learning must be continuously updated to provide competitive leadership. And learning always takes place in the context of a broad selection environment, encompassing not only market forces, but also existing public policies.

Innovating complex technologies demands that networks achieve a mutually reinforcing fit among ***core-capabilities, complementary assets, organizational learning, linkages to the selection environment***. As **Rycroft** *et al*. point out, if the management is able to maintain this fit, it provides the firm a unique competitive position.

[23] Even some "unlearning" must take place, because the transition process will render some core-capabilities obsolete, or attribute them less importance.

3.10 The Dynamics of Product Innovation and Firm Competences: E. Danneels

Danneels[24] examines 'product innovation' from a resource-based perspective. His study examines how product innovation contributes to the renewal of the firm through its ***dynamic*** and ***reciprocal*** relation with the firm's competences. The author conducted his research in five high-tech firms of different age, size, and level of diversification. **Danneels** research purpose is developing a conceptual framework to understand how product innovations contribute to firm renewal. Common with our approach is the authors engagement to analyze the mutual relationship of product innovation with firm competences over time. His terminology is consistent with **Grant** (1991) who defined a "capability" (interchangeably with competence) as the capacity for a set of individual resources (e.g., patents, know-how, brand names, equipment) to perform some task or activity.

Danneels conceptual framework is based on field research and an integration of the strategic literature encompassing topics like "***product innovation***", "***organizational resources and competencies***", "***organizational learning***", and "***path dependency***". According to the author, in general, studies on product innovation do not consider the reverse direction of the product innovation—competence relation, i.e., the effect that new product projects in turn have on the firm's competencies and its development path. Going align with **Eisenhardt & Martin** (2000), **Danneels** sees product development as a dynamic capability of the firm, because of its ability to alter the resource configuration of the firm. He refers to **Eisenhardt** & **Martin** (2000) who state that researching the link between resource-based theory and product innovation will inform resource-based theory and strengthen its empirical grounding. According to the author, his research makes advances in applying resource-based theory to product innovation in several ways:

- The study explicates which resources are necessary for product innovation. (In general, empirical resource-based research is using secondary data and thus cannot explain resources in detail).
- The study describes how product innovation can serve as a vehicle for the renewal of firm competencies and comprising resources.

Following **Priem & Butler** (2001) who suggest that there is a great research opportunity to study the accumulation of resources and capabilities, **Danneels** research highlights how new developed products influence the firm's further development path. His framework shows also, how product innovation functions as a tool for organizational learning and thus contributes to firm renewal. Describing **Collis** (1994) notion of higher-order or meta-capabilities of the learning-to-learn type, **Danneels** de-

[24] DANNEELS, E. (2002): "The Dynamics of Product Innovation and Firm Competences", in Strategic Management Journal, Vol.23, pp.1095-1121

fines a second-order competence as the ability to identify, evaluate, and incorporate new technological and/or customer. The author follows **March** (1991) who argues that organizations engage in two types of learning activities. Firms engage in:

- ***exploitation*** (the use and further development of existing competencies), and they engage in
- ***exploration*** (the finding of new competencies).

Table 3.6: ***Competence-based New Product Typology*** [25]

Technology / Customers	Competence Existing in Firm	Competence New to Firm
Competence Existing in Firm	***Pure Exploitation***	***Leveraging Customer Competence***
Competence New to Firm	***Leveraging Technological Competence***	***Pure Exploration***

Returns from exploration are unclear, uncertain, and remote in time. Exploring new customers, as opposed to exploiting an existing customer competence, requires a proactive approach.

Table 3.7: ***Characteristics of Product Innovation Types: Exploitation => Exploration***[26]

	Type			
Characteristic	Pure Exploration	Customer Comptence leveraging	Technology Comptence leveraging	Pure Exploration
Market potential assessment	Relatively easy	Relatively easy	Relatively difficult	Difficult
Technological feasibility assessment	Relatively easy	Relatively difficult	Relatively easy	Difficult
Impetus from current customers	Strong	Strong	Weak	Weak
Returns	Relatively certain	Relatively uncertain	Relatively uncertain	Uncertain
Needed scope of market research	Narrow	Narrow	Broad	Broad
Needed scope of technological search	Narrow	Broad	Narrow	Broad
Competence to be acquired	None	Technology	Customers	Technology and customers
Project duration	Short	Medium	Medium	Long

[25] Danneels, E. (2002): "The Dynamics of Product Innovation and Firm Competences", in Strategic Management Journal, Vol.23, p.1105.
[26] ebd p.1106.

Following **Penrose's** approach, he considers also the path dependencies of the firm, viewing the direction of innovation in a firm closely related to its existing resources and capabilities. That way, he builds the bridge to **Teece** *et al*. (1997), who are focussing on the dynamic relationship between product innovation and competencies formulated in their "dynamic capabilities approach". According to **Teece** *et al*., the "dynamic capabilities approach" emphasizes that firms face path dependencies as they develop their competencies over time. That means that at any given point in time, firms need to follow a certain trajectory or path of competence development. **Danneels** derives from his empirical findings that the reciprocal interplay between products and competences accounts for these path dependencies. New products serve as vehicles for exploring new competences which are added to the firm's repertoire, and subsequently serve as a foundation for further products. Complementary to those path dependencies caused by technological choices, **Danneels** describes path dependencies caused by choices for certain ***customers***. That way, his study provided further support for the prior finding that customers have a strong impetus in a firm's product development.

3.10.1 Research Methodology

Danneels conducted case-studies using interviews, observations, and document data as data sources gathered in five high-tech firms, that varied in terms of age, size, and level of diversification. He selected different types of research sites to achieve a diverse sample that provides many possibilities for comparisons, which should enable richer theory development (**Glaser & Strauss,** 1967). He selected firms that were different in terms of their variety of resources of products, and that were currently at different stages of organizational development. In doing so, he is following **Rouse & Dallenbach's** (1999) call for a rich detailed investigation of the nature of firm resources through comparative case-studies. Going align with **Miles** (1979), he uses a multi-site study that allows for cross-site comparison and allows the researcher to see idiosyncratic aspects of any other site in perspective. He conducted interviews with those organizational members that were involved in new product development gathering their perspectives on and experiences with new product development. Some of the reports by interviewees were retrospective, other reports were contemporary with the current engagements.

The interview data were complemented with observations of selected activities in the organizations like daily activities relating to new product development and new product meetings. This allowed to gather unfiltered data from the studied processes. Additionally, the author received organizational documents like new product proposals, new product catalogues, print of web pages, business press articles. He hold regular contact with informants at the sites over a 2-year period, which enabled the researcher to track the development of each firm's new product activities over time.

Danneels used the so-called extended case method guiding his data analysis. According to **Burawoy** (1991: 26), the goal of the extended case method is to integrate and extend existing theory. The researcher examines the literature relevant to his/her problem, and employs the empirical data to fill in its gaps. The extended case method approach goes through many cycles of comparison between data and theory. It consists in the first line of two "running exchanges":

- Exchanges between literature review ⇔ data analysis
- Exchanges between data analysis ⇔ data collection

Within the first exchange, data analysis refers to relevant theories in the literature, while simultaneously the literature provides conceptual framework to aid in the interpretation of the data. The second exchange takes place by continuously moving back and forth between data collection and analysis. **Danneels** initial data collection at each firm focused on developing an overall understanding of the process of new product development at that firm using a standard interview guide. In later interviews he asked more specific questions to refine and elaborate themes that emerged from the analysis of earlier conducted interviews. During all interviews, he encouraged informants to illustrate their statements with specific events and examples form specific projects. He stopped his data collection when additional data resulted in minimal incremental understanding (**Lee**, 1999).

He analyzed interview transcripts, observation notes, and documents looking for common themes and patterns (**Miles** & **Hubermann**). He sorted these common themes and grouped them to ***conceptual clusters*** (**Berg**, 1989). These conceptual clusters are sets of closely related analytic ideas referring to:

- "Resources"
- "Linking/delinking/relinking"
- "Leveraging competence"
- "Path dependency"
- "Second-order competence"

These conceptual clusters formed the basis of the organization of the presentations of his findings. For credibility reasons, **Danneels** checked his emerging insights with the informants in a second interview.

3.10.2 Leveraging Firm Competence trough Product Innovation.

Danneels argues that leveraging new products involve abstracting away from the particular product in which the competence is currently embedded, determining the essence of the competence (termed "delinking"), and in a second step linking that incumbent competence with a new competence (termed

"relinking") to form a new product. The author follows **Hamel & Prahalad** (1994), who argue that in order to leverage core-competencies, managers need to escape a product-centric view of their firm, and examine the capabilities on which their products are based. Managers must work hard to abstract from the current product visioning how the underlying competence might be applied in new product areas.

Table 3.8: ***Linking Activities by Type***

Technology / **Customers**	Competence Existing in Firm	Competence New to Firm
Competence Existing in Firm	New linkages among **existing** competences	• Delink customers from product • Relink customers to new technology
Competence New to Firm	• Delink technology from product • Relink technology to new customers	New linkages among **new** competences

3.10.3 Managerial Implications

As a further step, **Danneels** derives implications for the corporate management. As we described above, the relationship between new products and firm competencies is examined over time to gather a dynamic understanding of how product innovation contributes to firm renewal.

When examining the renewal potential of a particular new product, managers can classify it in the typology by assessing its degree of fit with the firm's existing competencies, and their constituent resources. Managers should examine which resources are already in place, and which need to be built. Next, managers should evaluate whether their firm possesses the necessary second-order competencies to succeed at this level of exploration. Or so to speak, does their firm have the R&D competence required by a technological exploration project, or the marketing competence necessary for customer exploration.

A honest assessment of the firm's second-order competence gives further insight into which type of leveraging the firm is most likely to be successful at. Firms with great R&D competence are best suited to expand by offering new technologies to their existing customer base, whereas firms with strong marketing skills might better leverage their technology to different markets.

An organization that wants to build its marketing components may develop it skills in such areas as:

- Assessing the potential of new markets.
- Setting up new distribution and sales channels.
- Leveraging brand /company reputation to new markets, etc.

Building an R&D competence would involve building skills in such areas as:

- Setting up new types of manufacturing facilities and operations,
- Assessing the feasibility of new technologies,
- Building networks of contacts with research centers, and
- Recruiting engineers in new technical areas.

According to **Danneels**, innovations outside of the core-business of the firm need to be especially supported in order to succeed, as they take longer to develop and do not have a clearly defined and measurable market. For exploitative projects, firms can use their technological and market knowledge to make accurate projections about the technological feasibility and the market success of the new product. While for exploitative products traditional measurements are appropriate (e.g., Net Present Value), for explorative projects, however, more strategic or visionary criteria are needed. For competitive comparisons, the firm may also gauge the portfolios of its current or potential competitors.

Danneels research contributes furthermore to the debate on how to define and measure new product success. The measures of success used in most new product research view the project in isolation from the organizational processes. The projects potential benefits for later projects are seldomly taken into account. As the author argues, a product that failed when judged on short-term financial measures may have contributed knowledge that could prevent more damage on a later project. Especially for explorative products, measures of organizational learning may be more appropriate than financial measures of future performance.

3.11 Summary

Before we go on with the introduction of our research methodology, we will shortly summarize some highlights of the Literature Review that helped to structure our ideas for the design of our own case-study setting. Within the previous research, we selected studies that are approaching the "phenomenon" of core-capabilities from different perspectives. On the one hand, researchers are engaged in improving the determination of the firms' resources and capabilities by designing more advanced resource/capabilitiy "categories". Their studies stress the strategial importance of an in-depth understanding of the firms valuable resources and capabilities.

Consensus on core-capabilities can be positively related to firm performance. Several authors i.e. **Marino** (1996) are developing conceptual models of the consensus building process on key resources and core-capabilities. Those core-capabilities for which the corporate management could build consensus and which had high ratings across all case-studies were:

- Brand management
- Distribution logistics
- After-sales support
- Speed and flexibility of design modification and development
- Management of vendors.

In general, these core-capabilities allow the firms to perform some basic functional activities better than their competitors. The resurces/capabilities identified with the highest potential to sustain the firm's competitive advantage in **Hall's** (1993) investigation were:

- Company reputation
- Product reputation
- Employee know.

A crucial discovery is the fact that core-capabilities have a "downside" that may be dysfunctional in some cases, hindering the further development of the firm. There are existing specific organizational factors as well as social factors that can be obstacles for the inter-departmental collaboration on new products. **Dougherty** (1989) defines two of such "interpretive" barriers:

- The first barrier are the "thought worlds" of the different departments, leading to their own sense making. Thus there often occurs an error to assess each others problems.
- The second interpretive barrier are the core-capabilities themselves, because they may emphasize the status quo and reinforce the separation between the departments. As the author discovered, product developers who failed, applied the organization's usual routines for product development,

while the successful development teams created new ones. **Dougherty** advises to create a "meta-level" where a common noun can be found. In her case study, the discussion group generated new evaluation criteria for the product, based on the "common noun" prinziple.

A firm may create commonalities if it has effective capabilities for external / internal integration activities. **Iansiti** & **Clark** (1994) found strong empirical support for the link between integration capability and the sustained performance of the organization. The most successful and consistent performers in each industry are characterized by high levels of external / internal technology integration capability. They react to their ambiguous environment by continually integrating new competence within their dynamic capability base.

Intrapreneurship is a major impetus for dynamic capabilities. Following this perspective, several case-studies and surveys have been made, with regard to a specific "set of conditions" which may support an intrapreneurial environment. The elements that were found as being consistent were:

- Management support for intrapreneurship
- Organizational structure
- Resource availibility.

The studies of **Kuratko** *et al*. (1990) and **Carrier** (1991), on which we focused, do not statistically confirm this assertion, but they do support the notion that there is a set of dimensions that are reliable and stable. Orienting on those factors can guide the corporate management to develop a better intrapreneurial climate.

The research on intrapreneurship in small business has its own aspects and characteristics and cannot be based only on the intrapreneurial theories developed in the context of large enterprises. **Carrier** identified factors like "personal promotion" that have influence on the emergence of intrapreneurship in small businesses. For small business intrapreneurs (different to large company intrapreneurs), promotion is clearly a significant reward, because it enables the intrapreneur to be nearer the owner-manager as final decision maker. As the author found out, intrapreneurs in small firms will tend to leave if their expectations are not met and thus becoming competitors in sectors where the entry barrieres are not so high. On the other hand, all owner-managers stated in the interviews that all intrapreneurial activities which resulted in innovations reinforced the firm's competitive advantage. All owner-managers maintained as well that their firms' growth was made easier by the cooperation with employees with intrapreneurial traits. **Carrier's** research shows that the structural and relational aspects between owner manager and intrapreneur are the crucial factors in building an intrapreneurial context in small firms.

By launching development projects, the corporate management is often faced with a trade-off of how to apply adequate control over new project development teams that by their nature require some degree of flexibility, creative freedom and participative decision processes. **Bonner** *et al*. (2002) found support for the argumentation ***that process control imposed upon a devlopment project is negatively related to the project outcome.*** Also strong formal process control is associated with lower performance for incongruent projects. Not like the "catalyst role" of the upper managers found in other studies, ongoing management intervention during project execution are negatively related to project performance. The study found no positive relationship between the use of output controls and project performance which stands in contrast to the strategic literature. Also in contrast to the strategic literature is the fact that it could not be found that especially team-rewards in contrast to individual rewards have a positive influence on project performance.

In general, studies on product innovation do not very often consider the "reverse" direction of new products / projects on the firm's development path. **Danneels** (2002) discovered that ***product innovation has an impact on the overall renewal of the firm through ist dynamic and reciprocal relation with the firm's competencies.*** To avoid path dependencies he suggested to invest in assets that seem at first sight unrelated and incongruent to each other and to the firms current core-capabilities. He found also that path-dependencies are not only caused by technological choices but also by customer choices that have a strong influence on the development path of the firm.

As the general development goes towards more and more complex technologies, ***"self-organization"*** is seen as to be essential for the ability to reordering themselves into more complex structures and for applying more complex processes without centralized and detailed corporate management control.

CHAPTER 4: RESEARCH METHODOLOGY: THE CASE-STUDY RESEARCH

In the following chapter we will describe the basic elements of our selected case-study approach. Case-study research has been a common research strategy in traditional fields like psychology, sociology, political science, ethnography, but it is nowadays increasingly used in the field of strategic management.

4.1 Different Epistemological Categories of Qualitative Research

As **Savage** & **Black** (1995) describe, the researchers' epistemological choices ("how do we know?") and their teleological choices ("why do we know?") have influence on:

- the types of data they will collect,
- the ways in which the field researchers analyze their collected information, and
- the kinds of interpretations they will derive from them.

Studying the management of dynamic core-capabilities requires a qualitative in-depth look at people, processes, and contexts of organizations. For this purpose we need a research methodology that enables us:

- to analyze and to describe complex processes /phenomena within organizations, and
- to gather and to process in the first line qualitative data.

The qualitative approach allows the researcher to grasp and to understand the characteristics of real-live events such as organizational and managerial processes. As **Yin** (1989) describes, in general "how" and "why" questions are being asked ***"about a contemporary set of events, over which the investigator has little or no control***". The researcher who designs a research can use more than one strategy in his research setting (i.e. a survey within a case-study). The various strategies are not mutually exclusive.

Following **Yin** and **Miles** & **Hubermann**, we combine different qualitative methods such as ***interviews***, ***direct observation***, and ***archival data analysis*** providing multiple sources of evidence to analyze and to describe complex processes like the development of the organization's performance and/or the implementation of its strategic concepts (**Yin,** 1989; **Snow** & **Thoma**s, 1994). Combining multiple sources can also mitigate the empirical weakness of one method (like distortion effects in the interviews) by the strengths of the other.

Rouse & Dallenbach (2002) highlight that there is an advantage for the researcher as "outsider" when doing qualitative case-study research inside organizations, especially when researching on tacit information. The "outsider" can see issues in organizational cultures that have so much been taken for granted that the team members cannot see these issues themselves. As **Yin** (1989) points out, often the various research strategies are seen as hierarchically ordered, and case-studies are mainly attributed to exploratory research approaches. But case-studies are more than only an exploratory research strategy. They can be used for all three mayor research purposes like ***exploratory***, ***descriptive***, and ***explanatory*** research.

The case-study relies on many of the same techniques as a history approach, but it adds two sources of evidence not usually included in the historian's methodology: "direct observation" and "systematic interviewing" (**Yin,** 1989: 20). As **Yin** further emphasizes, the case-study's unique strength is its special ability to deal with a full variety of evidence like ***documents, artifacts, interviews, observations***.

The case-study approach does not follow a sample logic and represent a "sample". The researcher's concept is to expand and generalize theories (analytic generalization) and not to enumerate frequencies (statistical generalization). As the author explains, case-studies are generalizable to theoretical propositions and not to populations or "universes". He describes a case-study as empirical inquiry that:

- investigates a contemporary phenomenon within its real-life context; when
- the boundaries between phenomenon and context are not clearly evident; and in which
- multiple sources of evidence are used.

As **Yin** (1989) notes, ***the case-study is a way of investigating an empirical topic by following a set of pre-specified procedures, while the comparative case methodology is described as a distinctive form of multiple-case-studies.*** As prescriptive for the quality of any methodological design, a case-study setting must maximize the following aspects like "***construct validity***", "***external validity***", "***reliability***". Here it is also advised to review previous research to develop and formulate sharper and more insightful questions about the topic.

As **Miles** & **Hubermann** (1994) note, qualitative field-based research can be conducted from many research fields like ethnography (anthropology), participant observation (sociology), and case-studies (psychology). Underlying and "intertwined" with these methods are various diverse philosophies and schools of thought, like critical theory, hermeneutics, phenomenology, and symbolic interactionism (**Tesch**, 1990; **Miles & Huberman,** 1994). **Wolcott** (1992) underlies qualitative research the analogy of a tree with three "roots":

- ***Experiencing***,
- ***Enquiring***, and
- ***Examing***.

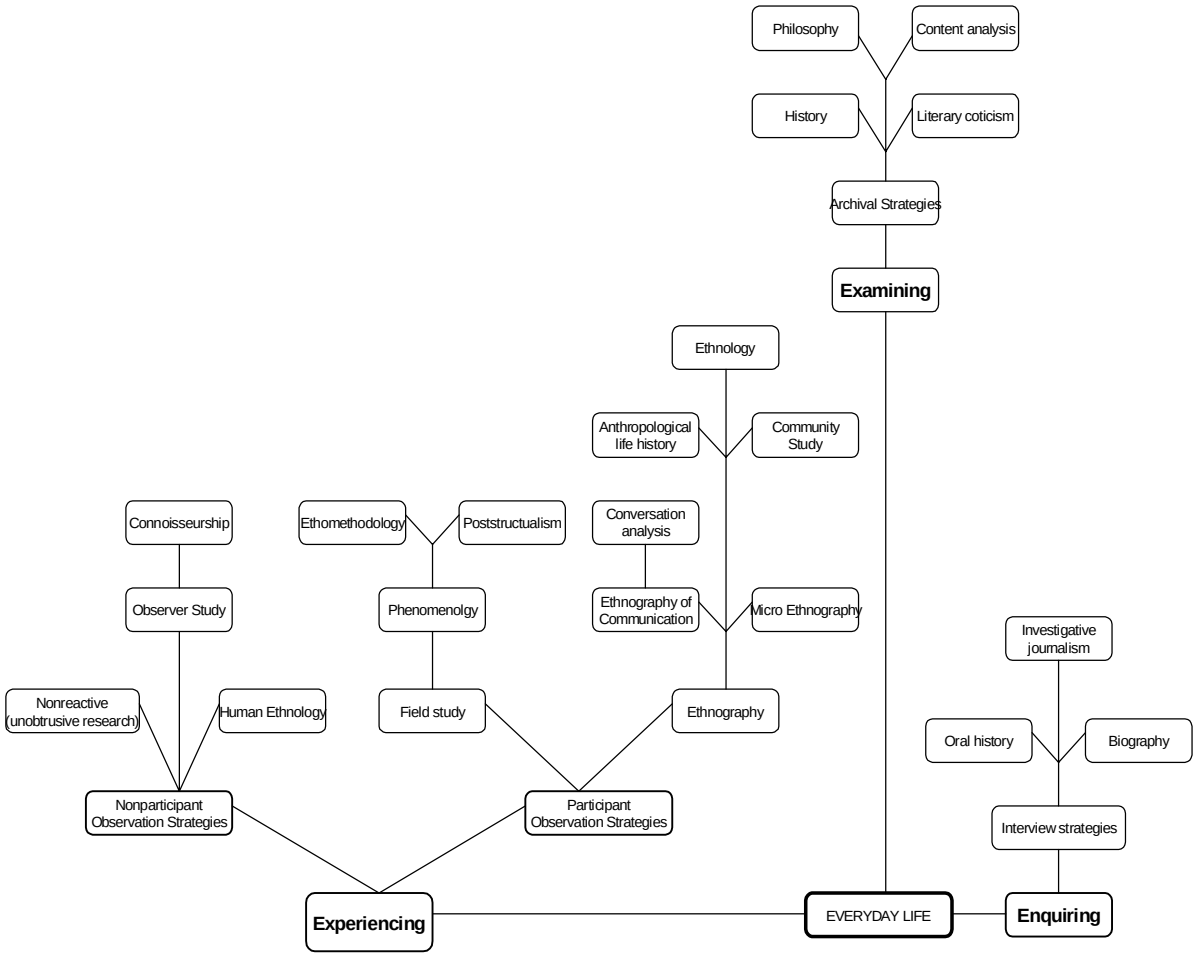
These roots (epistemological categories) representing different ways of knowing, encompassing "non-participant observation", "participant observation", interviews, and "archival techniques". According to **Wolcott**, this analogy should be used as a simplification to demonstrate that researchers often draw upon methods that depend on various epistemologies.

- Field research methods based on **** experiencing*** include any method of data collection where the researcher operates actively in the research field and has a legitimate role (i.e. as employee) among the others. The researcher records the data he or she has perceived by observing and sharing the normal activities with the members/colleagues in the field.

- Field methods based on **** enquiring*** as a way of knowing encompass all types of interviews. The unstructured, face—to—face interview and the structured, closed-ended questionnaire are the two extreme examples. As **Wolcott** describes, by interviewing field site members, the researcher applies methods that depend on intersubjectivity (mediated by language) and which highlights the respondents‘ cognition.

- Field methods based on **** examining*** are in the first line the study of archival data items but with a broad spectrum, ranging from historical records to modern artifacts. (Included in this way of knowing are computer records, journals, memos, logs, tape recording, and videos, but also press articles and other external documents about the field site.

Figure 4.1: ***Different Epistemological Categories of Qualitative Research***



In WOLCOTT, H.F. (1992): „Posturing in qualitative inquiry“. In M.D. Le Compte, W.L. Millroy, & J.Preissle (Eds.), The handbook of qualitative research in education, pp.3-52. New York: Academic Press.

4.2 The Qualitative Case-Study Approach as Ownstanding Research Strategy

We go align with **Dachler** (1997), who argues that qualitative research should be considered as being more than only an "appendage" to the quantitative research designs. In many former cases, qualitative organizational research still uses many of the agendas, problem definitions, justifications, etc. that are stemming from quantitative research designs. That way, qualitative methods are seen more as an useful addition to quantitative research. But nowadays , the field of strategic management need to use research designs that are more appropriate to analyze complex organizational phenomena.

As described before, qualitative case-studies are appropriate to analyze and to understand complex organizations operating in highly ambiguous economic environments like the semiconductor industry.

One the other hand, the discussion whether to choose a qualitative case-study design versus a quantitative approach for our research has to be seen from a different perspective, if we acknowledge that all our "insights" or knowledge are not data-driven but socially constructed. As **Dachler** (1997) (based on **Luckmann** (1966)) explains, the meaning of every data or event of the scientific "facts" we found are not independent of the socially shared "local ontology" of the research community the researcher lives in. Such socially shared conceptions are the basis on which the researcher considers the data as important or not relevant.

According to **Gergen** (1994b) and also **Quinn** (1960) there is no "objective" way in which it can be decided that some "observation" is more "real" than other empirical data. "***In the end, it is always a matter of "social-subjective" interpretation through the discourse within a given language community which makes reference to different aspects of a context, i.e. the shared ontology already in place. Depending on the "local ontology" of a given research community, possible observations are given very different meanings and "validity"."***

Collected data (especially quantitative) seem to be objective but they are nevertheless socially and historically derived. Consequently, the design of any research, the statement of the research problem, the choice of the method, etc., are all an outcome of social processes in constructing what is understood as "real". We go align with the author and argue that a lot of the debates about the scientific value of the distinction between ***subjective-interpretative*** issues and ***objective (countable)*** phenomena and its research consequences could be neglected, if it would be accepted that fundamentally all research is subjective-interpretative.

Within a phenomenological or "social constructionist" epistemology, we may also be able to analyze knowledge ***processes*** (rather than content) in the organizational settings. Here the research methodol-

ogy is the knowledge process itself. In contrast to quantitative research settings where the researcher as subject is using tools to discover the world "outside" him/herself, the researcher in qualitative research settings is seen as being an integral part of the methodological process. While the researcher in quantitative research settings considers everything "subjective" as an error, he/she is always concerned not to "contaminate" the outcome of the research. But nevertheless, the research objects are investigated with reference to the researchers ontology. Here, what is labeled as "error" for quantitative methodologists is taken as outgoing fundament for "knowing" in qualitative research.

As **Dachler** argues, the debate over quantitative versus qualitative research should not be a discussion of what is more or less operational for doing research or a choice between more or less valid theoretical epistemologies and positions. It should be a choice to what extent the one or the other research setting values realities which hinder or help certain projects which are of central concern to us. We have to recognize the process by which organizational research may ***reproduce***, precisely that issues which we would like to improve through our research.

4.3 The Qualitative Interview

Within our approach, the qualitative interview is supposed to be a major source to enrich our knowledge about the case. In the following we will describe the basic elements, distortion effects, and research settings in which it is seen as being appropriate to use the qualitative interview as research method.

According to **Lueger** & **Schmitz**, the qualitative interview is a very often applied research approach that could be defined as:
-Face-to-face interaction with
-contents that are self-experienced histories, perspectives, estimations of the environment etc.
-the interview is designed to allow the respondent to take the active part and dominance in the conversation.
-The objective is to grasp “the recapitulation of own experience in everyday direct-conversation” (**Schütze,** 1976:11).

As **Cicourel** (1970) remarks, with the help of qualitative interviews, it is possible to grasp the perspective of the interview partner and his structure of reality. The interview partner demonstrates, how he understood the question, and what is relevant for him. Thus, it is possible for the researcher to reconstruct latent and complex structures and sense making within the interview stories.

The subject-object relationship of interviewer and interviewee changes to a subject-subject relationship. But, also in the qualitative interview remains an asymmetric communication relationship, because of the different interests of the interview partners.

4.3.1 Research Setting for the Application of Qualitative Interviews

Lazarsfeld enumerates research settings in which it is appropriate to use the qualitative interview as research methods (in **Friedrichs,** 1973: 226):

- to clarify the meaning of an interviewee's answer
- to determine a crucial aspect of an interviewee's opinion
- to analyze the influencing factors on the formation of an interviewee's opinion
- the analysis of complex pattern of attitudes
- to interpret the motivations
- to analyze and interpret departing cases
- to analyze the effects of the individual experience on special sitautions
- to ascertain the frame of reference of an interviewee

As **Fridrichs** (1973) notes qualitative inquiry provides insight in structures of unknown problems (exploration) as well as it is extending the results of standardized interviews. Qualitative Interviews are in the first line concerned to highlight the meanings of the interviewees and to construct the latent structures of their acting. The interviewees should obtain enough possibilities to structure the content of the conversation. Such "openness" increases the information value and allows the interview partner to describe his/her relevant perspective. To value the meaning of the respective statements, it is necessary to consider the social frame of reference of the interview partner i.e. job, internal and external contact etc. Implicit knowledge and the reconstruction of facts should be given special interest. Also deviation should be given attention.

4.3.2 Distortion Effects in Qualitative Interviews

Teuscher describes in the following some difficulties within the empirical sociological research field due to the resemblance of researcher and research object (and their value systems/norms etc). As we described before, the results are also depending on the "local ontology" of a given research community which evaluate the findings. Thus, it bears some difficulties for the researcher in the field to conduct the analysis independently form his own social and cultural frame of reference and without any prerequisites. As **Kohli** (1978: 15) argues, the question is, whether the interviewer's and interviewee's realities are corresponding. It is very difficult to analyze if these constructed realities of the field researcher have the same meaning and value for the interviewees. **Cicourel** (1970) found out that often

research data are misinterpreted, because of the different knowledge bases of the interview partners. Another type of distortion effect that could occur during the interviews is the so-called "Hawthorne effect". This effect describes the fact that the research objects change their behavior or statements when they are observed or interviewed. In general, we may categorize the distortion effects into two groups, the effects linked to the interviewee, and the effects linked to the interviewer:

4.3.2.1 Effects linked to the Interviewee

Reinecke (1991) describes different kinds of "response sets" that could be found during the interview:[27]

-Tendency to guess, to lie, to completeness.

-Preference of neutral and middle response categories.

-Preference of extreme response categories.

-Preference of velocity than exactness.

-Tendency of approval independent form the content (Acquiescence Response Set ACQ-RS).[28]

-Tendency, to answer “social correct” (Social Desirability Response Set).[29]

According to **Reinecke**, among the above mentioned kinds of response sets the "Acquiescence Response Set" ACQ-RS and the "Social Desirability Response Set" occur in a frequent and systematic way in empirical field studies.

4.3.2.2 Effects linked to the Interviewer

Scheuch (1973) defines the term "interviewer effect" as the non desired influence on the results of the research outgoing from the interviewer. **Kunz** (1969) distinguishes between "interviewer bias" and "interviewer error". Interviewer bias results from systematic distortion within the interview. The extent of the effect depends on the proportion of the mean variation of the data that could be addressed

[27] See also Cronbach (1946) und Messick (1968)

[28] ***Characteristics of Acquiescence Response Set***: Qualitative research designs which include in the first line dichotome (yes/no) answering categories provocate that the interviewee uses a "defensive strategy" and agrees in most of the alternatives, independently from the content of the question. This strategy is subconsciously used to avoid consequences if an interviewee has the feeling that he/she has not enough control over the situation (see Foster 1961; Carr 1971). Another situation, where such kind of agreed responses occur is when there is not enough interest in the research topic (see Esser 1975a: 305)

[29] ***Characteristics of Social Desirability Response Set***: Often, interviewees tend to a response that would be valued as socially desired within their normative system (see Esser 1975a: 323). Here, the content of the items directs the bias to such an socially desirable answer. “*A socially desirable response is defined as a true response to a personality item with a socially desirable scale value*" (Edwards 1957a: 28). Here, interest in the research topic and high motivation for a role-takeover enforce the tendency for a socially desirable response.

more to the interviewer than the respondents. **Macoby** & **Macoby** (1972:73) distinguish between six kinds of visible and invisible interviewer effects :

a) The visible characteristics:

Visible traits of the interviewer cause a distortion if the respondents see a relation between the topic and the characteristic of the interviewer (i.e. race, age, gender).

b) The invisible characteristics:

-the attitudes of the interviewer
-the expectations of the interviewer with regard to the attitudes of the respondent
-variations of the interviewer in the case of exploratory questions
-differences between the interviewer in recording the answers

According to **Hyman** (1954: 59) an additional influence on the interview have also the expectations of the interviewer. He distinguishes the following expectations:
-attitude-structured expectations,
-role expectations, and
-likelihood expectations.

But there exists no sufficient possibility to control or weaken the effects of attitudes and expectations, because they occur not in a regular manner. (**Richardson**, **Dohrenwend**, and **Klein**)

4.3.3 The Problem-Focused Interview

The problem-focused interview is appropriate in case of theory-oriented research that needs a more specific leading scheme. The various steps could be described as:

1) Analysis of the problem [Problemanalyse]
2) Construction of leading scheme through the Interview[Leitfadenkonstruktion]
3) Pilot phase [Pilotphase]
4) Conducting the interview [Interviewdurchführung]

As **Cannell** & **Kahn** (1953: 346) remark, to avoid distortion effects through suggestive questions, the questions should be formulated that they give no hint to any specific answer. Also **Macoby & Macoby** (1954, S.466) describe: ***"The question posed by the interviewer should in no way influence the direction of the answer. The researcher should try to gather the information without to direct the interviewee in the one or other direction".***

An important issue to address evidence to the propositions is the role of "theory-building" as part of the case-study design work. As **Yin** points out, the role of theory building, prior to the process of any data collection, has been neglected in the traditional way of doing case-studies. As he describes, ***the stated ideas will increasingly cover the questions, propositions, units of analysis, logic connecting data to propositions, and criteria for interpreting the findings*** (1989: 35). We can say that theory development prior to the collection of any case-study data should be an essential step in doing case-studies.

With regard to any descriptive theory the following issue should be taken into account:
-the purpose of the descriptive effort like management practice and organizational structures,
-the full but realistic range of topics that might be considered a "complete" description of what is to be studied,
-the likely topics that will be the essence of the description,
-the question why the researcher are proposing to do the study,
-what he/she hopes to learn as a result of the study.

As **Yin** (1989) states, theory development does not only facilitate the data collection phase. The appropriately developed theory is also the level at which the generalization of the case-study results will take place.

4.4 Methodological Design of the Case-Study

Formulating our case study design, we were referring earlier to **Yin** (1989), who describes practical guidelines for methodological research designs for single- and multiple-case-studies. Under "methodological design" the author understands the logical sequence that connects the ***empirical data*** to a study's initial research questions and the case-study's ***propositions*** to its conclusions. The major elements of the research design can be described as follows:

a) The case-study's research questions.
b) The case-study's propositions.
c) The case-study's units of analysis
d) The case-study's logic linking the data to the propositions
e) The criteria for interpreting the findings.

As **Yin** (1989) explains, the definitions and objectives should refer to those previously studied in other research to enhance continuously the theory and knowledge in this field.

4.4.1 Research Questions

As already described in the first chapter, we formulized the following fundamental research questions which will be complemented later on with the so-called Level-I and Level-II questions:

- How do companies carry out development projects?
- What are the companies' strategies, procedures, and practices?
- Are particular structures and processes commonly used?
- What characteristics make a development project successful beyond the targeted outcome of a new product or process?
- How can the corporate management align the whole organization with their strategies?
- How may the corporation create the appropriate strategic context?

4.4.2 Propositions of the Investigation

As general statement, supporting the resource-based view, we argue that for a successful performance of the firm in the long run, its corporate management has to understand and apply its distinctive resources and capabilities as an ownstanding component of strategy.[30]

[30] We argue align with Long &Vickers (1995), who state that if all members of the organization are aware of the company's distinctive capabilities, the development of such capabilities may be improved and competitive advantage sustained.

Proposition 1: Firms that are explicitly aware of their core-capabilities are successful in realizing various kinds of development projects, and thereby sustaining their competitive performance in ambiguous fast changing industry sectors.

We formulated the first proposition, presuming a positive relation between the application of capability-based strategies and the firm's performance. As a further contribution to the RBV-approach, we focus on the dynamic core-capabilities of firms, operating in German high-tech industries. Under the term "explicit awareness", we understand that the corporate management is initiating consensus building activities and establishes communication processes throughout the whole firm to determine and explain the firm's strengths to all employees.

Proposition 2: An intrapreneurial context supports the realization of incongruent development projects that depart from the firm's traditional core-capabilities.

We propose that an effective management practice for the realization of incongruent projects is the building of a strategic context that allows and supports intrapreneurial behavior.

Proposition 3: Development projects that depart from the firm's traditional core-capabilities are an effective tool for the further development of the firm's performance envelope.

Concerning the positive influence that accomplished projects have on the development path of the organization, we argue that especially "incongruent" projects are an appropriate method for the development of the firm's core-capabilities. We propose that in spite of the fact that the realization of those projects is problematic and work-intensive, it may prove to be crucial important for the sustainment of the firm's competitive advantage in the long run.

4.4.3 Units of Analysis

We formulated this "***multiple embedded"*** case-study design with the following hierarchical units and subunits of analysis:

- ***Total Organizational System Unit***: The dynamic core-capabilities of the organization

Here we are especially interested in:

-the development path of the organization

-the building of the strategic context

-the resources that are building these core-capabilities

-the influence of development projects on core-capabilities (structural, cultural effects)

- ***The Intermediate Unit***: The development projects

Here we are especially interested in:

-development projects (obstacles; support)

-influence of core-capabilities on development projects (supporting, hindering etc.)

-management practice for project initialization and conduction

- ***The Subunit***: The composed teams

4.5 The Linkage of Empirical Data to the Research Propositions with the Help of a "General Strategy"

Following the guidelines of **Yin** (1989:105 pp), we apply a general strategy for the case-study analysis that follows the theoretical propositions that had been the impetus for our case-study. In shaping the data collection plan, these propositions are supporting the structural organization of the entire case-study. "***The original objectives and design of the case-study presumably were based on such propositions, which in turn reflected a set of research questions, reviews of the literature, and new insights. The propositions would have shaped the data collection plan and therefore would have given priorities to the relevant analytic strategies*** ".

4.5.1 Analytical Techniques within a General Strategy: The Development of Criteria for the Interpretation of the Empirical Findings

From the three dominant analytic techniques for a single-or a multiple-case design proposed by **Campell** (1975); **Yin** (1989), we applied the "***pattern-matching***"[31] technique. The pattern matching technique compares an empirically based pattern with a predicted one. Following this technique, we collected **s**everal "pieces" of information from the same case and related them to our pre-formulated theoretical propositions. The idea behind is to describe two potential mutually exclusive patterns[32] and then to show that the empirical data matched one pattern better than the other. If the patterns coincide, the results are strengthening the case-study's internal validity. If the case-study is a descriptive one, pattern-matching is still applicable, as long as the predicted pattern is defined prior to data collection.[33]

[31] The researcher may also use "***explanation-building***" and "***time-series analysis***".

[32] Rival propositions called as "effects" proposition and "no effects" proposition

[33] In general, the following variables are being used as pattern construct:

-***Nonequivalent dependent*** variables*:* For example, if the results fail to show the entire pattern as predicted (even if one variable does not behave in a predicted way), the initial proposition needs to be questioned.

The role of the general analytic strategy could be described to determine the best ways of highlighting any differences as good as possible and to develop theoretically significant explanations for those different outcomes.

4.5.1.1 The Pattern Construct within our Case-Studies

Constructed Research Pattern for Proposition 1:

A) Constructed pattern for "explicit awareness": We assume that we would find in a firm that has established a high level of awareness the following issues:

- Visible consensus building process activities from corporate management /project managers
- Existing communication tools / activities throughout the whole organization including all hierarchies (+ extraordinary budget/support for such activities)
- Explicit reference of core-capabilities in formulated visions /mission statement

B) Pattern definition for successful projects: We understand under the term "successful", if the project had a positive long-term influence on the firm performance.[34]

Pattern Matching Logic A => B : We expect a high rate of successful projects, if we could find strong empirical evidence of our pattern "explicit awareness" of core-capabilities.

Constructed research Pattern for Proposition 2:

A) The intrapreneurial context pattern: As we described before, we used the intrapreneurial assessment instrument, developed by **Kuratko** *et al*. (1990). This questionnaire includes variables that are proofed to be a reliable indicator for the existence of an intrapreneurial context.

B) High rate of successful projects that depart from traditional strengths.

Pattern Matching Logic A => B: Following literally our proposition, if a firm has a high rate of successful projects that depart from the traditonal core-capabilities, we suppose to find also intrapreneurial variables indicating the existence of an appropriate intrapreneurial context.

-***Rival explanation*** as pattern construct: Each explanation encompasses a pattern of variables that are mutually exclusive: If one explanation is found as valid, the others cannot be.
-***Simpler pattern***: The fewer variables we use, the more significant they have to be to allow any comparisons of their difference. Nevertheless, there are some situations in which the simpler patterns are both relevant and compelling.

[34] Our subjective ratings follow the logic of Ancona & Caldwell (1992) who state: "We use subjective ratings of performance because these ratings are most often used to make budget and promotion decisions, they are rated to final performance evaluations, and more "objective" results are often a product of "subjective" ratings".

Descriptive Pattern Matching Logic for Proposition 3:

- We presume positive changes in the various subdimensions (i.e. structure, culture) of the organization's core-capabilities in the long term, if the project was successful.
- Existence of follow-up projects: We suppose hat follow-up project are initiated if the first (incongruent) project was evaluated as a positive conribution to the firm performance.

4.5.1.2 Precision of Pattern-Matching

With regard to the criteria for interpreting the findings, a researcher has to define before, how close does a match have to be in order to be considered a match? As **Yin** (1989) notes, currently, there is no precise defined way of setting the criteria for interpreting these types of findings. As the author explains, at this point of the state of the art of qualitative research, the actual pattern-matching procedure does not provide precise comparisons. The comparison between the predicted and the actual pattern is not measured under quantitative or statistical criteria. (Available statistical techniques are likely to be irrelevant because none of the variables in the pattern will have a "variance", each essentially representing a single data point). Major improvements in future case-study research could be made by inventing and applying more precise techniques. Until then, a research design should not be based on very complex and subtle patterns.

4.5.2 Three General Principles of Data Collection improving Construct Validity / Reliability

As **Yin** (1989) states, the following three principles are crucial for the data collection process (for all sources) and enable the researcher to achieve the ***construct validity*** and ***reliability*** of his/her case-study.

4.5.2.1 Principle I: Using Multiple Sources of Evidence

Any of the data sources like "interviews", "direct observation", and "archival data analysis" etc. should have the quality to be the "sole basis" for entire studies. Some studies are based on interviews but have not examined a single document; while others have relied on archival records but that have not undertaken a single interview. The reason for this isolated use of sources could be explained with the attempt of the researcher to choose the single most appropriate methodology he/she knows best. But according to the author, it is not advisable for doing case-studies to focus only on individual sources of evidence. Using multiple sources is exactly the major strength of the case-study design, because it allows to address a broader range of historical, attitudinal, and observational issues. This

exceeds other research strategies, such as experiments, surveys, or histories. According to **Yin**, the most important advantage by using multiple sources of evidence is the development of ***converging lines*** of inquiry that are based on several different sources of information. This also helps to deal with the potential problems of construct validity, because the multiple sources of evidence provide multiple measures of the same phenomenon (**Hammond**, 1968).

4.5.2.2 Principle II: Creating a Case-study Data Base

As **Yin** (1989) points out, the second principle refers to the way of organizing, structuring and documenting the data collected from the sample. The distinction between a separate data base and the case-study report has not become an institutionalized practice within the case-study methodology. For this purpose, the researcher may consider and learn from the practices applied within other research strategies, where documentation generally consists of two separate collections:

- the data of evidentiary base, and
- the report of the investigator (whether in article, report, or book form).

As the researcher amends, to a great extent, the case-study data are synonymous with the evidence presented in the final case-study report and a critical reader has no other possibility to inspect the original data base to draw his/her own conclusions. In general, a case-study project should create a formal, retrievable data base to give theoretically other investigators the possibility to review the evidence directly and not be limited to the final case-study report. Additionally, this data base will increase the reliability of the entire case-study. According to **Yin**, the lack of a formal data base is a major shortcoming of case-study research and needs to be improved in future research settings. The issue of developing the data base is described in terms of four components: ***notes, documents, tabular materials***, and ***narratives.***

- ***Case-study notes*****:** Case-study notes are the crucial component of a data base. They encompass various forms. Such notes may be a result of an investigator's interviews, observations, or documents analysis. They may be in hand written form, typed, on audiotapes, or on microcomputer diskettes, assembled in a diary, on index cards, etc.
- ***Case-study documents*****:** The main objective of case-study documents is again, to make the document readily retrievable for a later inspection.
- ***Tabular materials*****:** Any "tabular" material, whether based on surveys, observational counts, or archival data, can be processed like in other research strategies.
- ***Narratives*****:** Certain forms of narrative data like "open-ended" questions and answers should be more considered as part of the primary data base and not as part of the final case-study report. The

investigator, could then use this data base to compose the actual case-study report. As Yin remarks, because the answers are part of the data base and not of the final report, they do not need to have a presentable outlook. Their most important attribute is that they connect specific evidence—through adequate citation—to the crucial case-study issues.

4.5.2.3 Principle III: Maintaining a Chain of Evidence

Maintaining a "chain of evidence" helps the researcher to increase the reliability of the informations in a case-study. The plan is to enable the lecturer to follow the derivation of any evidence from the initial research questions to the final case-study conclusions. As **Yin** (1989) describes, the ultimate "chain of evidence" should allow even an external party, not previously involved in the study, to move from one point of the case-study to another, guided by clear cross-referencing to methodological procedures and to the resulting evidence. Following this argumentation, even under the conditions of a descriptive case-study agenda, where the researcher only have to "tell it like it is", the relevant evidence needs to be documented and cited. Without that information, the reader cannot follow the sources the author used for his/her research design and therefore cannot independently judge the reliability of the information.

4.6 The Formal Design of the Case-Studies

We conducted the empirical part of the work with the help of descriptive/comparative case-studies of 4 organizations in high-technology industry sectors. Two firms out of the small and medium sized category ULMOD.COM and COMPUTEX, and two R&D departments of larger high-tech companies, RECEIVE-TECHNOLOGIES and CARMEDIA. As our interview partner described, the R&D department of CARMEDIA could be seen even as a virtual ownstanding company, because of its special independent status and empowerment within the organization. CARMEDIA could in principle collaborate with its mother firm's competitors.

Table 4.1: ***Characterization of the Case-Study Firms***

	CARMEDIA	**RECEIVE-TECHNOLOGIES**	**COMPUTEX**	**ULMOD.COM**
Classification	Independent R&D Department	Dependent R&D Department	Medium to Large Sized Firm	Small Firm
Number of Employees	~400	~450	~150 at the Headquarter ~30 Sales Offices in Europe ~3 large Sales Offices (x60)	~15 Core staff + Subcontractors
Age	~6 Years (only R&D)	~10 Years (only R&D)	~10 Years	~8 Years
Operational Sector	Communication Multimedia Chip Technology	Communication Receiver Technology	Chip Distribution, Design-in Service	Communication Multimedia Technology
Type of Interview	Retrospective View	Questions on ongoing Project	Participating on ongoing Project	Retrospective View

In each of the firms, we gathered our data from documents, firm brochures, marketing information, from the internet homepage, personal interviews and in the COMPUTEX case-study also through participating observations. In each of the firms, we tried to build some longer relationships with our interview partner and conducted several interviews. The interviews lasted form 1 to 2 hours. During the first meeting, we made some informal information exchanges. Our interview partners described some general background info about their firms, while we explained our engagement in building a frame of reference derived from management practice of successful firms. During the second interview, we

confronted the interview partners with the concept of capabilities and resources and motivated them to formulate the core-capabilities of their firms. In the second part of the interview, we asked to describe the firm's strategic context and conditions for project work. In addition the respondents should explain if possible one project recently conducted that was a great challenge for the firm. A central topic was also the performance development and structural changes going align with the project. During the interviews, we tried to cover most questions from our Level-I question catalogue. After a certain time period, a first provisional report summarizing the respondents' answers was send to the interview partners and we called them again asking about a feed back on the results.

During the time of the interviews, COMPUTEX was looking for additional employees with economical background and they made me the proposal to work for them. In this case-study, I gathered the information through direct observations and shorter informal interviews during normal working hours, or during longer lunchtimes.[35]

With the empirical results of these 4 case-studies, we will conduct in chapter 9 a cross-case comparison referring to our research questions and propositions. Following our propositions could also be described as our "general research strategy". We follow **Rouse** & **Daellenbach's** (1999) call for a rich and detailed analysis of the nature of the firm's resources through comparative case-studies, and as **Miles** (1979) state: "***A multi-site study allows for cross-site comparison and allows the researcher to see idiosyncratic aspects of any one site in perspective***".

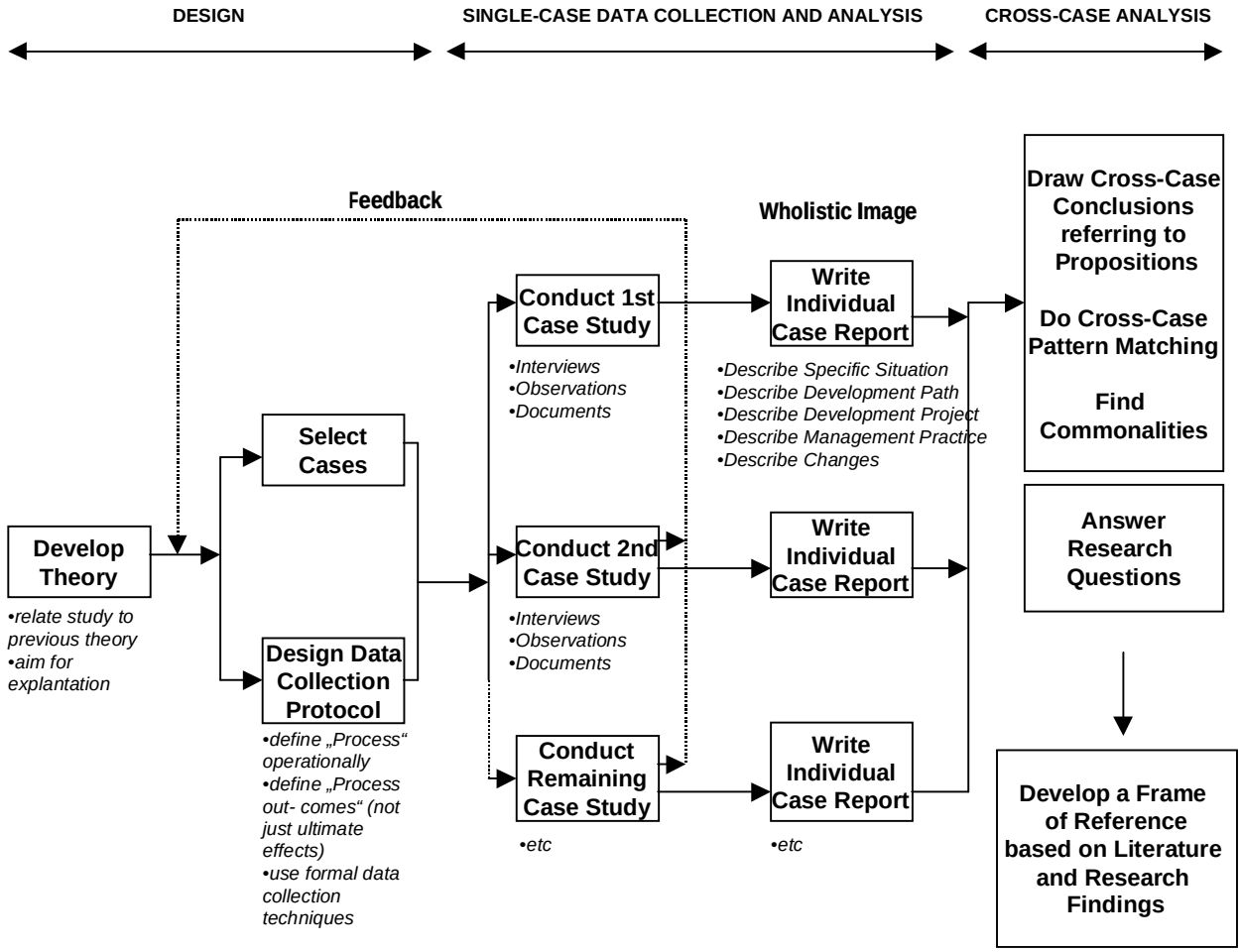
We made such cross-comparisons following a ***replication logic*** [36]. We engage to find empirical evidence for our initial set of propositions from:

- Literal replications**:** According to **Yin's** explanation, replication is the fact if similar results are obtained from all cases. (The replication logic is also applied within experiments)
- Theoretical replications**:** The replication does not really happen, but the exact reasons are known why there is a different or opposite pattern.

In a retrospective view, we saw the greatest challenge in getting access to the firm, and to find someone who was ready to tell about and to describe something of the heart of his/her company, its strategies and long term plans. In some cases we had the feeling that our interviewee was not sure if he really is allowed to tell us all these details. Originally, we had selected a sample of 6 firms, 4 SME's and two research departments, but after the first interviews, some of our interview partners hesitated to speak in detail about their strategies and practices because of the delicate content.

[35] In general, the employees of COMPUTEX knew that I was doing organizational research and also the topic was known. At the beginning, they were wondering, but after some time, I was seen as a "normal" employee.
[36] Not referring to a statistical ***sampling logic***.

Figure 4.2 ***Single- and Cross-Case Design of our Cases oriented on Yin*** **(1989: 56)**



The sub-groups/"conceptual clusters" of our investigation are the following:

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1) The ***organization*** (historical development; organization structure; hierarchy of visions; strategic context for intrapreneurship; economic environment)
2) The ***core-capabilities*** (encompassing resources that build these capabilities)
3) The ***development projects*** (strategic context;management practice)
4) The ***interrelationship*** of development projects and the core-capabilities (subdimensions)
5) Organizational /structural ***changes*** after the projects/experience

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Following **Yin**, we structured our research questions according to different "levels". **Yin** proposes different types of questions, on the one hand the direct interview questions, on the other hand "higher" levels of research questions that were answered by analyzing the answers from the field or archival research. The so-called "level-one"-questions, posed during the interview, were translated for this report, due to the fact that they were mainly written in German language.

The ideal case would be to answer all categories completely, but during the field study we encountered often certain difficulties due to the "delicate" status of the development project itself. To keep our disclosure agreement, we also had to use synonyms for the organizations names, and to give approximates for the size and the locations.

4.6.1 Level-I Questions

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1) **GENERAL INFORMATION OF THE FIRM**

a) The Organization Structure

- Could you please describe shortly the development history of your company?
- What was the first product?
- Do you maintain a key product/service from history?
- Could you describe crucial developments (i.e.quantum leaps) and why they happened?
- Did your firm make crucial changes during its existence?
- Could you give us some basic facts of your company (i.e. number of employees, how many departments)?
- Could you please describe the organization structure, maybe with the help of an organigram?
- How many hierarchical level does your firm have?

b) The Visions of the Organization

- Could you please explain the general vision of your company?
- Do you have different types of visions (i.e. mission targets)?
- Does your firm have short-term/long-term plans with regard to:
  -the improvement of its core-capabilities
  -its organization structure and processes
  -its market position/business fields

c) The Corporate Strategy

- *Could you explain in a few words your firms competitive strategy?*
- *Did you always use this strategy? Exclusively or in combination?*
- *Are your strategies oriented on your core-competencies?*
- *Does your firm use prognosting or benchmarking tools?*

d) The Strategic Context for Projects / Intrapreneurship

- Could you describe some aspects of your firm culture?
- Do you have entrepreneurship programs?
- Does your management support it? How does this support look like?
- Do you have some projects with entrepreneurial/experimental character?
  -If yes, could you please describe who initiated and supported the project, who take part, what was the objective, was the result seen as success?
- Would you say that it was worth initiating it? Why?
- Did the company make any use from it?

e) Character of the Industry Sector

- How would you describe your industry sector? Age?
- How frequent is there a major change in technology?
- How frequent are occurring gradually improvements?
- How long can you use your knowledge base approximately?
- Is your organization more product- or more service-oriented?
- Are the products/services more asset-based or more knowledge-based?
- Do you consider your economic environment as ambiguous/ unambiguous?

- Do you estimate your market as technology-driven or customer demand driven?
  -If driven by customer demand, how regularly do customer demands change?

f) Competitors

- Do you compete with your competitors on broad scale or focused markets?
- Do you have national/international competitors?
- How do you identify critical sources of performance differences with your competitors?
- Did you undergo strategic alliances with other companies? With which department especially i.e. logistic, F&E etc.?
- Are the firms with which you are working from the same industry sector?
- What is their main business / Main products / Service?
- Are your product portfolios / main businesses somewhere related?

2) CORE-CAPABILITIES

- Could you please describe the competitive advantage of your products/ services
- Do you offer your products on national/international markets?
- How long is your product lifecycle?
- Could you describe your company's core-competence?
- Could you describe what your firm makes best?
- What does it distinguish from its competitors?
- Could you describe which resources are responsible for this success?
- Could you describe how the management defined a core-competence?
- Who take part in this consensus building process?
- Was the result communicated through the organization?
- Do you have strategies to protect them?
- Do you have concepts to develop them?
- Could you please describe where you see a negative influence outgoing from these competencies?

3) DEVELOPMENT PROJECTS (PRODUCT / PROCESS)

- Could you please describe an initiated development project that departs to a major extent from the core-business of the firm.
- Who initiated the project?
- Where did the idea come from?
- Who take part?
- Where was it initiated? Was it isolated?
- Where did the financial support come from?
- What was the major objective, reason for the project?
- What was the type/character of the project (experimental, congruent, etc.)?
- What was crucial supportive?
- What was the major obstacle?
- What was the major mistake?
- What was changed through the project?
- Were there any positive effects besides the project success?
- Did it contribute to the improvement of the organizational performance?
- Did the project improve the core-capabilities?
- From which kind of project do you expect more positive contribution to the firm performance, from projects who are related to the main business or from those who depart from it?

c) Management practice

- How long was the time horizon for this project?
- Could you describe different phases of the project like planning phase etc.?
- How long was the management involved in the planning phase?
- How did it track the ongoing development, how often did it interfere?
- Which coordination, integration tools were used?
- How were the teams composed?
- How were the employees motivated?
- Was the project conducted in a routinized manner?
- Does the firm have institutionalized concepts for project management?
- Where did most of the problems occur?
- Where the major problems stemming from the influence of the core capabilities?
- Was there a special situation created in the organization (kind of leeway that supported the project?
- Was the project supported from the other departments?

4) INTERFERENCES of DEVELOPMENT PROJECTS AND THE CORE–CAPABILITIES (SUBDIMENSIONS)

- How would you estimate the influnece of your core-processes on the project?
- Which part supported /hindered the initiation?

5) ORGANISATIONAL CHANGES AFTER THE PROJECT

- Could you please describe the short-term / long-term effects after the project?
- Was there an improvement of firm performance?
- Was there a change in firms organization structure?
- Was there a change in the firms culture?
- Was there a change in the firms strategic orientation?

The Level-I questions were complemented by a structured questionnaire which was handed out during the interviews considering the following issues:

- **"Intrapreneurial Pattern: Intrapreneurship Assessment Instrument"**
- **"Communication Channel Continuum"**
- **"Estimation of Competitive Advantage"**
- **"Core-Capabilities and Resources"**
- **"Assessing the Development of Competence/Core-capabilities after Project Completion"**

4.6.2 Level-II Questions:

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1) GENERAL INFORMATION OF THE FIRM

a) The Organization Structure

- History of the firm / development path

b) *The Organizations Visions*

- Degree of operationalization of short-term / long-term visions
- Communication methods through all hierarchies

c) *The Organizational Strategy*

- Corporate management strategy

d) *The Strategic Context for Projects / Intrapreneurship*

- General firm culture
- Type of strategic context for entrepreneurship
- Intrapreneurship applied for which kind of projects
- Strategic deviation from normal corporate strategy
- Success/failure of intrapreneurial strategies
- Exploitation/transformation of intrapreneurial outcomes into firm performance

e) *Character of the Industry Sector*

- Ambiguous/unambiguous strategic planning
- Character of the capabilities and resources: asset-based / knowledge-based
- Development is technology-driven / driven by customer demand ; product-oriented / service-oriented
- Frequency of crucial changes / continuous improvements

f) *Competitors*

- Scale of competition: broad scale / focused market /internationality
- Main characteristics (business; core-capabilities; products)
- Method used for the identification of performance differences (for example Benchmarking)

2) CORE-CAPABILITIES

- Core-capabilities (4-types selection)
- At which stage of the consensus building process
- Effective mechanisms for development (i.e. incomplete markets/internal development/alliances, networking
- The core-rigidities of the organization
- Key products / services / product-life-cycle / value chain
- Development path of the firm regarding core-capabilities

3) DEVELOPMENT PROJECTS (PRODUCT / PROCESS)

a) *Strategic Context*

- Description of recently conducted or ongoing development projects (e.g. the initialization of a new working process / the development of a new product)
- Type of project (standardized/experimental) and its relation to the core-capabilities (based on which subdimensions)
- General data of the project (who initiated and took part; where was it performed; how long etc.)

- What was the reason for it’s initialization (-Performance Gap /-Customers Need /-Development program)

b) *Management practice*

- Project planning (time horizon, operationalized vision (commonly developed or induced)
- Which was the role of the corporate management with which kind of participation
- Which coordination planning (resource-allocation, team coordination, reorganization)
- Development of the context for incongruent projects
- Developing of team-spirit and/or motivating potential
- Coordination of the various initialization steps (existing routines?)

4) INTERFERENCES of DEVELOPMENT PROJECTS AND THE CORE–CAPABILITIES (SUBDIMENSIONS)

- Which of the core-capabilities dimensions or routines hindered the initiation

Involved departments where the core-capability is built

Core-Capabilities Subdimensions	i.e. Marketing	i.e. Production	i.e. R&D
Technology	Influence on Project?	Influence On Project?	Influence On Project?
Skills	Influence on Project?	.....	.....
Management	.....	.....	.....
Values / Culture	.....	.....	.....

5) ORGANISATIONAL CHANGES AFTER THE PROJECT

- Improvement of firm performance
- Development of core-capabilities (new routines?)
- Change in firm structure
- Change in firm culture
- Change in strategic orientation

CHAPTER 5: CASE-STUDY CARMEDIA

5.1 General Information: The Historical Development Path

The development path of CARMEDIA[37] is strongly linked to the historical development of its mother firm CR-TRONIC. Including CR-TRONIC partly into our focus, it could be described as an incumbent German electronic firm, founded in Berlin in the 1920th . The firm started with the production of headphones and is nowadays a major producer of high quality car-radios.

The original strategy of CR-TRONIC was already focused on a high-quality product standard. To maintain this quality standard, the corporate management created an effective control mechanism[38] that continuously developed into a recognized and appreciated trademark.

In the 1930th, CR-TRONIC enlarged its product focus and concentrated its activities also on the development of sound systems for cars and its engineers introduced the first car-radio in Europe. At that time, the product developer had to overcome the problem of the enormous need for installation space (in that case of 10 liters). But, these problem-solving activities laid the fundament of CR-TRONIC's competencies:

- Miniaturization of electronic components
- Integration of various attributes
- Innovativeness of technical solutions

At that time, a car-radio costed a third of the total price of a small car. In 1969, CR-TRONIC produced the first stereo car radio in the world with an integrated cassette player. Meanwhile, the installation space was reduced to only one liter. In the 1970th the CR-TRONIC product developer integrated more and more technical features into the car radio. Supported from the radio stations providing a radio traffic information system, CR-TRONIC introduced the first radio receiver offering that service. In 1980, the engineers developed the first full car radio/cassette combination with a microcomputer, digital fine tuning and a frequency display. In 1983, the firm developed the first car radio with radio station identification facility.

[37] Name of both organizations changed, due to disclosure agreements.

[38] After checking and testing of each pair of the produced headphones, they had been marked with a special sign. After some time, CR-TRONIC's customers began to ask especially for such marked headphones. Increasingly, the symbol of quality became the trade mark, and in the 1930th the company name was renamed after this trade mark.

Nowadays, the development of digital sound sources has become the strategic direction of CR-TRONIC The prototype of the first CD player designed for in-car installation was introduced. The product developer built on the corporate strength and integrated the CD player with the car radio in a very small format and with the most advanced technology available. In 1988, the firm developed the first CD-player/changer combination.

The development went on and focused especially on the further enhancement of the Digital Audio Broadcasting (DAB) technologies. For that purpose CR-TRONIC founded the spin-off CARMEDIA. CARMEDIA has currently around 500 employees organized in teams with flat hierarchies. The teams are engaged to invent and construct new technologies for DAB transmissions. One interesting fact is it's independence from the mother firm. It is empowered to sell it's research outcomes even to competitors of CR-TRONIC. But in the normal case, it offers it's products to the mother firm.

If we follow the development path of CR-TRONIC, it always has been a very innovative organization. We will describe in the appendix of this case-study a process model invented by CR-TRONIC to shorten product development times. Such techniques for shortening development times are based on a consistent, holistic approach to system design and the use of development tools with integrated simulation techniques.

As our interview partner described, a lot of CR-TRONICS management practice and organizational values have been transmitted to CARMEDIA where they should support the new projects.

5.2 Corporate Management Strategy

CARMEDIA takes part in several European research programs together with other high-tech firms, but there are no deep alliances undergone to protect the own know-how and knowledge base. This kind of strategic behavior leads sometimes to a shortage in an appropriate workforce and makes it necessary to hire temporary workers with fixed-term contracts. Such workers have to sign "disclosure agreements" to mitigate the knowledge diffusion to other firms. The management tries to oblige them to the firm for a longer period after the project.

The developed long-term vision of CARMEDIA's corporate managers was that such a DAB system wouldn't have a real chance on the market unless it offered more than the currently available RDS System. Therefore, the strategic focus had been enlarged to:

- Telecommunication
- Multimedia

Two years after these interviews, we can find a broad product portfolio based on that strategic technology. One important attribute of CARMEDIA's products is their ***innovativeness.*** They are as smallest as they could be, with low energy consumption, and more product features than those of the competitors. To achieve the smaller size, the engineers are developing chips with smaller numbers of pins assembled on smaller platines.

But as our interview partner described, at the moment CARMEDIA does not use any strategic instruments to investigate performance differences to it's competitors like benchmarking of best practice, etc.

Together with the high-quality standard CARMEDIA's corporate management applies also a low cost strategy achieved with the help of a efficient construction- and production mode. As a self estimation, CARMEDIA's strategies are evaluated as being more efficient than those of it's competitors.

5.3 Organizational Context

5.3.1 Strategic Context for Intrapreneurship Culture

The structure of the organization may be described as very open and fostering entrepreneurial initiatives. It matches to a great amount all attributes of our first constructed entrepreneurial pattern:[39]

Table 5.1: ***Constructed Pattern for Intrapreneurial Context at CARMEDIA***

	Assessment
A more open, trusting organizational Culture	**Strongly agree**
Failure allowed	**To a small extend**
Less Bureaucracy	**Strongly agree**
Frequent use of cross-departmental Teams	**Agree**
Use of empowered Teams	**Strongly agree**
Increased Employee Involvement in Design and Planning	**Strongly agree**
A more active Employee Suggestion System	**Strongly Agree**
Increased Employee Autonomy in Decision Making	**Srongly agree**
Increased Employee Interaction with Customers and Suppliers	**Disagree**

The corporate management is supporting directly intrapreneurial activities. For example, one team, consisting of five developers had been further "spinned-off" and is working now independently and "highly motivated" [original interviewee comment] as an external supplier for CARMEDIA.

This context has a certain tolerance for failures in the first line for the EU-projects. Here, due to bad coordination with other firms, more of the projects failed. But for in-house projects, there is more pressure for success. These projects have a lower/minimal failure tolerance.

The team members remain the whole time with the project. They have personal freedom in decision making with regard to their current actions and working hours. They are empowered within limits for problem solving decisions, if their solutions could be integrated into the development process. The status and recognition of the project members within the organization is high. There exists no hierarchy within the team. There is one project manager but without line-authority to instruct the others. He

[39] This first assessment of the strategic context will be further developed within the second case-study with an advanced intrapreneurial pattern.

is "only" responsible for the coordination with other teams and for the reports to the division manager. On the average, the team members are relative young.

In general, there are no monetary incentives provided like special payments or incentives for team-work or innovations. This is due to the fact that team/project work is planned as the normal collaborative form at CARMEDIA. After the project, there exists the chance to accompanying the project at the client's site and to become the main responsible manager for all issues. Besides that, there are no further possibilities to "make career" after the project is successfully finished.

5.3.2 Firm Characteristic according to the "Four Type" Model

Following **Miles** & **Snow** 's (1978) typology, CARMEDIA has in the first line characteristic traits of the so-called "prospector" type:

Table 5.2: ***CARMEDIA: Characterization of Strategic Behavior***

	Very Low Degree	Low Degree	Neutral	Notable Degree	Very High Degree
Defender					
Prospector					X
Reactor					
Analyzer					

As **Burgelmann** describes, firms of the "prospector" type are highly concerned with new opportunities experimenting constantly with potential responses to emerging environmental trends. For this purpose their emphasis on "autonomous" strategic behavior is very high. Therefore, those firms need a strategic context that enables autonomous thinking and acting.

5.3.3 Intra Firm Communication

As our interview partner points out, within CARMEDIA exists a high level of intra firm communication. Besides the email communication that could be seen as standard way, there are several large and small group face- to-face meetings. It is foreseen that every Monday morning the single teams should meet to discuss operational problems. Once a month, the complete employee staff comes together to be informed about the strategic course, to discuss and evaluate the status quo and to be informed about the future steps.

5.4 The Economic Environment: The Description of the Industry Sector

CARMEDIA operates in an approximately 10 years old high-tech industry sector. As our interview partner estimated, a major change of the "key" technology occurs every five years. Crucial improvements of this technology with new product portfolios come up every two years. Therfore, the approximate value of any new know-how will last between one and two years until it diffuses into common available knowledge. The direction of any development in that industry is described as being very ambiguous.

CARMEDIA will compete on a focused market while the entry barriers to this market are estimated as very high and cost intensive. There is also a high dependency from radio stations, licence agreements and car manufacturers. This market is technology-driven and becomes more and more international. CARMEDIA sees this international challenge as an advantage against his main competitor (who has a more "bureaucratic" structure and older R&D facilities).

5.5 Consensus Building on Core-Capabilities / Clarifying of Competitive Advantage

5.5.1 Competitive Advantage of Products / Services

If we use **Hall**'s analytic framework, we have to consider the following product/service attributes:

```
Price.................................20%
Quality...............................%
Functionality.........................%
Aesthetics............................%
Availability..........................%
Image.................................10%
After Sales Service...................%
Innovation............................70%
Customer Convenience..................%

=100
```

As the ratings show, the competitive advantage of CARMEDIA's products is based on the following attributes: Image 10%, Price 20%, Innovativeness 70%

According to our interview partner, CARMEDIA'S "key"-attribute "innovativeness" is achieved by:

- Motivated researchers, such as young engineers directly from universities with new ideas
- At least 5 years of accumulated firm know-how on this sector
- The firm's product portfolio that is based on the latest chip developments and its respective applications

Difficulty for a competitor to imitate those resources:

[Personal ratings of the interview partner]

-Reputation of Products: possible

-Reputation of Company: difficult

-Skills of employees: difficult but possible

5.5.2. Core-Capabilities and Resources out of which the Core-Capabilities are built

CARMEDIA's core-capabilities integrate the production know-how and technology of:

- Miniaturization of technology
- Integration of various components
- Innovativeness of product attributes

The core-capability could be described as the capability to provide the customer with state-of-the-art products combining innovative features using extremly minimized installation space. The corporate management and all hierarchies are well aware of the core-capabilities described above. The consensus on these core-capabilities was built during a continuous evolutional process. It is updated and communicated through monthly meetings and the everyday team experience.

Table 5.3: ***Categories of Resources that are building CARMEDIAs Core-Capabilities***

Resource Category (detailed in Appendix):	Percentage:
Regulatory Resources: ***-Business Secrets*** ***-Patents*** ***-Contracts***	15%
Positional Resources: ***-Accumulated Data*** ***-Reputation of Company / Products***	35%
Functional Resources: ***-Skills of Employees*** ***-Skills of Partners***	25%

Organizational Capabilities:	
-Capability to develop high Quality Standards	25%
-Capability to innovate	
-Capability to work with Teams	
-Learning Organization	
-Entrepreneurial Climate	

Dimensions of the Core Capabilities need most of the firms resources:

Functional Resources like i.e. skills development: 75%

Establishing Culture: 25% [40]

5.6 Development Projects BLUECHIP-9597; BLUECHIP-9799

5.6.1 Project Management Practice

As described during our field interview, on the average, every 1 ½ - 2 years, a new project is going to be launched. In general, the impetus comes from within the R&D department. Here, the projects are to a high extend initiated from an upper hierarchical level or a corporate manager. Due to the empowering "course" of the firm, everybody is supported in suggesting projects. For this purpose, the corporate management has provided a strategic context, where all issues around projects have a very high status.

The development team is formed on a continual basis for approximately five years while the team members are working for no other projects during that time. There are no special development programs foreseen to enhance the team-skills, but the team members gain experience by "learning by doing". Among all projects, 15% could be described as "experimental". Additionally, everyone has the opportunity to follow his/her ideas if they seem to be of certain importance for a new development. For this purpose, every team member has free resources (10-20% of the contractual working time).

[40] According to the interviewee, the plans to establish a cross-departmental culture could not be reached in total, but people have learned to work within teams and understand each others needs.

According to our interview partner, among all projects with "experimental" status, 5% are resulting in applicable product innovations. The initialization of the other more congruent projects could be described as to 85% as "expected" or so to speak as successful. CARMEDIA is undergoing common projects within the European Union and from those projects 70% could be described as successful. As our interview partner described, the lower success rate may be due to coordinative problems with the partner firms.

With regard to the conceptualization of the projects, in general, the theoretical phase lasts 2-3 months while all crucial strategic decisions are made during the first month. The project time in total is calculated with two years.

Focussing on the development practice, CARMEDIA is continuously developing its project culture and introduced institutionalized procedures and guidelines for project initializations. Those procedures cover:

- Project proposal
- Project application
- Project introduction
- Project administration

As already described, it is foreseen, that once a month, the employees from the whole department come together to discuss the strategic course and to plan future steps in the respective projects. The single teams meet on a weekly basis (mostly Monday morning). Every team member has a high freedom of decision making, but he/she has to provide a solution at the end that goes align with the project. According to the interviewee, the reasons for the good success rate are:

- Good team communication
- Good know-how transfer within the team
- Flat hierarchy

5.6.2 The Development Project "BLUECHIP-9597"

As we described before, the project target was to develop a chip that could link and integrate the Digital Audio Broadcasting technology into the car-radio technology. As there was the firm reputation being always a step ahead introducing new technologies into the markets, the teams faced the challenge to succeed also in this case. Regarding the project conduction in a retrospective way, it did not differ from the normal parameters for project development at CARMEDIA. The time frame was set for

two years, the financial support was within the normal limits and the teams had been designed in the "usual" way, described above.

5.6.2.1 The Underlying Technology: Digital Audio Broadcasting (DAB)

This state of the art technology allows radio broadcasting on a digital basis. The start-up of it's usage took place in Germany during the IFA (Internationale Funk-Ausstellung) in 1997. In Sweden, it is already used since 1996. Also in England, where at the end of 1995, 25% of the population was able to use DAB. Other countries will follow as well. The development of DAB began in 1985, bringing forward the vision to gradually replace analogue radio with digital radio broadcasts in CD quality.

Other Digital Audio Broadcasting advantages include:

- Interference-free reception in cars, trains etc.
- Frequency-saving operations possible through a single-frequency network [41]
- Reduced transmission power saving energy (Factor 10 to 100)

As already noted, the developed vision of the project was that such a system wouldn't have a real chance on the market unless it would offer more features than the currently available RDS System. The engineers and product developers were assessing that DAB would have the potential to be more than just a medium for the transmission of digital radio as planned today. DAB may be used for flexible data transmission at a bit rate of up to 1,7 Mbits/sec (1,7 million bits per second). Using this data rate allows to transmit not only audio programs but text, images and data at the same time. For the car-driver, this means that s/he can see additionally a road map on which the areas of traffic problems are highlighted while the traffic message is being broadcasted.

As it was described in a marketing prospect, for further usage, DAB makes it possible to address a fax message to any number of recipients and transmit it in just a few seconds. All that is required is a PC with a DAB plug-in card and a fax program. As a result, DAB is no longer just "only" digital radio, but rather a multimedia system which is to become popular with the users in the home, on the road, on trains or in the office. Completely new terminal equipment for such multimedia applications as electronic newspapers, current bus or train timetables, still picture reception and TV broadcasts will open up new markets and shape the future. A variety of practical tests are taking place in the field in the majority of European countries. In Germany, Digital Audio Broadcasting is being used by more than 30 radio stations, most of which began with providing regular service in 1997.

[41] In this case, all radio stations use the same frequency for their broadcasts

5.6.2.2 Interrelationship of the BLUECHIP-9597 Project and the Core-Capabilities (Subdimensions)

The BLUECHIP-9597 project could be categorized as being incongruent with the current capabilities and competencies. CARMEDIA was not very familiar with real chip design. It had no own processes established for the chip creation and there was also no accumulated know-how on the side of the team members. All experience and knowledge was restricted to the development of a high technology "black box" in the 90th, but that experience was not very helpful for the design of a state of the art chip.

We will describe some consequences of that incongruence considering the interactions of the project initialization process with the respective subdimensions of the core-capabilities:

Subdimensions Technology / Skills:

As we already mentioned above, the project was not supported by the technical dimension of the core-capabilities because there wasn't any established technology for the production of a chip. But, this in the first view crucial obstacle could be mitigated. First, the design process was conducted on a virtual theoretical level with the help of Computer aided design programs (CAD). Later, the basic technology for the real chip-production was bought form another firm. Through that circumstance, there was no supportive influence from the "skill-dimension". Another problem was the missing knowledge and training of the employees. Besides the missing technology, there was no know-how of how to design a chip at the beginning of the project. Everybody had to gather the necessary knowledge on his/her own learning activities. For that purpose, the team members had been empowered within broad limits. The corporate management prescribed the wanted features of the chip to the development groups, but the way how to integrate all the functions into the chip was not determined and depended on the own planning effort and activities of the team.

Subdimension Management Practice and Values:

The corporate management did not encounter major difficulties, because of the fact that the supporting climate/values and the experience to work with teams had already been established to some extend. It was accompanied by a clear formulated and operationalized vision/project goal. There was also an awareness of all team members of the current organizational competencies, but also of the technology- and skill shortcomings. Overall, there was the management challenge that a positive result was a must. The target was given, but the personal freedom in decision making was relative high compared to other teams.

5.6.3 Follow-up Project: The Development of BLUECHIP-9799

The BLUECHIP-9799 design could be described as a "follow-up" project of BLUECHIP-9597. The target was to advance the technology feature and improve the chip design. As the testing phase of BLUECHIP95-97 was rather short, some functional shortcomings had been detected only afterwards. To correct these failures, additional circuits had to be designed around the single chip which increased the size of the circuit platines to some extend. All those technologies should now be reintegrated into the new Chip-9799 to make it more compact. Meanwhile, the necessary routines had been created, and know-how and experience for the chip design and testing processes have been accumulated as well. The team arrangement and development procedure remained still the same.

5.6.3.1 Interrelationship of Development Project and Core-Capabilities

Subdimension Technology / Skills:

As we already mentioned above, the project was supported by the technical /skill dimension build up from the former project. The technology that was additionally bought was well adapted. The general problem concerning any development of a chip architecture is that there is no second chance. That means that if the chip once is designed there is no way for further improvement or failure correction inside the chip. The product developer has only the possibility to arrange additional electronic elements and circuits around the chip to improve it's functionality. Therefore, a broad testing and theoretical simulation is necessary to prevent the chip from fail functions. Much of the problems of the first project resulted from an underestimation of the testing phase. The product developer had to spend a lot of efforts to correct the male functions afterwards. But during the BLUECHIP-9799 follow-up project, the institutionalized test procedure lead to an "over"-testing. The team members felt an enormous time pressure at the nearing end, because they spent so much time with testing even neglectable issues.

Subdimension Management Practice and Values:

The corporate management gave the impetus also for this follow-up project and provided the context and empowerment for it's initialization. But, different from the first project, the team members didn't feel the challenge that existed during the first project, because the chip-design was now conducted in an already routinized manner ("there was no fun.....", [original comment]). Therefore, the team members needed more motivation to work additional hours, engaging in ownstanding research for improvements etc.

5.7 Experience from the Project

5.7.1 Main Failure

Project BLUECHIP-9597: According to our interview partner, one critical experience was that the period for simulation and testing had been calculated too shortly. There had been several chip failures detected, but it was too late for a new chip design. For that reason, additional electronic supplements around the original chip had to be designed to fulfill the tasks that the defective core chip wasn't able to do. This affected directly the core-capability, as they were now unable to offer a compact product.

Another potential shortcoming could have been the fact that the trigger for the project did not result from a customer relationship management. It was a technology driven project, where the corporate management relied on the fact that in the organizations history all developed products found their customers. So far, there was no feedback from the marketing department. In a retrospective view we can prove that the decision was right, but nevertheless it beard a potential for a negative outcome.

While there was an underdeveloped testing phase during the BLUECHIP-9597, now the development team exaggerated in the other direction and tested too long in the second project, which brought the teams in time problems.

5.7.2 Activities at the Project-Level that could be transformed to enhance the Firm’s Competitive Advantage / Core-Capabilities

Project BLUECHIP-9597: According to our interview partner, this project was a crucial contribution to the organizational project development routines. It contributed to the development of an institutional way of how to design and carry out project work. That includes:

- How to make proposals
- How to administrate a project
- How to apply for resources
- How to present a project

During that project, the team learned how to design a chip process. This new routines are the basis for many future projects and thus contribute to the sustainable competitive advantage. It also enables the firm to follow up with its competitors. Additionally, the team culture improved.

Project BLUECHIP-9799:

- The routinized design process of a chip had been further advanced
- Team culture further improved
- Governmental allowance for broadcast was achieved

5.7.3 A Retrospective View: General Impact of Development Project on Firm Performance

5.7.3.1 The Impact of Development Project on Target Fulfillment / Firm Performance

Table 5.4**:** ***The Impact of Project BLUECHIP-9597 on Firm Performance***

	Assessment
The Project increased the Organization's Productivity	Strongly agree
The Project increased the Organization's Competitive Position	Strongly agree
The Project increased the Organization's Profitability	No Evaluation Possible
The Project increased the Organization's Revenues	No Evaluation Possible
The Project increased the Organization's overall Performance	Strongly agree
The Project had a negative Influence on our Productivity	Disagree
We would have been better without this Project	Strongly disagree

According to the respondent, the project increased to a high amount:

- the organization's productivity,
- the competitive position, and
- the overall performance

With regard to the revenues or profitability increases, there was no evaluation possible, because of pre-production state of the product and the missing customers. According to our interview partner, this project was a crucial contribution to the organizational project development routines.

The project contributed to the development of an institutional way of how to design and carry out project work, encompassing :

- how to make proposals
- how to administrate a project
- how to apply for resources
- how to present a project

During the *BLUECHIP-9799* project, the team learned how to develop a chip design. In a retrospective view, these new routines had been the basis for many future projects and thus were contributing critically to the sustainable competitive advantage.

Table 5.5**:** ***The Impact of Project BLUECHIP-9799 on Firm Performance***

	Assessment
The Project increased the Organization's Productivity	Agree
The Project increased the Organization's Competitive Position	Agree
The Project increased the Organization's Profitability	No Evaluation Possible
The Project increased the Organization's Revenues	No Evaluation Possible
The Project increased the Organization's overall Performance	Agree
The Project had a negative Influence on our Productivity	Disagree
We would have been better without this Project	Disagree

The empirical results highlighted that the project increased on a lower amount than the former project:

- The organization's productivity.
- The competitive position.
- The overall performance.

Moreover,

- The routinized design process of a chip had been further advanced
- Team culture further improved
- Governmental allowance for broadcast was achieved

There is still no evaluation in terms of revenues and profitability possible.

5.7.3.2 Impact of Development Project on Organizational Culture and Structure*:*

Both projects did not influence or change the organizational culture and structure dramatically, because there was already a strategic context created to support any kind of projects. Summarizing, we could say that the projects helped to enlarge he know-how and performance, but they did not change the project structure and culture. That also means that it is foreseen that any future project will be carried out following the current rules.

5.8 EXKURS: **General Development Concept of CR-TRONIC Reducing Development Time**

"***Speeding Up System Development***"

As we could find on the internet homepage, the "key" techniques for shortening development times at CR-TRONIC are based on a consistent, ***holistic*** approach to system design and the use of development tools which encompass also simulation techniques.

As it is argued, the operational reliability and functionality of new products must meet more and more specific customer demands. At the same time, the various system components of a product are becoming increasingly interlinked. Consequently, it is no longer possible to develop and optimize the system components separately. After the components have been combined, the overall system must be tested to determine whether the requirements and specifications have been met. As it is mentioned, consequently, the early phases of a development process are of increasing importance. Their share of the total development timee is increasing substantially. Consequently managed, it will lead to a reduction in errors. For this purpose, product development teams are in need for detailed and complete specifications, including functional models for the use in system simulations to excludes the need for a redesign.

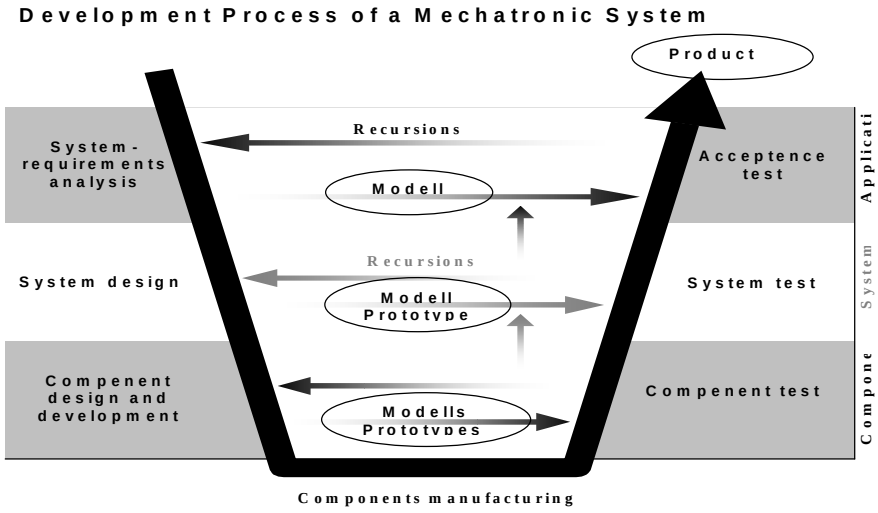
As it is described, for the further alignment of the development of more and more complex systems, CR-TRONIC is focussing on the following subjects in its research and development areas:

- Methods of improved system analysis and system specification, along with the pertinent quality criteria and verification tools
- Modeling and simulation methods for holistic system design
- Tools for abstraction and system reduction, including the required functional description languages for components and subsystems

- Analytical methods suitable for hardware-software partitioning and co-design, with decision criteria such as cost, time, feasibility, applicability.
- Consistent product data management throughout the entire life cycle. Here, in addition to access throughout the company, customer access must also be provided.

One outcome is the so-called "V-model", a process model for the efficient time saving development of complex products. With this model, the research and development functions at CR-TRONIC should be prepared to meet both present and future requirements.

Figure 5.1: ***The V-Model: A Process Model for the Efficient Development of Complex Products:***



As it is explained, the "V-model" intertwines the interrelations of the various development phases of the product creation, beginning from the requirement analysis, followed by the detailed design phase to manufacturing, testing and system application. Within a holistic perspective, the different phases are horizontally as well as vertically interconnected. The different development tasks could be accelerated by the use of "recursions" on the respective design levels:

- Component level
- System level
- Application level

Product development includes also the application systems and component levels. Here simulations, rapid prototyping and concurrent engineering should support an earlier verification of the test models.

5.9 Appendix: Questionnaires

1) Out of which resources and competencies are your firm's core-capabilities built?

	1 . Category Regulatory resources protectable in law:	**2. Category Positional resources Due to previous endeavor:**	
35% 40% 25%	• Contracts • Licenses • Patents • Copyright • Trademarks • Registered designs • Trade Secrets.	• Data bases • Reputation of products/service • Reputation of company • Value Chain configuration • Established distribution network • Others:	30% 30% 30% 10%
100%			100%
	3. Category Functional resources due to skills & experience:	**4. Category Cultural capabilities of the organization:**	
80% 10% 10%	• Know-how and experience of employees • Know-how and experience of suppliers • Know-how and experience of franchisors /partners • Know-how and experience of customers • Others	• Ability to develop a high level of quality standards • Ability to develop a high level of service standards • Ability to manage change • Ability to innovate • Ability to assess the competition • Ability to work with teams • Participative management style • Learning organization • Ability to provide entrepreneurial climate • Others	20% 20% 20% 20% 20%
100%			100%

Core-capability profile:15%(Category 1) + 35%(C2) + 25%(C3) + 25%(C4)

2) The Evaluation of Project Influence on the overall Development of the Firm

a) Project "BLUECHIP-9597": The Contribution of the Project to the Firm's Success / Development of Competence

	Assessment
The Project increased the Organization's Productivity	Strongly agree
The Project increased the Organization's Competitive Position	Strongly agree
The Project increased the Organization's Profitability	No Evaluation possible
The Project increased the Organization's Revenues	No Evaluation possible
The Project increased the Organization's overall Performance	Strongly agree
The Project had a negative Influence on our Productivity	Disagree
We would have been better without this Project	Strongly disagree

b) Project "BLUECHIP-9799": The Contribution of the Project to the Firm's Success / Development of Competence

	Bewertung
The Project increased the Organization's Productivity	Agree
The Project increased the Organization's Competitive Position	Agree
The Project increased the Organization's Profitability	No Evaluation possible
The Project increased the Organization's Revenues	No Evaluation possible
The Project increased the Organization's overall Performance	Agree
The Project had a negative Influence on our Productivity	Disagree
We would have been better without this Project	Disagree

CHAPTER 6: CASE-STUDY RECEIVE-TECHNOLOGIES

6.1 General Information: The "Competence Center" of RECEIVE-TECHNOLOGIES

RECEIVE-TECHNOLOGIES is one of five high-tech business units of a German concern with a workforce of approximately 400 employees in Ulm (South Germany), 100 in Friedrichshafen, 70 in Kiel and 20 in Wilhelmshafen. Additionally, it has so-called "project departments" in Flensburg (North Germany), Köln, and Bonn.

Our investigation focuses especially on the so-called "Competence Center" of RECEIVE-TECHNOLOGIES, a high-tech development department. The core-technology of RECEIVE-TECHNOLOGIES which is now continuously improved in this competence center was developed from an one man business start-up 10 years ago. This small enterprise was integrated into the competence center and is consisting meanwhile out of a group of 50 engineers and technicians under the leadership of the former entrepreneur. Unfortunately, we are not allowed to describe more general firm details together with the project information, because of the confidence/disclosure agreement we had to give before we made the interview. Analyzing this competence center gives us on the one hand insight into the firm's project management practice, on the other hand it allows us to study the established entrepreneurial context.

RECEIVE-TECHNOLOGIES has established itself very well on the national and international market for "receiver" technology. It operates frequently within a collaboration of international joint ventures and European projects.

The main business of RECEIVE-TECHNOLOGIES encompasses:

- The building of high quality receivers with a broad frequency spectrum,
- The conception of system solutions for receiver technology and derivated applications, (i.e. radar-technology for ships, satellite-navigation system , mobile communication technology, etc.)

With the help of the local project departments, its customer relations should be facilitated and maintained, even over a longer distance. The customers should receive a fast and flexible support service. As it was described, the teams were operating the last years "at the edge" of the state-of-the-art technology. The teams were developing key-technologies from first prototypes on the way to mass production. In 1991, the first prototype was presented. Meanwhile, more than 1000 receiver modules were produced and a taskforce of engineers and technicians are permanently planning and improving

the structures for a more and more efficient competitive low-cost production for the respective electronic components.

For this purpose, RECEIVE-TECHNOLOGIES developed its own foundry for an efficient production of the so-called GaAs[42] components. This foundry should make it possible to produce receiver modules in high quantities at competitive prices. The manufacturing takes place in so-called "Clean-Rooms" according to the highest standards. The spectrum of the various task and services within the competence center encompasses:

- The design and development of electronic circuits according to customer requirements
- The development of algorithms and hardware for fast signal processing systems
- The coordination of prototype and pilot series production
- The design of electronic circuits with optimized production processes and test routines.

All these services are summarized under the so-called "M5-Service": Microwave / Milli-Meterwave Module Engineering, Manufacturing & Service.

6.2 Corporate Management Strategy

In order to achieve a leading role in this market and also to expand it's international perspective, the corporate management is focussing intensively on two issues:

- International competition
- Mass production of state-of-the-art electronic components

Internal market research brought out that there will be a future demand worldwide for these kind of products, because of their enormous adaptability. The receiver modules are providing a compatibility to various technological "platforms" and different usage for example in a combination of GPS[43] technology and mobile telephone, car-distance-control-system, satellites observation etc.. But the management is aware that only the continuous development of the core-capabilities will enable the firm to stay at this "edge" of the state-of-the-art technology. As our interview partner explains, for this purpose, all new know-how, acquired from different sources, will be directly applied into the ongoing product optimization cycle.[44]

[42] GaAs: Gallium Arsenid Material
[43] GPS: Global Positioning System: Orientation/Navigation System based on Satellites
[44] The most rational production steps are planned in close cooperation with the customer.

With regard to RECEIVE-TECHNOLOGIES organizational structure and working practice, there are several crucial changes planned within a long term horizon:

- There will be a change from unique customer-focused, cost-intensive product development strategy towards mass production.
- The organization structure will be changed from a functional structure [so-called “Fachstruktur"] towards a team structure.
- There will be an enhanced focus on the core-competencies and capabilities. This also means that not all of the components should be developed and produced in-house in an own development process. For this purpose, the firm is seeking for appropriate suppliers and strategic alliances with the semiconductor or telecommunications industry
- The corporate management plans also the introduction of institutionalized project development processes with rules and guidelines that prescribe how to develop effectively a product.

6.3 Organizational Context

6.3.1 Strategic Context for Intrapreneurship Culture

Similar to our CARMEDIA case-study, we asked our interview partner for an assessment of the currently existing intrapreneurial attributes. Through ongoing literature research, we found a more elaborated assessment instrument than we used before, developed by **Kuratko** *et al.*(1990), which we now applied for this case-study. After the interview, we arranged/summarized these statements under the different subpatterns below and double-checked it with the respondents, by sending it back by post.

Table 6.1: ***Advanced Intrapreneurial Pattern: Intrapreneurship Assessment Instrument***

Subpattern 1: Management Support for Intrapreneurship	**Assessment/Comment**
17.Senior managers encourages bending rules	**At the moment, the senior manager are supporting more the working processes according to the new institutionalized rules.**
18.Corporate management has experience with innovation	**Yes, the corporate management was always concerned with state-of-the-art technologies.**
19.Management encourages for activities	**Yes, i.e. former entrepreneurship program.**
20.Corporate management makes sponsorship	**Yes, special budget.**
21.Individual risk-takers are often recognized whether eventually successful or not	**In general, quality of project leaders and their influence on project recognized.**
22.Encouragement for calculated risk	**More encouragement to stick to the process.**
23.Small and experimental projects are supported	**There was more support in the past for experimental projects, but it still exists**
24."Risk-Taker" is considered a positive attribute	**-Missing answer**

Comment to Subpattern 1:

As our interview partner described, in the past, the corporate management supported the development of the intrapreneurial culture with special intrapreneurial programs. But, a major problem that occurred was that the outcomes could not be integrated and did not effectively improve the firm performance. According to our respondent, one reason was that neither the core-competences nor the visions and targets had been clearly operationalized. This was one of the reasons, why the corporate management started these consensus-building activities on the first three levels.

Subpattern 2: Organizational Structure	Assessment
25.Second Changes after Mistakes	Yes
26.Mistakes as Learning Experiences	Yes
27.Important to look busy	No
28.Difficult to form Teams	No
29.Concern for Job Descriptions	To a certain extend
30.Defining Turf is important	To a certain extent

Comment Subpattern 2:

Through this organizational change, the situation could be described as two-folded. On the one hand, new teams were built, composed out of representatives of all participating departments. The team was relocated in a separate department and the team mebers got new jobroles. One the other side, this new development process was initiated and is hindering to a certain extent the personal freedom of the employees decision making. Now, the management is challenged to find the balance to use both, the creative influnece of the team structure and the "guiding" influence of the more institutionalized development process.

Subpattern 3: Reward and Research Availability	Assessment
31.Availability of funds	Yes
32.Problems with company budgeting process	No
33.Additional rewards / compensation	Normal compensation by working additional hours. Some employees were hired as socalled "free-lancer" with attractive salaries, but on short-term contract.
34. Option for financial support	Yes
35.Problem solving with co-workers	Yes

Comment to Subpattern 3:

In terms of financing, there was a lot of support as the project was assessed to have strategic importance for the long-term firm performance. In general, financing experimental and other projects had never been a critical problem. On the one hand there were a lot of internal funds available, on the other hand, the customer agreed to pay not only at the time of the delivery, but everytime, when the team will meet an advanced development stage.

Complementary Questions	Assessment
37. An open, trusting organizational culture	Yes
39. Less bureaucracy	No, at the moment even more bureaucracy
40. Teams are isolated in a separate department	Yes
41. Frequent use of cross-departmental teams	At a starting point
42. Continuity of team taskforce during whole project (engineers, marketing, etc.)	Yes
43. Use of empowered teams	Yes
44. Increased employee involvement in design and planning	Yes
45. A more active employee suggestion system.	Yes
46. Increased employee autonomy in decision making	Neutral
47. Personal career linked with project	To some extend/older role still exists
48. Personal evaluation based on project success	Yes / to some extend
50. Increased employee interaction with customers and suppliers	Neutral

6.3.2 Fit with the "Four Type" Model

RECEIVE-TECHNOLOGIES former characteristics were matching mostly with the DEFENDER type, but the corporate management plans to change these characteristics towards the ANALYZER or the PROSPECTOR type.

Table 6.2: RECEIVE-TECHNOLOGIES ***Characterization of Strategic Behavior***

	Very Low Degree	Low Degree	Neutral	Notable Degree	Very High Degree
Defender				X	
Prospector					
Reactor					
Analyzer					

The firm did this crucial shift together with a re-organization from a functional- towards a project structure. Within that former organizational structure, the respective departments had a deep state-of-the-art knowledge to solve particular problems and kept those knowledge and experience over years. The management used the ongoing project as a tool for that organizational change. Impetus for this re-organization were the outcomes of a recent project assessment process that analyzed all the projects

that were conducted during the last years. The analysis highlighted that a lot of projects failed in terms of "time" and "cost".

6.3.3 Communication Tools applied within the Organization

Table 6.3: ***Communication Channels at RECEIVE-TECHNOLOGIES***

		Very Low Degree	Low Degree	Notable Degree	High Degree	Very High Degree
Rich Channels	***One-on-One / Face-to-Face Communications**				**X**	
	*** Hallway/Coffeepot Communications**				**X**	
	*** Small Group Meetings**				**X**	
	***Video Conferencing**	**x**				
	***Telephone Conversations**				**X**	
	*** Voice Mail**		**x**			
	*** E-mail**				**X**	
	*** Large Group Meetings**		**x**			
	*** Handwritten Personal Notes**		**X**			
	*** Advanced Copies of Agendas**		**?**			
	*** Faxes**		**x**			
	*** Interoffice Memos**		**X**			
	*** Formal Speeches**		**X**			
	***Letters**		**x**			
Lean Channel	***Reports**			**X**		

6.4 The Economic Environment: Characteristics of the Industry Sector

RECEIVE-TECHNOLOGIES originally operated in a high-tech industry sector that is existing for approximately 20 years. The technological development in this industry sector moved forward in the first line through continuous development than through radical changes. In general, the development projects are very complex and long lasting, and the products could be described as being more "niche" products than products for the mass market.

The products are very customer oriented. The customers can rely to receive up-to-date solutions, and for this value they were willing to pay accordingly. Since RECEIVE-TECHNOLOGIES often worked for the State of Germany, the product price had not been the first criteria, it was more the state of the art of its technology and its reliability.

Nowadays, since the overall market potential is declining, and also because of the decreasing demand from the public sector, there is the need to enter additional markets. For this purpose, RECEIVE-TECHNOLOGIES re-oriented recently its corporate strategy towards the telecommunication market with all its different attributes, like its ambiguity and mass-production character. For this reorientation, the corporate management plans to "update" its firm performance with the help of collaborative alliance partners from the new industry sector. At the moment, the organization plans new outsourcing processes for such mass production parts, because it has not yet the know-how and technology to build such parts in an economic and competitive way. But, according to our interview partner, the problem is that for potential partners from the telecommunication sector, RECEIVE-TECHNOLOGIES is not very attractive, because of its small scale production.

The firm operated originally in an international market that had some idiosyncrasies preventing strong competition. In this market there exists an international reglementation for collaboration. If a firm wins an order that was announced from the public sector, also its competitors get the chance to participate to a certain extend. The winning firm will carry out the administrative management and international coordination. As we will see later, originally, RECEIVE-TECHNOLOGIES did not win the order, but due to that reglement it could work on a sub-project. Here, its core-capabilities matched very well with the requirements.

Due to that strategic reorientation, the firm is confronted with new competitors that are well experienced in the telecommunication mass market. As the corporate management evaluated, the only way to survive is to mix the new and old competencies and to find again a niche.

6.5 Consensus Building on Core-Capabilities and Competitive Advantage

6.5.1 Competitive Advantage of Products / Services

Also in this case-study, we use **Hall**'s analytic framework, and consider the following product/service attributes that enable RECEIVE TECHNOLOGIES competitive advantage:

```
Price.....................................%
Quality..................................20.%
Functionality............................20.%
Aesthetics...............................%
Availability.............................%
Image....................................%
Service..................................20.%
Innovation...............................20.%
Customer Convenience.....................20.%

=100
```

Which Attributes could be imitated?

The competitive advantage of RECEIVE-TECHNOLOGIES products was built over a long time, and due to that there are high entry barriers into this markets. New entrants have to invest a high amount of money and know-how to develop this production technology.

6.5.2 Core Capabilities

As our interview partner described, the upper hierarchical levels encompassing also the highest operational level were involved in the consensus building process.

The core-capabilities had been defined as:

1) Development and Production of customer specific state-of-the-art systems in the field of information technology.[45]

2) Providing customer specific maintenance and testing service.

[45] See also Microwave/Milli Meterwave Module-Engineering, Manufacturing & Service

Table 6.4: ***RECEIVE-TECHNOLOGIES Core-Capabilities***

1st Core- Capability: Development and production of customer specific state-of-the-art systems in the field of information technology.

Resource Type:	Percentage of Contribution
Regulatory Resources: -Contracts -Patents	10%
Positional Resources: -Accumulated Data -Reputation Product -Value Chain Configuration	30%
Functional Resources: -Skills of Employees -Skills of Suppliers	35%
Organizational Capabilities: -Capability to develop High Quality Standards -Capability to innovate	25%

2nd Core-Capability: Providing customer specific maintenance and testing service.

Resource Type:	Percentage of Contribution
Regulatory Resources: -Contracts with customers -License	25%
Positional Resources: -Accumulated Data -Reputation of Product/ Firm -Established Distribution Network -Relationships with Customers	25%

Functional Resources: -Skills of Employees -Skills of Supplier -Skills of Alliance Partner	25%
Organizational Capabilities: -Capability to develop high quality standards -Capability to offer a professional service	25%

6.5.2.1 Resources out of which the Core-Capabilities are built

- System specific knowledge of modules /sub-assemblies; this includes also high-precision mechanical engineering knowledge
- Development experience to work with the most modern and innovative materials and technologies (Material Management)
- Long relationship with customers
- Testing experience and acknowledgement: e.g. test equipment calibration (acknowledged by the German Bureau for Calibration Services, DKD)

Which Dimension need most firm resources?

The development of the applied technology is highly cost intensive

Percentage of firm resources spent for project?

[No comment possible]

6.5.2.2 RECEIVE-TECHNOLOGIES offered Products and Services:

Product:

- Sender / Receiver core-technology with various functions and on various platforms (i.e on ships, or in satellites)

Service:

RECEIVE-TECHNOLOGIES Service encompasses

- Documentation for customer in the form of manuals, user handbooks, etc

- Customer training on technical systems
- Design or design-support
- First pilot series manufacturing
- Special packaging and assembly service for receiver-applications according to customer demands, also in plastic technique for complete modules and high volume manufacturing
- Concurrent engineering support for high volume manufacturing of receivers

- **Testing service**

  -Environmental and mechanical testing at component equipment and system level

  -Electromagnetic compatibility testing (EMC)

  -Test equipment calibration (acknowledged by the German Bureau for Calibration Services)

6.6 The Development Project APA-I

6.6.1 Strategic Context

- No monetary restrictions: There was an own resource pool for this project available and a high support came also from the customer side

- No time restrictions: The time frame was adequately set. Any time problems had been solved through "overlapping" development phases. That means that any follow-up phase was started, as soon as the basic problems in the former phase had been solved. But, there was an uncertainty by applying this practice. The more the different phases were overlapping, the higher was the risk that the complete follow-up phase had to be restructured if a former failure had been detected. As the project leader explained, it was like building the first floor of the house as soon as the major work on the fundament has been done.

- Low market risk: There was a low market risk to sell this product as even the resale price was already agreed with the customer.

6.6.2 The Analysis of the current Project Management Practice

A performance and profitability analysis of the "status quo" situation came to the result that in the last 10 years, a high number of RECEIVE-TECHNOLOGIES projects have not reached the prescribed targets of "time" and "cost". Single products had been developed sometimes even with 50% negative profit margin. The analysists assumed that one reason for this situation was the unstructured way in which the products had been developed. According to our interview partner, most of the critical failures had been done at the beginning of the project. Often, the definition phase was underestimated. In such a case, the order was provisionally agreed, but neither the firm nor the customer had an explicit and elaborated idea of all of the features the final product should have.

As the project leader described, due to this former development practice, two situations frequently occurred:

a) The project was started, the team works in a "technical" [Zitat..."ingenieurmäßig"] way on it, then the project was "completed " but the product was not ready.

b) The product was ready but did not match the customers needs sufficiently.

With regard to the negative issues of RECEIVE-TECHNOLOGIES development processes, our interview partner enumerated the most critical aspects:

- Extreme long development process time
- Cost intensive process
- No existing process structure facilitating the initialization of projects

6.6.3 The Underlying Technology of the Development Project APA-I

The applied technology deals with the design and manufacturing of so-called micro- and millimeter-wave circuits produced with the help of "thin"- and "thick-film" technology. So-called integrated monolithic Gallium Arsenide Circuits (GaAs-MMICs) represent the core-technology. This state-of-the-art technology is described as "active" receiver technology. Instead of using one central receiver, these new products are working with several parallel connected receiver modules. This "parallel receive" concept has several advantages:

- High failure tolerance due to compensation effects of the single modules
- Compact products with high power output
- No need for further maintenance

This technology works under extreme situations and even in case of particular damages. It will be utilizable at places where there is no possibility for repairing or changing a device, and/or where the maintenance is very cost intensive (for example in satellites). The application fields of this components are antennas, transmitters and receivers in radar and radio systems, as well as communication electronics and automotive sensors. As mentioned above, the active receiver system consists out of several modules. For building one product it is necessary to assemble up to several hundred modules together. This makes two procedures necessary:

- Low cost mass production
- The miniaturization of the electronic components

The increasing need for more modules makes a cost effective mass production necessary. For that purpose, a so-called “Microwave"-factory is planned, that may produce high quantities with the help of an automated assembly process. As a corporate statement, this continuous development of the technologies guarantees the state-of-the-art technology with high functionality.

6.6.4 The different Development Stages of the Project

In spite of the fact that the project was conducted in a technology-driven environment, it was initiated by customer demand. So far, the planned product did not exist on the market. The underlying technology was state-of-the-art of R&D-technology but not of "practiced" technology. This means that the technological concept was proofed in R&D experiments but not yet transferred into practical products. Such transition into applicable technology was very capital-intensive and therefore, three international customers built an alliance to pay the high development costs.

Several competing firms made offers and at the end, a French company gained the order. But according to international market rules in that business sector, the business had to be shared to a certain amount with the other competing firms. For that purpose, international project workshops had been built. RECEIVE-TECHNOLOGIES took part in one of these workshops. The French firm that originally won the order was responsible for the coordination of the sub-projects and the selection of the participating firms in the respective countries.

RECEIVE-TECHNOLOGIES gained the partnership due to their core-competence in "signal-processing" [Signalerzeugung]. Their competencies and capabilities would cover at least 60% of the necessary project technology. Such technology needs to be adaptable in form of an "assembly system", where new components could be added to the old ones. The missing 40% of the technology had been state of R&D technology without concrete applications as discussed above. Here, the firm had to discover "unknown areas" with a high potential of risk to cover those missing technical know-how.

After an intensive risk calculation process, the corporate management decided to accept the project order due to its high potential profitability. As the project leader described, there was "enormous money" behind this business which could also facilitate the further development of RECEIVE-TECHNOLOGIES capabilities in that strategic sector. The project order should enable the firm to achieve also enormous advantages in front of their competitors.

Inspite of being "only" a subcontractor, the development team of RECEIVE-TECHNOLOGIES made own suggestions for the design of the whole product concept. In addition, they developed an own-standing part of the final product with own prototypes.

The project was planned to have crucial influence on the general development procedures and process structures of RECEIVE-TECHNOLOGIES. The whole development was guided by new development standards forcing the development team to reach certain quality levels.

Due to its complexity, the project had a very long development time with various development phases:

1) ***The Pre-Definition Phase***:

- Determination of product features according to customer wishes.
- Scenario building in which the product should fit
- Determination of tasks that the product should be able to fulfill.

Due to the complexity and the unapproved "R&D"-status of technology and product, this pre-definition phase lasted three years. Independent research institutes were engaged to conduct deeper analyses about the applicability of this new technology. The engineers were engaged to find ways how to transfer this R&D technology into applicable technology.

2) ***The Definition Phase***:

- Determination which product the customer would get and with which specifications

3) The Preliminary Design Phase

- Determination of elements and materials and technical data of the product.
- Building of a risk management plan that describes the probability of several events with their respective problematic and costs.

Moreover, concepts had been built that should help to solve occurring problems. At this stage, the concepts did not cover all technical details, but nevertheless some concrete pictures of the final product. At the end of this stage, the customer should be informed and convinced about the conceptions and the technical features of the product.

4) The Detailed Design Phase

- Building of the first prototype

5) Engineering Design Model

- Building the first prototypes for serial production

Inspite of the complexity of the final product, the team was composed "only" out of 25 people. The development cost were estimated with around 10 Mil. US $. According to our interview partner, the complexity and high development costs made the different preliminary phases necessary. Here, a

common practice is to define product attributes that are not yet completely developed, but where R&D departments already announced their feasibility.

6.6.5 The Interrelationship between the Project and the Core-Capabilities (Subdimensions)

- **Subdimension Technology/Skill:**

  As the project leader documented, there was an upcoming problem caused by the influence of the core-capabilities. In the case of using RECEIVE-TECHNOLOGIES old technology, the team will not leave traditional paths. But, some procedures are not efficient anymore and hinder the development process. The product coming out of this process would be too big, too heavy, and too expensive. But the product development teams have not the best chance to leave these old paths and to develop new product attributes. To mitigate this influence, it was planned to acquire new technologies from new alliance partners.

- **Subdimension Management Practice /Values:**

  As the project leader further described, the corporate management is continuously tracking the outcomes of the respective projects. The corporate management vision is that the development process itself should be more routinized and/or institutionalized. For that aim, they introduced a concept that is structuring and operationalizing the whole development process. With the help of this concept, the rate of occasionally inventions should be reduced. Occasionally inventions are difficult to consider within strategic long term planning, both in terms of time- and resource allocation issues.

  Moreover, this institutionalized development processes should support team leaders that are not so experienced as others. The management's target is that a weaknesses of a project leader should have a neglecting influence on the project performance and outcome. The idea is that such a project should be operationalized in a replicable way that other project teams could reproduce it with the same outcomes. For that purpose, the corporate management introduced checklists that are guiding and tracking the conduction of every project phase. Now, every project will be checked with the help of controlling programs that are based on the "Earn Value" method. Through these programs, so-called "work-package" are defined that should be fulfilled one after the other. While on the one hand, this controlling tools help the project leader to conduct the project, it needs on the other hand tremendous efforts and administrative resources to structure the complete development process and to define and track the fulfillment of those "work-packages". Another negative effect is that the personal freedom in decision making is constraint, because now, the team has to work following the various steps to fulfill the "work packages" and not due their own decisions.

6.7 Influence of the Project

6.7.1 Structural Changes of Main Technology and Extended Market Focus:

Going together with the project, there was a start to change the cost-intensive core-technology of the firm. From this cost intensive technology leadership position, the management plans to outsource parts of the production. As a consequence, the firm is loosing its competitive advantage in that area. There had been long development times in former projects, but because of visionary project definitions (R&D technology) the firm could maintain its technology leadership and competitive advantage. This will be lost now through the outsourcing strategy and the use of cheaper standard components.

As described from the project leader, there are also plans to enter the telecommunication market, but this will happen in a more "evolutionary" way, because at the moment due to the high development costs, RECEIVE-TECHNOLOGIES products are only interesting for "distinct" customers and not for the mass market.

6.7.2 The Change of Project Management Practice: The Initialization of Standardized Project Management Processes

- Going align with the project, there was an organizational change from functional- to project structure
- The working context and facilities for team work were improved:
  -25 team members from various departments + external workforce were relocated
  -New separate working place, with new job descriptions, telephone numbers etc.
  -The team members work 90% for projects and 10% for their former roles
- Going align with the project, there was the beginning of an institutionalization of a more effective product development process. According to the 5-Stage Model of project management RECEIVE-TECHNOLOGIES has only reached the first stage. The first stage describes a scenario, where the project succeeds and falls with the respective project manager and his/her abilities to manage the project. The corporate management was engaged to reach the second stage with the help of the new project. Organizations that have reached the second stage are able to reach certain prescriptions and reproductivity of their projects

The customer made strong prescriptions and set "challenges" for the firm to conduct the project according to his own quality standards. The project management had to present certain documents within certain time periods encompassing all new project phase descriptions and definitions. Monthly revenues were held to discuss these reports. That way, a certain process culture was obtrunized from

the customer side. The project leader rated this obtrusive pressure as very supportive for the development of the process culture.[46]

Before the initialization of the APA-I project, every project development was as good or as bad as the respective team leaders, because as the project leader described, all of the knowledge was stored in their heads. RECEIVE-TECHNOLOGIES had some documented procedures, but those guidelines had not been operationalized due to missing pressure from the management.

The customer succeeded with the initialization of stage two, because he paid the agreed amount only if certain prescriptions documented in the "miles-stone" plan had been achieved within certain time:

- Within the "miles-stone" plan, it was determined when certain documents had to be presented.
- Continuous revenues held the customer up to date and a process report covered the achievements of the respective miles stones
- A protocol of the achievements was written.
- Whenever a new milestone has been achieved, it was officially signed by the project manager and a representative of the customer.
- During the operationalization phase, all project leaders have to assess the time and cost improvements.
- After all, a development handbook was certified

The team motivation was strongly related to the payment of the milestones. But, the project gained also from the fact that the 3 participating project leaders were very experienced and were also high motivated to initialize a new structured development process. Therefore, it was easier for these project leader to link know-how with management capabilities.The corporate management tries with the help of these standardized processes to restructure the whole organization, not only one part of the business area.

Main Failure of the Project:

A negative outcome could be fact that RECEIVE-TECHNOLOGIES lost its technology leadership and consequently a part of its competitive advantage, because its new outsourcing strategy. That way, the firm's products lost value in the eyes of its former customers. The management is challenged with the trade-off between customer specific high price strategie and the mass market.

[46] Comment Project Leader: “So hat der Chaotenladen endlich lernen müssen, wie man ein Projekt richtig dudurchführt.”

6.7.3 Impact of the Development Project on Firm Performance/Competence Development

As described above, the project was initiated together with the target to improve the management practice and improve the project development process. At the moment this project is ongoing. There was no real institutionalized structure for a development processes before the project.

Using the project as change agent, there was also a change in the organization structure, from a more functional structure with specialized departments to a project structure. Here, the corporate management had the vision to combine the positive creative power of teams with efficient institutionalized processes.

Like in our first case-study, to estimate the development of competencies/capabilities, we follow the example of a performance survey that was constructed for a Total Quality Management approach. This survey rates different levels of "competencies/capabilities" according to how effectively the firm can match its own targets (i.e. ROI targets, customer satisfaction targets, etc). Those firm has the best performance which can match best its own targets, so to speak fulfill its strategy.

Table 6.5**:** ***Assessing the Development of Competencies / Core–Capabilities***

	Evaluation:
The project improved the meeting of budget objectives	**With the new processes, also the expenses should become better calculable.**
The project improved the meeting of staffing objectives	**No, (small project team within large company)**
The project improved the meeting of major deadlines	**Improvement of development time through parallel overlapping project stages**
The projects improved the meeting of quality objectives	**No real improvement, project plan leads away from complete inhouse production to buying some parts from other sources.**
The projects improved the meeting of reliability objectives	**Also here, no real reliability improvement, project plan leads away from complete inhouse production. Reliability is one of the critical competitive attributes.**
The projects improved the meeting of cost objectives	**Yes, the same as for budget objectives**

The projects improved the meeting of efficiency objectives	**Yes, outsourcing should lead to more efficiency.**
The projects improved the meeting of user/client satisfaction objectives	**The projects will be completed earlier.**
The projects improved the meeting of service objectives	**?**
The project increased the organization's productivity	**New processes should make the project outcomes more calculable.**
The project improved the organization's competitive position	**With project completion, the firm will reach strong competitive position.**
The project increased the organization's profitability	**Project not finished, but customer paid already intermediate stages.**
The project improved the organization's revenues	**Same as above.**
The project improved the overall performance	**Yes, new processes how to conduct projects.** **[Original comment: "Da hat der Laden erstmal lernen müssen, wie man ein Projekt richtig durchführt]**

As our interview partner explained, the project helped strongly to develop a institutionalized structure for the management of projects. The project outcomes are being continuously tracked. The target would be a development and link of specialized experience with management capabilities for the respective team leaders. As described in the case, the team learned a lot from the management practice of its customers who has reached a higher stage of an institutionalized project development process.

6.8 EXKURS**: General Strategies for the Development of Organizational Competencies & Capabilities: The Competence Academy**

To improve its learning capability RECEIVE-TECHNOLOGIES offers a development program with a content that goes beyond pure technical knowledge improvement. It offers process-oriented learning where the employees should learn independently from their own particular task to think "cross functional" and to be open for new ideas and methods. This should be based on motivation and self responsibility. Within this development program, internal and external consultants are offering knowledge transfer making the employees sensible for potential changes in the areas of "process", "technol-

ogy", and "market". Additional courses like a workshop about innovation management, risk- and conflict management, or an intensive start-of- the-art technology management are also offered.

Courses like System-Engineering and Project Management are mainly held by internal consultants facilitating the internal knowledge- and experience transfer of the idiosyncratic firm knowledge. The learning program has a very high status and is patronized and supported from the respective representatives of the corporate management. The program is open to every employee, and the registration goes simply by fax or email.

Contents and Stages of the Program:

a) High-level top program: Development of superior performance
b) Medium-level program: Know-how and process training
c) Basic general training program: Continual learning

During the last course 14 members had been prepared within 33 days for a project management role with the help of the following subjects:

- Corporate management
- Networking
- Project management
- Project leadership
- Personell management

6.9 Appendix: Questionnaires: Core-Capability Profile

A) Out of which resources and competencies are your firm's first core-capabilities built?

First Core-Capability: "State-of-the Art System Technology"

	1 . Category Regulatory resources protectable in law:	**2. Category Positional resources Due to previous endeavor:**	
40%	• Contracts	• Data bases	30%
	• Licenses	• Reputation of products/service	30%
40%	• Patents	• Reputation of company	
	• Copyright	• Value Chain configuration	30%
	• Trademarks	• Established distribution network	
	• Registered designs	• Others:	10%
20%	• Others		
100%			100%
	3. Category Functional resources due to skills & experience:	**4. Category Cultural capabilities of the organization:**	
50%	• Know-how and experience of employees	• Ability to develop a high level of quality standards	50%
20%	• Know-how and experience of suppliers	• Ability to develop a high level of service standards	
20%	• Know-how and experience of franchisors /partners	• Ability to manage change	
		• Ability to innovate	50%
10%	• Know-how and experience of customers	• Ability to assess the competition	
	• Others	• Ability to work with teams	
		• Participative management style	
		• Learning organization	
		• Ability to provide entrepreneurial climate	
		• Others	
100%			100%

First core-capability profile: 10%(Category 1)+30%(C2)+35%(C3)+25%(C4)

2) Out of which resources and competencies are your firm's second core-capabilities built?

Second core-capability: "Maintenance / Testing service"

	1 . Category **Regulatory resources** **protectable in law:**	**2. Category** **Positional resources** **Due to previous endeavor:**	
40% 40% 20%	• Contracts • Licenses • Patents • Copyright • Trademarks • Registered designs • Others	• Data bases • Reputation of products/service • Reputation of company • Value Chain configuration • Established distribution network • Others:	25% 20% 20% 10% 25%
100%			100%
	3. Category **Functional resources** **due to skills & experience:**	**4. Category** **Cultural capabilities** **of the organization:**	
40% 20% 20% 20%	• Know-how and experience of employees • Know-how and experience of suppliers • Know-how and experience of franchisors /partners • Know-how and experience of customers • Others	• Ability to develop a high level of quality standards • Ability to develop a high level of service standards • Ability to manage change • Ability to innovate • Ability to assess the competition • Ability to work with teams • Participative management style • Learning organization • Ability to provide entrepreneurial climate • Others	50% 50%
100%			100%

Second core-capability profile: 25%(Category 1)+25%(C2)+25%(C3)+25%(C4)

CHAPTER 7: CASE-STUDY COMPUTEX

7.1 General Information: The Historical Development Path

The COMPUTEX GmbH is operating as a distributor firm in the semiconductor market. It has its headquarter in the south of Germany with a workforce of around 150 employees and has also several sales offices across Germany and Europe. Its development path and organizational strategies and values are strongly related to the historical development of its American mother firm COMPUTRONIC[47]. COMPUTRONIC can provide a remarkable success story outgoing from a family business in the early 20Th. Because of the strong relation, we will shortly describe in a retrospective view the historical beginnings:

The American History –Family Beginnings

The former entrepreneur and founder of COMPUTRONIC could be described as a pioneer in the electronic components distribution business. He started his firm by selling surplus parts for radios. When the radio market further increased, he adjusted his distribution system and started to sell parts in high quantity to dealers and manufacturers. He also extended his business into "automobile antenna" assembly and "car-radio" kits over the next 10 years. In the 40th his two sons joined him and in 1955, COMPUTRONIC LTD was incorporated. One of his sons was elected as chairman and CEO of the family business. The other son became president.

The entrepreneur continued to expand his business, and in the 60th, the firm went public as "COMPUTRONIC ELECTRONICS CORPORATION" with a listing on the American Stock Exchange. During the following years, the corporate management developed and applied a strong acquisition strategy. They acquired for example distributorship contracts in the fields of semiconductors, or bought a small catalogue provider to learn about new distribution ways. This acquisition strategy could be described as one of the key strategies that is maintained and practiced until today. That way, new knowledge and experience was brought into the firm. Both, the American mother firm and COMPUTEX in Germany are developing continuously their core-capabilities with the help of this acquisition strategy.

As a new strategic orientation towards an industry-leading supply-chain management organization, the so-called Integrated Material Service (IMS) was launched. This service was managed by a single

[47] Name changed due to disclosure agreements

co-ordinating department that is providing all necessary materials and services needed by customers who want to outsource their "material-coordination" business.

Going align with that organizational development, there was also a change in the corporate management structure of the mother firm. Nowadays, there is one chairman and CEO who is the head of a 10-member board of directors. This CEO is the only director who is employed by COMPUTRONIC, all of the others are external members. As it is described, each of these members brings experience and knowledge form other firms to the board in areas such as international management, finance, operations.

A second so-called management board, consists of 16 members, 12 COMPUTRONIC executives and four outside members. This management board is holding continuously a so-called Quarterly Strategy & Performance Review (QSPR) to assess the financial performance, the company's progress, it's development direction as well as new industry trends and the situation of its competitors.

COMPUTEX

As already described, COMPUTEX has it's headquarter based in a major city in the south of Germany and holds several sales offices in the whole European region. The organization operates like its mother firm in the semiconductor distribution market, and is specialized in providing value services that are "***far more than only buying from suppliers and reselling to customers"***[48]**.**

COMPUTEX offers:

- Electronic components and supply-chain solutions
- Computing technologies and solutions for OEMs [high potential customers]

The corporate management describes the firm as a leading value-added technology-, marketing-, and service provider operating in the international market space. To improve COMPUTEX logistic performance, it's operational planners developed the so-called SCOR Model (Supply Chain Operations Reference Model) that should provide a common language for intra company functions and inter company supply-chain partners. Based on these competencies, the firm is one of the initiator of the Supply Chain Council and is very engaged in improving it's customers supply chain.

The COMPUTEX maintains also to be the leader in "automated point-of-use" replenishment processes. With the help of this service, the customers are offered the ability to link and synchronize supply chain partners. COMPUTEX developed an advanced "auto-replenishment" process with network ac-

cess and with EDI[49] and Fax ordering possibilities. According to COMPUTEX's logistic specialists, this process ***"can accommodate the most complex requirements of the virtual corporate enterprise, such as multiple production sites and consumption points".*** Companies wanting to manage multiple locations and sites over a network will not find any other product on the market with such capabilities.

Among the various value added processes, the services below could be described as the COMPUTEX "key" services, where their core-capabilities are applied:

- Design Services

The Design Services supports Electronic OEM customers by helping them to develop leading edge, high technology products, by leveraging the technical capabilities of COMPUTEX, and in a second step, getting them faster to market.

- Integrated Manufacturer Service (IMS)

This service was overtaken from the American mother firm and for the further development of the IMS processes, the supply-chain experts of COMPUTEX have formed strategic alliances in order to remain the number one organization offering supply-chain solutions within the electronics industry. For this purpose, the firm has built, strong relations with the SAP Walldorf AG, the state-of-the-art software firm for business processes.

[48] Stated on the internet homepage
[49] EDI: Electronic Data Interface; With the help of this normed interface, it is possible to connect the respective firms with each other

7.2 Corporate Management Strategy

In formulating its corporate vision, COMPUTEX goes align with its American mother firm: The corporate vision that could be found, i.e. in public articles or even on employees visit cards, is the following: ***"COMPUTEX will provide the highest value relationships to our customers, suppliers, employees and shareholders, globally".*** During our investigation there was a re-orientation and clearer definition of that corporate vision. The formulation of the new vision could be cited as: ***"COMPUTEX will deliver the highest value to our customers, suppliers, employees and shareholders as the premier technology marketing and service company, globally".***

According to a corporate manager statement, "***the changes are more than semantics. Paramount to COMPUTEX success is our ability to "deliver"- not just to "provide" –value.***"[50] This vision is individually operationalized and clearer formulated for the internal staff throughout the whole German organization and addressed to each single employee with the help of brochures and emails:

COMPUTEX vision may be clearer operationalized focussing on the following key issues:

- ***Higher customer focus***: Around 77% of the target headcount should deal with customer related issues, while the leading management is reduced to the minimum. This means also direct and short communication ways.
- ***Higher supplier focus***: A new management team should develop and improve the relationship with the suppliers like Intel, AMD, etc.
- ***More empowered teams***
- ***More excellence in demand creation***: As the corporate management highlights, the COMPUTEX engineering team is one of it's core assets. Feedback from suppliers as well as from many customers indicates that the quality of this demand creation capability is rated very high. According to a corporate management statement, this capability clearly distinguishes **COMPUTEX** from the competition and offers a clear value proposition to the customers. The target will be to increase the engineer team as soon as possible.
- ***More excellence in day-to-day operations***: There will be a focus on the development of the logistic sales support that goes hand-in-hand with a stronger customer focus.

[50] This statement was sent via group email to every employee.

7.3 Organizational Context

7.3.1 Strategic Context Pattern for Entrepreneurship

Table 7.1: ***Advanced Intrapreneurial Pattern: Intrapreneurship Assessment Instrument***

Sub-Pattern 1: Management Support for Intrapreneurship	**Assessment**
17. Senior Managers encourages bending Rules	**Agree**
18. Corporate Management has experience with Innovation	**Strongly Agree**
19. Management encourages for Project Activities	**Agree**
20. Corporate Management makes Sponsorship	**Agree**
21. Individual Risk-Takers are often recognized whether eventually successful or not	**Agree**
22. Management encourages for calculated Risk	**Agree**
23. Small and Experimental Projects are supported	**Agree**
24."Risk-Taker" is considered as a positive Attribute	**Agree**

Comment to Sub-Pattern 1:

As we described before, there is an ongoing change towards more empowerment of all employees, not only for the upper hierarchies. As planned from the corporate management, all the teams should be empowered to achieve their individual tasks with a minimum of management interference. As a result, each employee will have to overtake a wider responsibility and understand the impact of his/her action on others around them. The management teams will meet on a regular basis to control the progress against the business goals. Decisions taken by this management team will depend from the various teams in the entire organization. The management makes informal sponsorship to persons who could proof in past that their projects had been successfully increased the firm performance. With regard to the support for projects, we can say that even huge incongruent processes will be supported, but the team should proof that there is a chance to increase the firm performance with this process (for example by finding another firm who is already applying this process).

Sub-Pattern 2: Organizational Structure	Assessment
25. Second Chances after Mistakes	Strongly Agree
26. Mistakes as Learning Experiences	Strongly Agree
27. Important to look busy	Neutral
28. Difficult to form Teams	Disagree
29. Concern for Job Descriptions	Strongly Agree
30. Defining Turf is important	Agree

Comment to Sub-Pattern 2:

Due to the ambiguous environment, failures are not avoidable, and in general, no one was ever punished, nor he/she was not given a second change after a mistake, even if it was a bigger issue. Teams could be built relative easily within departments, but they were frequently been changed. Other teams that had been foreseen for a longer time were relocated in a separate department. The concern for job roles /descriptions is high.

Sub-Pattern3 : Reward and Research Availability	Assessment
32. Availability of Funds	Agree
33. Problems with Company Budgeting Process	Strongly Disagree
34. Additional Rewards / Compensation	Agree
35. Several Options for financial Support	Neutral
36. Problem Solving with Co-Workers	Agree

Complementary Questions	Assessment
37. A more open, trusting organizational Culture	Agree
39. Less Bureaucracy	Neutral
40. Teams are isolated in a separate Department	Agree
41. Frequent use of cross-departmental Teams	Agree
42. Continuity of Team Taskforce during whole project (engineers, marketing, etc.)	Neutral
43. Use of empowered Teams	Agree
44. Increased Employee Involvement in Design and Planning	Neutral
45. A more active Employee Suggestion System.	Agree

46. Increased Employee Autonomy in Decision Making	**Neutral**
47. Personal Career linked with project	**Agree**
48. Personal Evaluation based on project success	**Agree**
50. Increased Employee Interaction with Customers and Suppliers	**Agree**

Comment to Scale 3 and 4:

As we already mentioned, the development of a more "trusting" organizational culture encouraging the self-responsibility of its employees took a large step forward, when a new CEO was employed. This manager came from an organization where an intrapreneurial culture was already existing and highly supported. Now, a main target of COMPUTEX corporate management is to decrease the prevailing bureaucracy and the long decision ways. According to the new CEO, there remains a lot to do. At the moment, COMPUTEX has an email culture were thousands of emails are going around searching for somebody to whom it maybe concern. For this task, the firm has taken a lot of efforts to establish task-forces, round table discussions and cross-departmental development teams to make the daily processes more efficient.

Only recently, there was mayor "suggestion" initiative, where the employees could make suggestions for further performance improvements. Additionally, the employees could rate the performance of their direct managers, the corporate management and their current working conditions. As results, it came out that while there was a good team working atmosphere at the headquarter, the collaboration and communication with the regional offices would need some further improvements.

The issue of employees' autonomy in decision making could be described as two-folded and most critical for the success of the MARGIN-20 project. While on the one hand the autonomy of the marketing team increased on an European level, it decreased on the other hand at the local sales offices. This action was accompanied by great concerns from all sides. While the margin increased according to the targets, it could be observed that many employees left the company, much more than the normal statistical fluctuation would indicate. After one years, the corporate management decided to give the authority back to the regional sales offices. The MARGIN-20 program was continued with all other aspects, but the teams of every sales office had been given back the responsibility to decide over their own margin to release the blocks. To improve the collaboration between the marketing and sales departments, a lot of efforts have been done to initiate visits from every side to built mutual trust and understanding.

7.3.2 Fit into the "Four-Type" Model (Miles & Snow, 1978)

COMPUTEX matches to a high degree the organizational characteristics of the "prospector" type. As Burgelmann notes, the emphasis of the "prospector" on innovation is hindering the firm in developing

a highly efficient organizational performance. As the competitive advantage of COMPUTEX depends to a high degree on its internal processes, it changes and adapts those processes frequently, as soon as the management discovered an obviously better one. As described before, this includes also the reorganization of complete departments to other cities (or even countries). But, in the same way, if a new process proves to be not very efficient, there is no hesitation to change the plan and to stop it at the very beginning.

Table 7.2: COMPUTEX: ***Characterization of Strategic Behavior***

	Very Low Degree	Low Degree	Neutral	Notable Degree	Very High Degree
Defender					
Prospector					X
Reactor					
Analyzer					

7.3.3 The Communication Channel Continuum

Table 7.3**:** ***The Communication Channel Continuum***

		Very low Degree	**Low Degree**	**Neu-tral**	**Notable Degree**	**Very High Degree**
Rich Channels	***One-on-One / Face-to-Face Communications**				**X**	
	*** Hallway/Coffeepot Communications**					**X**
	*** Small Group Meetings**				**X**	
	***Video Conferencing**				**X**	
	***Telephone Conversations**				**X**	
	*** Voice Mail**				**X**	
	*** E-mail**					**X**
	*** Large Group Meetings**			**X**		
	*** Handwritten Personal Notes**			**X**		
	*** Advanced Copies of Agendas**			**X**		
	*** Faxes**			**X**		
	*** Interoffice Memos**			**X**		
	*** Formal Speeches**			**X**		
	***Letters**			**X**		
Lean Channel	***Reports**				**X**	

With regard to the internal communication forms, it is remarkable that the so-called hallway/coffeepot communication had a strong influence on everydays communication flow. But, the most frequent communication form represents the e-mail. Here, we could already speak of an email-culture, where thousands of emails had been sent around, and often the single employee receives up to 100 a day. The employees have to learn to sort the more important ones out and to delegate or neglect the others. After the email follows the telephone as communication tool. Personal meetings are more rarely, more frequently in upper hierarchies, but approximately one time a week for the average workforce.

7.4 Economic Environment

7.4.1 Description of the Industry Sector

The semiconductor (distribution) industry is a highly ambiguous industry sector were changes are not easily predictable. The distribution market is strongly affected by various variables and strongly dependent on international influences like the US or Japanese economical situation. Because of the long term contracts with chip suppliers like Intel or AMD, the distributor firms are carrying a high risk to "sit" on the shelves with their products if the demand goes down. In that situation, there are no more customers, but the distributor has committed himself to take the agreed quantity from the chip producer. To prevent this situation, all firms operating in this sector are undertaking enormous efforts to develop strategic forecast tools/indicators for the market / demand development.

An experienced manager who worked in this business for over 15 years explained that there are "up- and down" cycles that normally change every 5-7 years their direction. The turn from an "up"- to a "down"- cycle could happen very quickly over a weekend, and is very difficult to predict due to the many parameters involved. On an up-cycle situation, the management has to cope with the problem to find and to deliver enough products to the customers due to the increasing lead times of the chip producers. Another problem would be to find highly skilled employees, because they are drifting away to the most attractive companies. When the industry is on a down-cycle, the firm has the problems of overstock, over employment and decreasing business margin leading consequently to a decrease in return on investments. Therefore, if the environment is such ambiguous, it is critical to have an efficient performance process that enables the firm to react to any changes, and to be profitable even in a decreasing demand situation. It is also critical that any strategic changes (like margin decisions on earning profit margin) should be transformed quickly into the daily performance process.

7.4.2 Competitors and Competitive Strategies

The competition in the semiconductor distribution market is very direct, because there are only a few parameters on which a firm can build up its competitive advantage. In general, these are :

- Product price
- Logistic support: Availability / short delivery time
- Product info support: Application, last time buy possibility, recommendation of alternative parts

The distributor firm has different ways to influence the product price:

a) Volume discount: Lower price because of high quantity
b) Project registration price: Investing engineering efforts by developing new applications which are supported from the supplier firm with a special price

ad a) In general, supplier firms like Intel, Motorola, AMD etc. decrease the price with regard to the ordered volume "ex post". For example, COMPUTEX has to buy 20000 pieces at the normal price from Intel, but afterwards, if COMPUTEX sells 1000 pieces to a customer, it will receive money back from Intel for this 1000 sold pieces. This procedure has advantages for both sides, on the one hand it is a secure possibility to sell high quantities for the supplier, and on the other hand the distributing firm can continuously adapt to price decreases with their stock.

But nevertheless, this procedure is very competitive. Every competitor will normally get the same price if he orders the same quantity. Here, the competitors can only improve their internal operating processes to be more profitable. This was one major impetus for the initialization of the MARGIN-20 project to improve the internal processes.

ad b) The second way to obtain a competitive price advantage is to register a so-called "design-in" project. Here, the price is protected from the supplier firm, and no competitor should get the similar price for the parts involved in that project. But this process requires well developed technological capabilities to guide customers by designing new projects and applications. It has always to be a state of the art product involved on which the supplier marketing department has its focus. For this purpose, COMPUTEX has hired highly skilled engineers who advise and support the customers in designing the new applications.

7.5 Consensus Building on Core-Capabilities and Competitive Advantage

7.5.1 Competitive Advantage of Products / Services

If we use Hall's analytic framework, we have to consider the following product/service attributes that enable COMPUTEX competitive advantage:

```
Price.............................40...%
Quality...........................%
Functionality.....................%
Aesthetics........................%
Availability......................40...%
Image.............................%
After Sales Service...............%
Innovation........................10...%
Customer Convenience..............10...%

=100
```

Which of the competitive attributes could be imitated?

The most crucial attribute for COMPUTEX, the price, is at the same time the most affected one, because it can be imitated from everybody. As a general business agreement in this industry, the supplier firms are offering the same price for the same quantities to everyone. That means, the only barrier would be the financial situation of the competitors.

Protectable in a better way are the attributes:

- Availability
- Innovation
- Customer Convenience

because these attributes result out of a complex organizational and logistical performance

7.5.2 Core Capabilities

7.5.2.1 Consensus Building Process on Core-Capabilities

In terms of the consensus building process, the corporate management of COMPUTEX oriented themselves on the core-capabilities of its American mother firm, but had to adapt them to the European organizational context which is not totally comparable with the American one, one critical issue for example are the different cultures working together.

COMPUTEX core-capabilities are focused on the one hand on ***logistical services*** on the other hand on ***demand creation*** with their engineering teams. Their core-capabilities enable the following value

added processes that are critical for the firms competitive advantage. Traditionally, the role of distribution was to buy products in volume and sell them to customers in smaller quantities. COMPUTEX goes beyond that providing a broad product line-cards, convenient one-stop shopping with emphasis on on-time delivery, responsiveness and quality.

First Core-Capability: Design Service & Demand Creation: COMPUTEX design services supports Electronic OEM customers by helping them in their development activities for leading edge, high technology products.[51]

Second Core-Capability: COMPUTEX logistical ***Integrated Material Service*** (IMS): The Integrated Material Service teams are engaged to provide world class supply-chain management service to electronic OEMs and contract manufacturers.

Thus, the teams can help their customers to overcome their most difficult logistical problems. The IM-Service combines the problem solving capability, built during many years of business experience, with highly sophisticated information technology. As it was stated, COMPUTEX capabilities help customers to build efficient and responsive supply chains. For this purpose, the IMS team members help customers to define their material management requirements and to identify their supply-chain inefficiencies. That way, they help also to reduce the customers cost for their stored inventory.[52]

[51] In addition, they are brought faster to market using the leverage effect of COMPUTEX technical resources.

[52] IMS Mission Statement: "COMPUTEX IMS is dedicated to providing world-class supply-chain management services to electronic OEM's and contract manufacturers. IMS combines in-depth experience in solving customer's problems with highly sophisticated information technology and COMPUTEX core-competencies to help customers build efficient and responsive supply chains. COMPUTEX has helped hundreds of customers to get their products to market faster, and COMPUTEX IMS will continue to provide exceptional service and reliability."

7.5.2.2 COMPUTEX Core-Capabilities are comprised out of the following resources:

Table 7.4**:** ***COMPUTEX Core-Capabilities***

1.First Core-Capability: Design Service & Demand Creation

Resource Type:	**Percentage of Contribution**
Regulatory Resources: -Contracts -License -Design-In Protection	25%
Positional Resources: -Accumulated Data -Reputation of Service -Value Chain Configuration -Established Distribution Network	25%
Functional Resources: -Skills of Employees -Demand Creation Skills	25%
Organizational Capabilities: -Capability to develop high Quality Standard -Capability to offer high Service Level -Capability to innovate -Learning Organization	25%

2.Second Core-Capability: Integrated Material Service

Resource Type:	**Percentage of Contribution**
Regulatory Resources: -Contracts	20%
Positional Resources: ***-Accumulated Data***	30%

-Reputation of Firm -IT System -Warehouse Technology	
Functional Resources: -Skills of Employees Asset Management Skills Logistic Experience	20%
Organizational Capabilities: -Capability to develop high Quality standard -Capability to cope with Change -Capability to work with Teams	30%

- ***Information Technology***

COMPUTEX has built up an information system in electronics distribution. The firm gives their customers visibility to its system, its schedules and inventory. By using special software tools, the IT specialists can identify and analyze the cost ***prior*** to program implementations...and ***after*** implementation. For this purpose, the company has integrated state of the art technology to maintain its enormous database.

- ***Demand Creation Skills***

One of COMPUTEX key-resources are the skills of its field-application engineers who are spezialized to find new ways of technology applications and help their customers to register new products.

- ***Warehousing Technology, Asset Management Skills, Logistik Experience***

Bownet has implemented a fully automated warehousing operations system that serves manufaturers worldwide under ISO-registered processes with full automation processes.

Among all the dimensions of the core-capabilities, the "skill development" and the information technology /software development are the most expensive issues.

7.6 The MARGIN-20 Project

7.6.1 Strategic Context

- No Monetary Restrictions: For this enterprise, there was a very high budget calculated, because this project was assessed to have crucial influence on the firm's rentability and future performance.

- Time Restrictions: The project was planned to be conducted within one year, including the relocation and centralization of the various departments in the headquarter and the update of the SAP system. At a great part, this target was reached within that one year. Nevertheless, the update of the SAP system developed to a continuous process that is still ongoing.

The MARGIN-20 project was initiated after a strategic performance analysis (including various bench marking processes) which brought out that COMPUTEX profitability was slightly decreasing while its competitors were announcing increasing profits. As explained before, the semiconductor industry is a highly ambiguous industry sector and changes are coming mostly unforeseen. But at the moment of the strategic analysis, the industry was in the middle of an up-cycle development with an increasing customer demand market and all the competitors were announcing very good business results. The results of COMPUTEX's business analysts were surprising and at the same time alarming, because decreasing margins within an increasing market are highlighting a critical performance problem. In addition, the analysis brought out that there were also prevailing communication problems between the various departments and offices.

The MARGIN-20 project that was initiated as an answer to the performance deficit, encompassed the following actions:

- Introduction of an international operating "Margin-Controlling Team"
- Centralization of the European sales controlling team at the headquarter
- Updating the SAP program with advanced margin control functions

The project started in August 1999 and had a critical impact on the whole organizational structure as it was foreseen. The three major actions above had been conducted in an overlapping process that started with the building of a SAP-Programming team, collocated at the headquarter. This was accompanied by a relocation process of the various controlling groups from the respective European sales departments also to South-Germany.

The relocation/centralization process was planned in several steps. At the first stage, all members of the decentralized controlling teams had been given the change to start working at the headquarter during the week, but they could fly back to their respective home countries on the weekends for the following six month to regulate all their private and business affairs. This offer was very cost intensive, but guaranteed that the highly skilled employees did not leave the organization. Most of them could easily get new jobs within other firms at their home countries. The whole project was also supported from COMPUTEX re-allocation service who helped the foreign employees with formalities and offered hotel and flat service.

Considering the firm's rentability, during the time before the centralization, each sales department throughout Europe had a task force that had been in charge of margin control issues. But, the international sales departments often made their own plans and did not follow the strategic implications from the headquarter. Because of that, there was often the discussion, whom to make responsible for wrong decisions, so to speak wrong margins in the respective sales orders.

Very often, there was the argument from the sales departments that there was a need to sell with low margin to get a large follow up order. Another critical reason for volume sales with low margin was also the reward and bonus system applied for the sales offices. As usual in this industry, they had been paid in the first line for the sales volume and not for the margin. For this reason, there had been very often high volume sales with low rentability. Additionally, due to the different "buy"- and "sell" currencies and the currency fluctuation between Dollar and Euro, orders were shipped with a different margin than calculated.

To prevent all those critical issues, the SAP program was updated with new possibilities to block those orders with low, or even negative margin. But, the programming of this blocking tool and the update of the new SAP version was a very complex enterprise and lasted over 6 month.

An international team composed out of 30 IT programmers and consultants from all over the world working together in an isolated department at the headquarter. To support that update operationally, all departments of the headquarter had been completely restructured. This centralization process was followed by the foundation of the so-called Level–I Margin Control team. This team composed out of 8 controllers was responsible for the first margin analysis of any blocked orders. The team worked cross-departmental and international oriented. The eight team members operated within the following matrix scheme comprised of countries and product business unit (PBU).

Table 7.5: ***Linkage of every controller to a country and to a Product Business Unit***

	England	France	Italy	.....
i.e.: Bluetooth Data Communication products PBU	Controller 1	Controller 2	Controller 3	.....
i.e.: Microprocessor PBU products	Controller1	Controller2	Controller3	.....

Every controller was responsible for one country and several product business units (PBU) that were dealing with that country. The controller was working closely together with the so-called product specialists of the respective product business units. Within the product business unit, the product specialists were responsible for all the "buy" prices given from their suppliers. The controller should now work together with the responsible product specialist, double checking the margins for all blocked orders, to eventually releasing them after a final proof.

The major parameter for any margin calculation is the ratio between buy and resale price based on the moving average price (MAP) of the stock inventory. The moving average price calculation is considering automatically the average price between the old products on stock and the new incoming products. If after a first analysis the controller found out that the order is not blocked due to a data problem, the order was passed on to the respective PBU product specialist who then tried to rearrange a better buy price from the supplier.[53]

Table 7.6: ***Product Specialists in every Product Business Unit***

PBU1: Microprocessor Business Unit	PBU2: Blue Tooth Data Communication Business Unit	.....		
Product Specialist AMD Products	Product Specialist AMD Products	.....		
Product Specialist Intel Products	Product Specialist Intel Products	.....		

[53] As an exception, single orders could be shipped with low margin, if the whole package was positive, but this had to be documented.

The Margin Level–I group team members were recently recruited for the work at the headquarter. They received a two month training from SAP administrators and experienced colleges (the first month SAP basic functions and the next four weeks all the necessary programs for the margin analysis). During that time, all the remaining product specialists and their managers received an intensive SAP update training at a special SAP training center in Luxemburg. During two weeks, the whole department took part on that training, every week 50% of the staff, to guarantee the basic functionality of the remaining workforce.

Now, with the help of the updated SAP controlling features, the group was able to stop every order departing from the prescribed resale margin policy, while the sales departments across Europe was given no more authority to release these orders on their own decision.

But, the first major obstacle was that the new installed SAP Program update was not completely free of software failures. Most of the routines had been tested, but nobody knew how the program would operate in a real life environment. The test was conducted with an appropriate data base, but there was no guarantee that the COMPUTEX real product data base was completely correct, and the program would behave in the same way as under test conditions.

In praxis, the Margin-Block-Level-I team had to investigate every single order line item. Often, the question was if it was really the bad margin that blocked the order, or did the SAP program just calculate with wrong data. Basis for any calculation were the various customer contracts and stock profiles. Any contract change had to be communicated immediately to the Level-I team for consideration. There were also different margin agreements by customer (A,B,C importance) and by product (so-called high- or low-runners).[54]

The whole calculation and release process was guided by some interventions from corporate managers who every morning were tracking the amount of blocked orders. The management was permanently concerned about the trade-off between ***customer satisfaction*** and ***resale margin***. For some key-customers, it was arranged that the critical orders were released automatically and commented afterwards, because the business was too critical to loose, only because of wrong calculations.

[54] Additionally, there was an agreed currency fluctuation clause that had to be considered, if the Euro/Dollar ratio changed.

7.6.2 Interference of Project with the Core-Capabilities‘ Subdimensions:

- Interference with Subdimension Technology and Skills

The interference with these subdimensions could be described as being not so critical, as the process technology remained the same and was "only" updated. Resulting from this update, the teams had to learn the application of the new program features, but after a certain period, all employees were able to use it. The teams helped each other with mutual explanations. Some problems occurred due to new employed controllers and product specialists who had not been very experienced and did not calculate accordingly the first time. In this cases, the training process took more time.

- Interference with the Subdimensions "Management Practice" and "Organizational Values"

As already mentioned before, the project was conflictive with the concept and values of the organization, especially with regard to the IMS service, the "key"-logistic tool that should guarantee the customer a just-in-time delivery.

Now, due to the new margin block functions, also those IMS sales orders for very important customers were blocked, and COMPUTEX had to pay contractual penalty for not being able to deliver on time. The case was especially problematic, if a sales order was blocked due to a misleading information like a wrong price on which the SAP system calculated automatically and blocked it.

Another value conflict was the restriction of the margin release authority only to the teams in the headquarter. In the past, the external sales persons were working within an entrepreneurial climate and had not been accustomed that their actions had been controlled in that manner. Often, the sales persons had to call to the controller 10 times a day to ask for margin release issues. Recently, after a two years period, the margin release authority was given back to the respective sales departments. Sales was given back the authority but also the self-responsibility. From now on, they also had to explain in detail, why they sold certain goods at a certain margin.

Additionally, the evaluation system has been changed. Now, the bonus of the sales force and the marketing / controlling team at the headquarter will be calculated in the same way. This should align both interests.

7.6.3 Experiences from the Project

7.6.3.1 Main Failure

As described above, one of the major experience the corporate management made, was the fact that taking away authority from employees or departments is a critical enterprise that may cause serious troubles with regard to employee commitment and collaboration in the long run.

On the first view, the project seemed to be successful because the margin increased drastically, but in the long run, after a two years performance period, it was visible that the lost empowerment had a critical influence on the sales out, billings and personal motivation.

After an employee survey about working issues like "working atmosphere", "collaboration" etc., it was indicated that the collaboration with the other departments seems to be a difficult act that hinders efficient work. This situation was caused mainly through the new project.[55]

7.6.3.2 Structural Changes caused by the Project

The MARGIN-20 project was strongly intertwined with the COMPUTEX re-organization process. As already described, it caused crucial changes in the organization's structure, and also changes in COMPUTEX organizational values like its "collaborative culture", "personal empowerment" and/or "entrepreneurial spirit". Employees from all over Europe had to reallocate themselves at the head-quarter. For this enterprise, the management had to cope with several challenges. On the one hand, the "business" coordination of the several Product Business Units in one department had to be organized, on the other hand the integration of the cross departmental operating Margin Control Group had to be planned. At the end of the project, the whole organization looked completely different. While the sales department decreased in number of employees, the headquarter increased its workforce and authority.

[55] To mitigate this effect, there were exchange programs initiated where employees from each departments visited each other spending a day within that other department. This way, they experienced the others' problems and perspectives. Moreover, they could see, which computer program and screens the others used, and for example how it looks like for sales, when an order is blocked.

7.6.3.3 General Impact of Development Project on Firm Performance

Among all the firms in our sample, COMPUTEX is the firm in the case-study sample that made the most and critical changes during our empirical investigations. Here, the success of the project could be tracked with ROI statistics, before and after the project. But the management restricted also the self-empowerment of some employees which lead to performance decrease in the long run. This was adapted and mitigated with another organizational change one year after the project.

Table 7.7*:* ***Assessing the Development of Competencies / Core–Capabilities after the project:***

	Evaluation /Comment
The project improved the meeting of budget objectives	Agree
The project improved the meeting of staffing objectives	Agree; **The project challenged the management to link and relink tasks to people**
The project improved the meeting of major deadlines	Agree; **Planning capability improved as well. Special existing capability to meet time prescriptions**
The projects improved the meeting of quality objectives	Neutral; **Meeting time objectives was the priority. Quality had to be redefined in distribution business**
The projects improved the meeting of reliability objectives	?
The projects improved the meeting of cost objectives	**Agree; No stringent cost objectives, relative easy to fulfill**
The projects improved the meeting of efficiency objectives	Agree; **In the short run, efficiency was improved**
The projects improved the meeting of user/client satisfaction objectives	Disagree; **In the short run, the clients were often more dissatisfied due to their blocked orders**
The projects improved the meeting service objectives	Disagree; **Similar to the last point, if we could understand delivery as service, this service was not improved , even the opposite took place.**

The project increased the organization's productivity	Neutral; **Such areas were productive issues took place like the programming center were not directly affected, so there was no improvement measurable in relation to the project.**
The project improved the organization's competitive position	Agree; **This project improved the competitive postion as it provided the management with controlling tools that could be used in various ways to quickly react to various challenges**
The project increased the organization's profitability	Strongly agree; **As this was realtive easy to measure and to proove with the weekly margin commentaries**
The project improved the organization's revenues	Agree; **This goes together with the profitability**
The project improved the overall performance	Agree; **The project made the organizational processes more operationable, visible and calculable**

The project had a crucial impact on the organization structure that encompassed even a reallocation of the firms departments to facilitate those controlling processes. After one year the strategic context was reassessed and modified towards more self-responsibility.

7.7 Appendix: Questionnaires handed out during the interviews

A) Out of which resources and competencies are your firm's first core-capability built?

First Core-Capability: "Demand Creation"

	1 . Category Regulatory resources protectable in law:	**2. Category Positional resources Due to previous endeavor:**	
15%	• Contracts	• Data bases	15%
15%	• Licenses	• Reputation of products/service	40%
	• Patents	• Reputation of company	
	• Copyright	• Value Chain configuration	15%
	• Trademarks	• Established distribution network	30%
	• Registered designs	• Others:	
70%	• Design in Protection		
100%			100%
	3. Category Functional resources due to skills & experience:	**4. Category Cultural capabilities of the organization:**	
50%	• Know-how and experience of employees	• Ability to develop a high level of quality standards	25%
	• Know-how and experience of suppliers	• Ability to develop a high level of service standards	25%
	• Know-how and experience of franchisors /partners	• Ability to manage change	15%
		• Ability to innovate	20%
	• Know-how and experience of customers	• Ability to assess the competition	
50%	• Others: Demand creation skills	• Ability to work with teams	
		• Participative management style	
		• Learning organization	15%
		• Ability to provide entrepreneurial climate	
		• Others	
100%			100%

First core-capability profile: 25%(Category 1)+ 25%(C2)+ 25%(C3)+ 25%(C4)

B) Out of which resources and competencies are your firm's second core-capability built?

Second Core-Capability: "IMS Logistic Service"

	1 . Category **Regulatory resources** **protectable in law:**	**2. Category** **Positional resources** **Due to previous endeavor:**	
100%	• Contracts • Licenses • Patents • Copyright • Trademarks • Registered designs • Trade Secrets.	• Data bases • Reputation of products/service • Reputation of company • Value Chain configuration • Established distribution network • Others:	20% 20% 30% 30%
100%			100%
	3. Category **Functional resources** **due to skills & experience:**	**4. Category** **Cultural capabilities** **of the organization:**	
50% 50%	• Know-how and experience of employees • Know-how and experience of suppliers • Know-how and experience of franchisors /partners • Know-how and experience of customers • Others	• Ability to develop a high level of quality standards • Ability to develop a high level of service standards • Ability to adapt to change • Ability to innovate • Ability to assess the competition • Ability to work with teams • Participative management style • Learning organization • Ability to provide entrepreneurial climate • Others	25% 25% 25% 10%
100%			100%

Second core-capability profile: 20%(Category 1)+ 30%(C2)+ 20%(C3)+ 30%(C4)

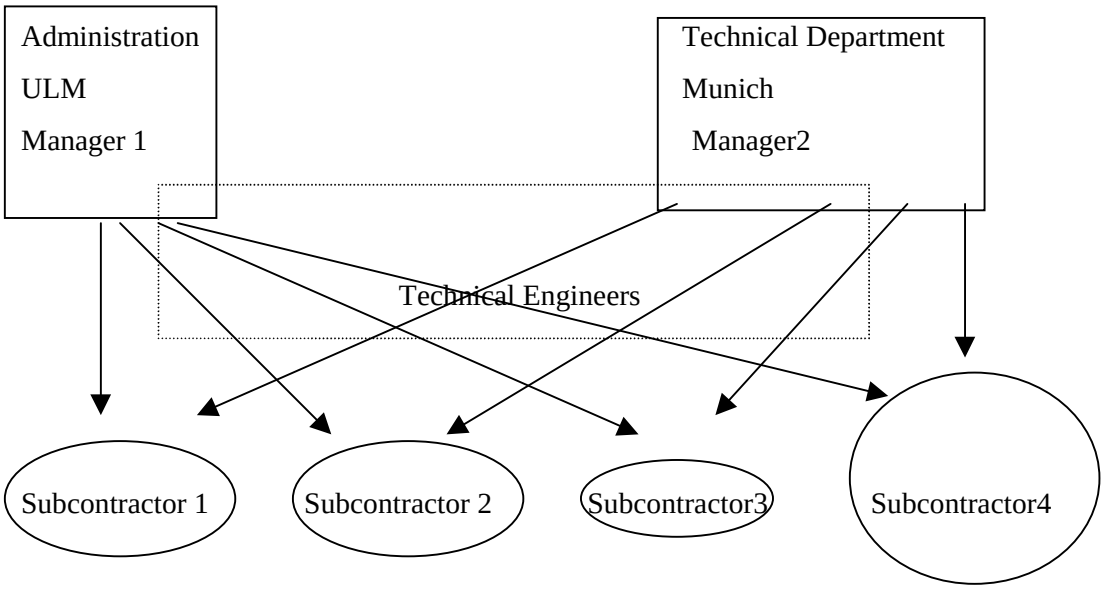
CHAPTER 8: CASE-STUDY ULMOD.COM

8.1 General Information: The Historical Development Path

ULMOD.COM started its business from the Science Park of the "Wissenschaftsstadt" Ulm around 10 years ago. In 1997, we already focused on that firm in a former study that investigated the forms of information management in Science Parks (collaborations, joint ventures, research alliances, etc.), as basis for new innovations and developments. The firm has established itself originally as provider of cable-receiver technology. For this purpose, it developed certain technical solutions together with the University of Ulm and the University of Applied Science of Ulm.

After a first re-organization in September 1995, it kept its main quarter (administration, customer service) in the Science Park of Ulm, but established the technical department in Munich. The core-staff is composed out of 15 employees (administration, technicians, corporate managers). Due to the fact that the German Telekom had a monopolistic status for the whole cable infrastructure in the past, all companies that planned to enter in that sector had to built collaborations and agreements with that incumbent public firm, so did ULMOD.COM. After the opening of the monopolistic market, ULMOD.COM as private firm was the pioneer in this sector and took technological advantage from its long lasting collaborations with the two Universities.

Figure 8.1: ***Organigram ULMOD.COM***



The firm's vision is to push the state-of-the-art performance of communication technology. At the current stage, the rate of experimental projects decreased in favor of routinized customer demand projects. The amount of experimental projects is rated with 5% in favor of projects on customer requests. Regarding the structure of the organization, it is remarkable that ULMOD.COM has several several subcontractors with their own regional workforce. These subcontractors are committed and engaged according to the respective workload. With that flexible organization structure, ULMOD.COM committed itself to guarantee the same service quality in any region. With the help of these regional sub-contractors, the firm is covering the geographic areas Bayern, Baden-Württemberg and Nord-Rhein-Westfalen.

Technologically, ULMOD.COM is operating in three fields:

- ***Cable/Satellite Technology Sector:*** The CableTV/Satellite-technology builds the fundamental basis of ULMOD.COM's business. The firm is applying and constantly improving a technology where the digital satellite signal can be converted before it reaches the respective end user. That way, there is no need for the end user to install a digital receiver at home. This technology offers great flexibility and cost effectivity compared to the "normal" cable technology, where monthly fees had to be paid for the home-based digital receiver.

- ***Communications Technology Sector:*** While any form of digital information can be transmitted via cable technology, ULMOD.COM's system makes it possible to transmit various kind of signals via the same cable.

- ***Data Technology Sector:*** ULMOD.COM develops Data Technology in the form of so-called "structured networks" for television- and/or computer systems. Such structured networks are offering the customer the possibility to adapt to future applications by changing only single components. (Our case-study project falls in this category).

Notable is ULMOD.COM's high degree of inventions built up on the core-competence of ***cable***- and ***communications technology***. Here, one highlight is the possibility to control certain parameters like for example "temperature" or the "consumption of water" over long distances. A "converter" translates the analog signals into digital data which will be sent via cable or even satellite to a centrally located control unit. This central control unit department can analyze the data and adjust the parameters if it is necessary. As a great advantage, the already existing TV cable could be used. Another possibility to make usage of the already existing TV cables is its use for internet technology. All these applications need a specialized technology that allows to transmit different types of signals through

the same medium. ULMOD.COM puts all its effort to develop this technology, and it was the first German firm that invented this way of using the old infrastructure with those new possibilities.

8.2 Organizational Context

8.2.1 Strategic Context for Intrapreneurship Culture:

The organizational climate and working atmosphere could be described as two-folded. On the one hand, ULMOD.COM has two owner-managers, father and son, who are clearly directing and controlling the startegic course of the firm. These two owner managers have clear expectations and implications of the outcomes reached by ULMOD.COM's own staff and/or their subcontractors. On the other hand, there are few hierarchical levels, no long bureaucratic decision and a good team atmosphere.

We analyzed the strategic context with our constructed entrepreneurial pattern. Like in our case-studies before, within the interviews, we asked for an assessment of the existing entrepreneurial attributes. We arranged/summarized these assessments under the different subpatterns below:

Table 8.1: ***Advanced Intrapreneurial Pattern: Intrapreneurship Assessment Instrument (Kuratko, 1990)***

Sub-Pattern 1: Management Support for Intrapreneurship	**Assessment/ Comment**
17. Senior Managers encourages bending Rules	**This is not really the case**
18. Corporate Management has experience with Innovation	**This could be agreed, but more in the application of new technology than its development.**
19. Management encourages for Project Activities	**This is not really the case. Projects are started by customer demand.**
20. Corporate Management makes Sponsorship	**Sponsorship exists only in the sense that the management supports all necessary hardware for the project for the subcontractors.**
21. Individual Risk-Takers are often recognized whether eventually successful or not	**Disagree**

22. Management encourages for calculated Risk	**This is not really the case**
23. Small and Experimental Projects are supported	**This is not really the case**
24."Risk-Taker" is considered as a positive Attribute	**Disagree**

Comment to Sub-Pattern 1:

ULMOD.COM's strategy to outsource the operational business to sub-contractors creates a working situation that depends on the self-responsibility, commitment, and the entrepreneurial initiatives of each single subcontractor. Nevertheless, these subcontractors have narrow time schedules to fulfill and the corporate manager motivate more to task fulfillment than to risk taking. As most of the sub-contractors are exclusively working for ULMOD.COM, they are highly dependent from the firm.

Sub-Pattern 2: Organizational Structure	**Assessment /Comment**
25. Second Changes after Mistakes	**For both: Depends on the personal history, but more critical for subcontractor**
26. Mistakes as Learning Experiences	**For the core-team: To a certain extend if the mistake is not to critical.** **For the subcontractor:** **Failures in a routinized project should be avoided and are more critical.**
27. Important to look busy	**For the core-team: If the boss is there, should not sit around without working.** **For the subcontractor: No, no control due to the distance**
28. Difficult to form Teams	**For the core-team: No** **For the subcontractor: No, team responsibility in the hand of the subcontractor**
29. Concern for Job Descriptions	**For the core-team: Yes, to some extend.** **For the subcontractor: Don't know, depends on the teams**
30. Defining Turf is important	**For the core-team: Yes, to some extend** **For the subcontractor: To a lower extend as the working area is already regionally defined**

Comment to Sub-Pattern 2:

As in general, routinized projects were favorized, there was not much leeway for risk taking and try-and-error behavior. Mistakes were allowed, but they were seen more as an unavoidable fact that happens during work and not as a chance to learn and improve.

Sub-Pattern 3 : Reward and Research Availability	**Assessment**
32. Availability of Funds	**Depending from the type of project: 100% financial support for all necessary hardware for congruent projects. Experimental projects exclusively planned and conducted by owner managers and financed.**
33. Problems with Company Budgeting Process	**No**
34. Additional Rewards / Compensation	**For the core-team: In general they have more administrative work and thus more standard remuneration.** **For the subcontractors: In general, the remuneration is Working hour-based**
35. Several Options for financial Support	**No**
36. Problem Solving with Co-Workers	**For the core-team: Fixed job roles, no real project problem solving process** **For the subcontractors: Depends on management practice of the sub-contractors**

4 Complementary Questions	**Assessment /Comment**
37. A open, trusting organizational Culture	**For the core-team: Agree** **For the subcontractors: Depends on the subcontractor history**
39. Less Bureaucracy	**Agree**
40. Teams are isolated in a separate Department	**Subcontractors in different locations**
41. Frequent use of cross-departmental Teams	**No**

42. Continuity of Team Taskforce during whole project (engineers, marketing, etc.)	**Yes**
43. Use of empowered Teams	**Yes, due to the subcontractor status**
44. Increased Employee Involvement in Design and Planning	**Not really**
45. A more active Employee Suggestion System.	**No**
46. Increased Employee Autonomy in Decision Making	**No**
47. Personal Career linked with project	**For core-team: No** **For subcontractor: Only indirect influence**
48. Personal Evaluation based on project success	**Same as point 47 above.**
50. Increased Employee Interaction with Customers and Suppliers	**NO**

Comment to Sub-Pattern 3 and 4:

If we interpret the assessments /comments that the major part of ULMOD.COM's project in 2001 have already routinized character, and depend critically on the timely fulfillment. At this stage, there is no place for failures, and there exists also an internal rating for the quality of the sub-contractors.

Due to that routinized character of the projects, there is also no increased involvement in design and planning. We could say that the increased empowerment of the employees happens during the operative project work not in preliminary actions like design.

8.2.2 Fit with the "Four-Type" Model

Table 8.2: ***ULMOD.COM Characterisation of Strategic Behaviour***

	Very Low Degree	Low Degree	Neutral	Notable Degree	Very High Degree
Defender				X	
Prospector					
Reactor					
Analyzer					

8.2.3 The Communication Channel Continuum

Table 8.3: ***The ULMOD.COM Communication Channel Continuum***

		Very Low Degree	Low Degree	Notable Degree	High Degree	Very High Degree
Rich Channels	***One-on-One / Face-to-Face Communications**				**X**	
	***** Hallway/Coffeepot Communications**				**X**	
	***** Small Group Meetings**			**X**		
	***Video Conferencing**	**X**				
	***Telephone Conversations**					**X**
	***** Voice Mail**			**X**		
	***** E-mail**			**X**		
	***** Large Group Meetings**	**X**				
	***** Handwritten Personal Notes**			**x**		
	***** Advanced Copies of Agendas**			**X**		
	***** Faxes**				**X**	
	***** Interoffice Memos**			**X**		
	***** Formal Speeches**	**X**				
	***Letters**			**X**		
Lean Channel	***Reports**		**X**			

Comment: Due to the fact that ULMOD.Com is a relative small firm, its internal communications and customer relations management are based more on traditional ways of communications. Telephone calls, informal meetings, face-to-face contacts have in the first line personal character.

8.3 The Economic Environment

ULMOD.COM is operating in an approximately 15 years old high-tech industry sector dealing with data transmission. Major technological changes happen every 5-7 years. But, in general, the development in the data transmission technology is carried out via small improvements relying on the existing cable infrastructure of the customers. Here, the direction of the development is not so ambiguous like for example in the CARMEDIA case.

The major entrance barrier had been the monopolistic status of the “German Post” for many years. Only recently, the market was opened for privat firms. Because of the fact that the development takes place in the first line through small improvements than through "quantum steps", such firms that could accumulate their knowledge could built up a crucial advantage over new entrants. ULMOD.COM was the first private firm that entered this market using this new technology and thus had a first mover advantage. Meanwhile, the firm developed a product and service portfolio that encompasses design and planning, technical installation, and maintenance service for own and foreign products.

8.4 The Consensus Building Process on Core-Capabilities and Competitive Advantage

8.4.1 Competitive Advantage of Products /Services

If we use Hall’s analytic framework, we have to consider the following product/service attributes that enable ULMOD.COM’s competitive advantage:

Price.....%
Quality.....%
Functionality.....35%
Aesthetics.....%
Availability.....%
Image.....%
After Sales Service.....25%
Innovation.....20%
Customer Convenience.....20%

=100

It will be possible but difficult for new firms to imitate those attributes due to the first mover advantage of ULMOD.COM.

8.4.2 Characteristics of Core-Capabilities

Consensus-building Process

The organization is well aware of its core capabilities which is demonstrated on the firms "internet web-site".

Core-Capabilities:

- The capability to apply state-of-the-art technology for the transmission of various types of data on one cable [Simultaneous transmission of Television, Radio, 10Mbit with one cable with plug and play compatibility][56]
- The capability to provide maintenance service for own and foreign communication technology due to the newest technological standards.

Table 8.4: ***ULMOD.COM Core-Capabilities***

1.First Core-Capability: Providing the Customer State-of-the-Art Technology Applications

Resource Type:	Percentage:
• ***Regulatory Resources:*** ***-Contracts / -License***	10%
• ***Positional Resources:*** ***-Accumulated Data*** ***-Internal Value Chain*** ***-Relation with Subcontractor***	20%
• ***Functional Resources:*** ***-Skills of Employees /-Skills of Subcontractor***	40%
• ***Organizational Capabilities:*** ***-Capability to Develop high Quality Standards*** ***-Capability to adapt to Chance***	

[56] For example: Simultaneous transmission of Television, Radio, 10Mbit with one cable with plug and play compatibility

-Capability to innovate ***-Capability to work with Teams***	30%

Second Core-Capability: Providing Customer specific Service and Maintenance

Resource Type:	Percentage:
• ***Regulatory Resources:*** ***-Service Contracts / -Licences*** ***-Customer Agreements***	20%
• ***Positional Resources:*** ***-Accumulated Data /Customer specific Data*** ***-Reputation of Product /Service*** ***-Reputation of Firm*** ***-Reputation of Subcontractor***	20%
• ***Functional Resources:*** ***-Skills of Employees / -Skills of Subcontractor***	35%
• ***Organizational Capabilities:*** ***-Capability to develop high Quality Standards*** ***-Capability to adapt to Change*** ***-Capability to work with Teams***	25%

Which Dimensions of the Core Capabilities need most of the firms resources:

Functional capabilities

Percentage of total Resources spent for experimental Projects: 2%

Products / Services:

ULMOD.COM 's service encompasses:

- The planning of projects
- The installation of technology
- The maintenance of technology

8.5 The Development Project Future-Com

8.5.1 The Strategic Context for the Project

- Financial Resources: As the production process is already routinized, ULMOD.COM provides only a restricted budget determined from past experience.
- Time availability: All the projects had a high time pressure.
- Risk factor: There was no big market risk, as the customer had been reliable from past experience.

8.5.2 The Management Practice

Analyzing ULMOD.COM's management practice, we found several issues that differ for example from our first case CARMEDIA. While CARMEDIA developed their products independently from customers expectations, ULMOD.COM had a long ongoing customer relations management even demonstrated on their official website. As a consequence, they could offer a huge after sales- and maintenance service that developed to a profitable new service portfolio, even for firms that bought the original products from the competitors.

According to our interview partner, one of the critical problems in the past was the fulfillment of time schedules. Often, very simple problems were delaying the project. For example, it is necessary to have access to the offices that should be integrated into the network. This could be very difficult if the project is in another city and there are many participants working with different time schedules.

According to the corporate management, the most effective way to carry out such projects is to delegate operational and functional issues to the responsibility of a regional sub-contractor, but to set fixed time schedules, and to guide the collaboration with other sub-contractors from the headquarter in Ulm.

8.5.3 The Underlying Technology of the Development Project

As described before, it is one of the core-capabilities of ULMOD.COM to use one already existing cable medium for different applications like phone, internet, TV, alarm-system etc. For this purpose there is a common used data transfer protocol, the so-called TCP/IP (already used as internet transfer protocol) for the lower and middle level data transfer. For the high performance data transfer there exists the so-called ATM protocol. Today's network standard is a band-with of 10Mbits per second for all end-user.

The network is based on interconnecting service points between different floors or departments (the so-called "backbones"). Between these service points, the data transfer takes place with a rate of 100Mbit/s. ULMOD.COM provides for their systems the possibility to adapt to future standards. The end-user connection could be improved to 100Mbit/s while the "backbone" transfer rate could be accelerated to 1Gigabits per second.

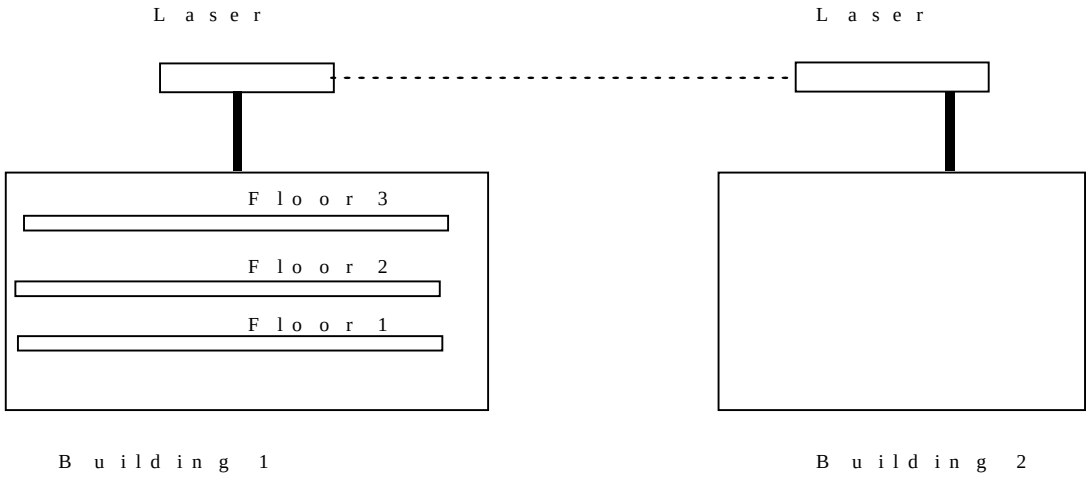
The project is based on three classes of networking components all included within a structured network:

Primary Network

The primary network defines the connection between different buildings, also called “Campus network”.

Here fiber optics connections are used as medium that tolerate higher differences better than normal cable [copper wire]. As alternative, especially for longer distances, laser technology is used, which allows also a high Gigabit transfer rate. This laser technology uses LED infra red signal which has the advantage that it provides a very secure transmission over several hundred meters. Semiconductor laser are used if the distance is over 500 meter.

Figure 8.2: ***Primary Network connecting different Buildings with Laser Technology***



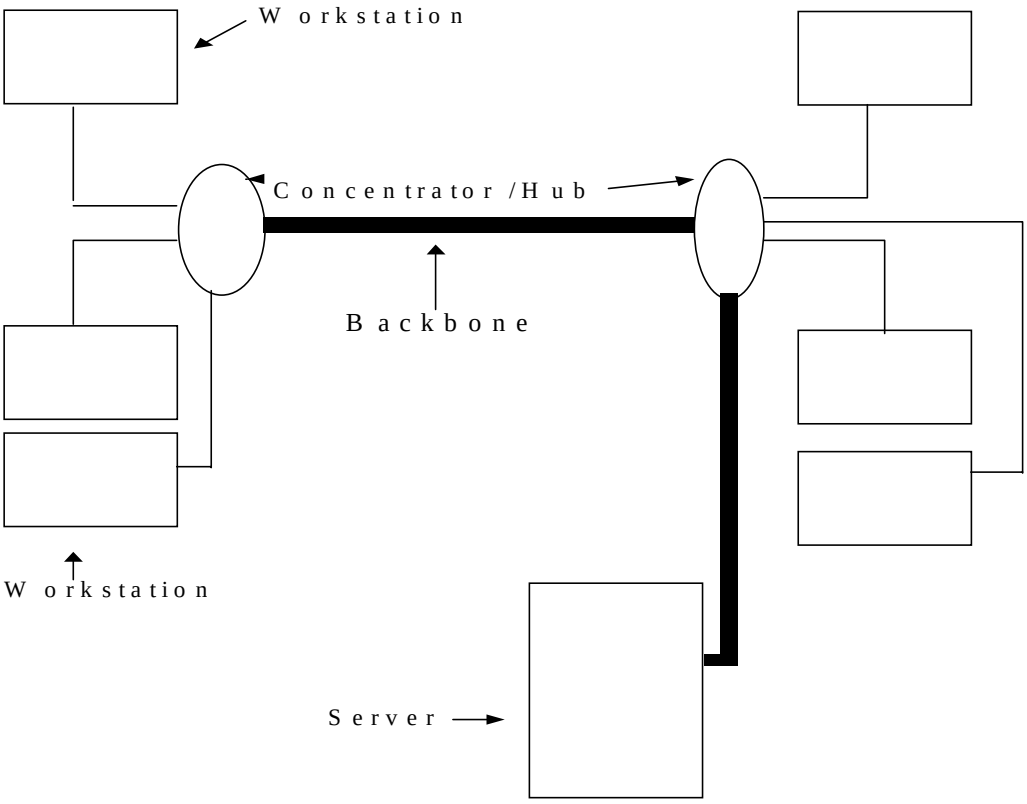
Secondary network

Connection of the different floors with fiber optics connection . There is one central connector on every floor with patch fields and active connecting elements.

Level three network

From every connector on every floor there is an outgoing network "hub" that allows all network topologies like 10/100Mbit, Token ring, etc.

Figure 8.3: ***Structured Network of Data Transfer on one Floor***



As we described above, ULMOD.COM's the rate of experimental projects is low in favor of routinized- and customer oriented projects. The "Future-Com“ project was such a customer requested project. The customer ordered a network installation for a complex building located in the south-west of Baden Württemberg. After a first pre calculation the order was confirmed and an engineer from the core-staff visited the site, an office complex with several departments on different floors. All offices should be connected with networking and communication tools.

After analyzing the building, the engineer planned the necessary steps how the project should be carried out. Using computer aided design program he estimated the workload, and the material needs. This is always depending to a great part of the existing cable infrastructure. As described before, one of ULMOD.COM's core-capability is the usage of old infrastructure for new state-of-the-art technology. Therefore, it makes a big price difference if there is an already existing cable system, which could already be used.

After the first planning phase, the corporate managers chose among the network of subcontractors the most appropriate one. This subcontractor received an exact time schedule for the different steps the project. ULMOD.COM provided all the necessary material like sender, receiver, modems, bought at special prices in high quantities. The subcontractor himself is responsible for the local planning and fine tuning with the end customer.

The work of the subcontractor and his team is continually supervised by the engineer visiting regularly the building.

8.5.4 Interference of Project with the Core-Capabilities' Subdimensions:

- ***Technology and Skills Dimension:*** If we consider the interrelationship between core-capabilities and development project from the technology dimension, we could state that ULMOD.COM applies innovative concepts and visionary technologies. But one of its key strategies is to built up on existing infrastructure at the customers site. For that purpose, all applied technology should be in the first line compatible to existing customer hard-and software.

  With regard to that need of compatibility, the firm's routines will support more the incremental technical improvements than experimental inventions. But nevertheless, the technicians and especially the owner manager are always testing the applications of new possibilities, while they are conducting a more "routinized project". A "quantum step" was the introduction of the so-called "broad band technology". The application of this technology developed as one of the cornerstones of ULMOD.COM's performance. For the last few years, the firm's major activities were directed in refining and testing this technology for broader applications and the compatibility to existing hard-and software. Their experience grew incrementally with every new project up to a routinized project initialization process. We could describe the primary focus of any development project as strongly customer oriented. That means, besides the testing of the every days functionality of the technology (especially when there are many end customers involved), the strategic focus is always on the acceptance of the end customers. That way, the functionality of any new initialization is strongly intertwined with customer behavior.

  Regarding the interrelationship of the project with the ***skill-dimension*** of the core-capability, there was no negative influence. This project is like former projects supporting the development of operational skills of the own task force and the sub-contractors. The necessary resources and training are offered from the corporate management, as well as routinized support from the coordinating teams at the headquarter.

- ***Interrelationship between Projects and Management Practice / Organizational Culture***: If we consider the influence of the dimensions "organizational culture" and "management practice" on the initialization of the "Future-Com" project, our findings are ambitious. We could describe ULMOD.COM's organizational culture as a mix of patrimonial and intrapreneurial orientations.

  Due to the fact that the firm has only a core staff of 15 employees, it has only few hierarchical levels and short communication ways, but also a strong dependance from the owner managers.

  With regard to the relation with the subcontractors, the situation is two-folded. The working-relation with the subcontractors is based on trust and self-responsibility often necessary due to the long distance to the customer. But on the other side the management has established clear working expectations, by setting quality standards and prescribing time schedules.

  Through that practice, the failure tolerance is very low. That way, it results that the subcontractor carry out in the first line congruent projects like in this case that bear no special risk.

8.6 Experiences from the Project: Retrospective View: General Impact of Development Project on Firm Performance

Summarizing, we could say that the findings go along the line with our theoretical propositions. Due to the congruent character of the FUTURE-COM project, there were only slight improvements for the core- capabilities of the firm, resulting form every day working experiences of the project team that goes into the knowledge pool of the subcontractors or could be integrated into the knowledge base of the firm.

Table 8.5: ***Assessing the Development of Competencies / Core–Capabilities after the Project:***

	Assessment / Comment
The project improved the meeting of budget objectives	Improvements according to a normal learning curve effect
The project improved the meeting of staffing objectives	Improvement more on the side of the subcontractor
The project improved the meeting of major deadlines	Average Improvement
The projects improved the meeting of quality objectives	"
The projects improved the meeting of reliability objectives	"
The projects improved the meeting of cost objectives	"
The projects improved the meeting of efficiency objectives	"
The projects improved the meeting of user/client satisfaction objectives	"
The projects improved the meeting service objectives	"
The project increased the organization's productivity	"
The project improved the organization's competitive position	"
The project increased the organization's profitability	"
The project improved the organization's revenues	"
The project improved the overall performance	"

There were the "normal" operational activities at the project level that led to an incremental improvement of the firm performance. A major improvement was made in the year 2000 when the firm made another reorganization and integrated another firm. We see it not in the first line as a change caused by the project but project highlighted the need for a further performance improvement. The main failure could were described as the same like in former projects as not being able to reach all the time schedules completely. This led consequently to coordination problems.

8.7 Appendix: Questionnaires handed out during the interviews

A) Out of which resources and competencies are your firm's first core-capability built?

First Capability : "*Providing the Customer State-of-the-Art Technology Applications"*

	1 . Category **Regulatory resources** **Protectable in law:**	**2. Category** **Positional resources** **due to previous endeavor:**	
80%	• Contracts	• Data bases	20%
20%	• Licenses	• Reputation of products/service	30%
	• Patents	• Reputation of company	30%
	• Copyright	• Value Chain configuration	
	• Trademarks	• Established distribution network	
	• Registered designs	• Others: Subcontractor	20%
	• Trade Secrets.		
100%			100%
	3. Category **Functional resources** **Due to skills & experience:**	**4. Category** **Cultural capabilities** **of the organization:**	
50%	• Know-how and experience of employees	• Ability to develop a high level of quality standards	25%
	• Know-how and experience of suppliers	• Ability to develop a high level of service standards	
	• Know-how and experience of franchisers /partners	• Ability to adapt to changes	30%
		• Ability to innovate	20%
	• Know-how and experience of customers	• Ability to assess the competition	
50%	• Others: Know-how of subcontractor	• Ability to work with teams	15%
		• Participative management style	
		• Learning organization	10%
		• Ability to provide entrepreneurial climate	
		• Others	
100%			100%

First core-capability profile:10%(Category 1)+20%(C2)+40%(C3)+30%(C4)

B) **Out of which resources and competencies are your firm's second core-capability built**?

Second Core-Capability: "***Providing Customer specific Service and Maintenance"***

	1 . Category Regulatory resources Protectable in law:	**2. Category Positional resources due to previous endeavor:**	
50% 25% 25%	• Contracts • Licenses • Patents • Copyright • Trademarks • Registered designs • Relation to customers	• Data bases • Reputation of products/service • Reputation of company • Value Chain configuration • Established distribution network • Subcontractors	10% 40% 40% 10%
100%			100%
	3. Category Functional resources due to skills & experience:	**4. Category Cultural capabilities of the organization:**	
60% 40%	• Know-how and experience of employees • Know-how and experience of suppliers • Know-how and experience of franchisors /partners • Know-how and experience of customers • Know-how and experience of Subcon-tractor	• Ability to develop a high level of quality standards • Ability to develop a high level of service standards • Ability to adapt to change • Ability to innovate • Ability to assess the competition • Ability to work with teams • Participative management style • Learning organization • Ability to provide entrepreneurial climate • Others	25% 50% 25%
100%			100%

Second core-capability profile:20%(Category 1)+20%(C2)+35%(C3)+25%(C4)

CHAPTER 9: CROSS-CASE COMPARISON BASED ON PROPOSITIONS AND RESEARCH QUESTIONS

In the following chapter we will conduct a qualitative cross-case comparison of our four case-studies. We engage to find similarities across the particular cases that should deepen our understanding of development processes.[57] Referring to cross-case comparisons, **Miles** & **Hubermann** argue that "***multiple cases not only pin down the specific conditions under which a finding will occur but also help us form the more general categories of how those conditions may be related***" (1994: 173).

As described in the methodological chapter before, we are applying the ***pattern matching logic*** for our analysis. As **Yin** points out, the pattern matching logic compares an empirically based pattern with a predicted one. If the pattern coincide, it supports the case-study's internal validity. For the building of our theoretical pattern, we oriented on pattern constructs that already had been proven to be a reliable indicator for the phenomena we want to measure. Here we applied the "***Intrapreneurial Assessment Instrument***" for the assessment of the intrapreneurial climate of an organization, and the "***Total Quality Management Performance Survey***" as a measurement indicator for the firm performance.

Our cross-case comparison is based on the theoretical propositions that we introduced in the first chapter and that we will discuss more in detail below. The comparison is also following some key questions that are related to the proposition statements.

General Proposition:

As general statement, linked to the resource-based view, we argue that for a successful performance of the firm in the long run, the entire organization has to understand in-depth its distinctive resources and capabilities and has to apply them as an ownstanding component of strategy.

[57] We do not have statistical evidence in mind but try to find common pattern of behaviour

9.1 Research Focus: Explicit Awareness of Core-Capabilities <=> Effective Project Development

Proposition 1: ***Firms that are "explicitly aware" of their core-capabilities are successful in managing various kinds of development projects and thereby sustaining their competitive performance in ambiguous industry sectors.***

We formulated this proposition presuming a positive relation between the application of capability-based strategies and the firm's performance. Under the term "explicit awareness", we understand that the corporate management initiates consensus building activities and establishes communication processes throughout the whole firm to determine and explain the firm's strengths to all employees.

Constructed Research Pattern:

I) Constructed pattern for "explicit awareness": We assume that we would find in a firm that has established a high level of awareness the following issues:

- Visible consensus building process activities from corporate management /project managers
- Existing communication tools / activities throughout the whole organization including all hierarchies (+ extraordinary budget/support for such activities)
- Explicit reference of core-capabilities in formulated visions /mission statement

II) Successful projects: We understand under the term "successful", if the project had a positive long-term influence on the firm performance.[58]

Pattern Matching Logic: We expect a high rate of successful projects, if we could find strong empirical evidence of our pattern "explicit awareness" of core-capabilities.

For a deeper focus, we raise also the following questions at a **cross-case level**, according to **Yin** the so-called "**level-3**" questions:

- Are core-capabilities playing a crucial role by formulating the short- and long-term strategies in the respective firms? (Are they used exclusively as the key strategy?)
- How do companies establish consensus building processes and communicate internally the value of their core capabilities?

[58] Our subjective ratings follow the logic of Ancona & Caldwell (1992) who state: "We use subjective ratings of performance because these ratings are most often used to make budget and promotion decisions, they are rated to final performance evaluations, and more "objective" results are often a product of "subjective" ratings".

9.1.1 Case-Study: CARMEDIA

An example for a firm that focuses exclusively on its core-capabilities is CARMEDIA. The management was so confident in its vision and capabilities that it initiated the project without any feedback from potential customers. The management did not use other strategies. Today, with a retrospective view after two years, we can prove that this strategy worked very well and out of the first project outcomes developed a broad portfolio of multimedia products.

Within CARMEDIA, we could find a good communication of core-capabilities through all levels. If we consider the firm's development path, we can highlight that from the very beginning there was a special attention to the firms capabilities to provide and guarantee the high quality standard. As our interview partner remarked, everybody in the team is knowing about the firms capabilities and visions. This consensus helps also to protect critical knowledge. CARMEDIA is protecting its know-how with the help of so-called "disclosure" agreements on those critical points. For this reason, the management prefers to undergo short time contracts with external employees before establishing deeper interfirm collaborations.

We found that the focus on quality already started at the mother firm CR-TRONIC, where the symbol of that high quality standard became the trade mark and later the company name. As it was described before, "problem-solving" activities laid the fundament of the core-competencies and capabilities.[59] These strengths were communicated throughout the company and our interview partner had no difficulties to enumerate them.

According to our interview partner, the rate of successful projects is very high, around 85% of the projects that the firm carries out alone are successful. The rate decreases to 70% when the projects are carried out in collaboration with others. This is explained due to coordination problems with the other firms. Among those projects, the percentage of incongruent projects is described as being high.

9.1.2 Case-Study: RECEIVE-TECHNOLOGIES

After an internal assessment process, the firm discovered that the rate of their successful initiated projects was rather low. To improve this situation, the corporate management of RECEIVE-TECHNOLOGIES first initiated a consensus building process on their corporate strengths and weaknesses. For this purpose, they involved the first three management hierarchies. As our interview partner (an involved project leader) explained, this consensus building process reached also the highest

[59] Miniaturization; integration technology; innovativeness.

operational level. It was assumed that from here it would be communicated automatically through the everydays work processes.

RECEIVE-TECHNOLOGIES applied benchmarking and target costing models and in addition to this "inner focus", it also watched the market developments in this industry sector. Additionally, based on its core-capability profile, it is also looking for appropriate alliance partners.

As we described in the case-study, due to the explicit demonstration of its capabilities and competencies, the firm received the admittance to a subproject within an international collaboration. RECEIVE-TECHNOLOGIES was selected because its core-capabilities had been complementary to the collaborative firms.

Meanwhile, the management and team members have built consensus on their core-capabilities. Future assessment of project performance will show if the firm could improved its rate of successful projects after it re-arranged and focused its strategy. To improve its organizational processes, the management has established the ***Competence Center*** that is coordinating all the internal development activities.

9.1.3 Case-Study: COMPUTEX

The corporate management of COMPUTEX is well aware of its core-capabilities. Consensus was built within workshops and corporate meetings and then communicated through all hierarchies with the help of the intranet, firm brochures and emails. Based on these capabilities, COMPUTEX seeks to complement them by buying and integrating constantly other firms with different capability potential. Recently, the corporate vision was clearer defined to better express COMPUTEX's strategic focus. These strategic guidelines could now be found everywhere, even printed on coffee cups and computer mouse pads.

Among our case-studies, COMPUTEX is facing the strongest competition and therefore demonstrated the highest awareness for structural changes and applied a broad range of strategic tools. With the help of benchmarking tools it permanently compared the rentability and gross profit, being well aware of its competition. In general, the rate of successful projects is estimated as being high. Referring to the latest project, it could be described as a great success in the short run, but after one year the strategic context had to be adapted, because there were occurring negative effects in the organizational culture.[60]

[60] Described in the COMPUTEX case-study.

9.1.4 Case-Study: ULMOD.COM

Also the corporate management of our forth case-study ULMOD.COM focuses on its core-capabilities, but not as clearly as the other firms of our sample. But in this case, the management focuses intensively on its customer relations (CRM[61]) which is demonstrated on the firms internet homepage. Here, we could find besides an explanation of all elements comprising the firm's capabilities, a reference to successful projects and customers.

The corporate management does no explicitly communicate its capabilities. This happens more through teamwork and tacit knowledge transmission, with the help of internal and external teams and sub-contractors.

The rate of successful projects was rated as very high, but this result could not causally be linked to the explicit awareness of the core-capabilities. We see it more related to the routinized character of project fulfillment and the standardized character of the projects.

[61] CRM: Customer Relations Management

9.2 Research Focus: Intrapreneurial Context supporting Core-Capability-Based Strategy

Proposition 2: ***An intrapreneurial context supports the realization of incongruent development projects that depart from the firm's traditional core-capabilities.***

We argue that besides the first two pre-requisites for the application of a core-capability-based strategy (a) ***the concept of consensus building*** and (b) ***the communication process***, there is another important issue (c) ***the building of a supporting strategic context.*** An appropriate strategic context should allow on the one hand to provide the project members the possibility to act with self-responsibility and empowerment, but nevertheless it should on the other hand provide guidance and targets the team can follow during and after the project realization.

Constructed research Pattern:

I) The intrapreneurial context pattern: As we described before, we use the intrapreneurial assessment instrument, developed by **Kuratko** *et al*. (1990). This questionnaire includes variables that have proved to be a reliable indicator for the existence of an intrapreneurial context.

II) High rate of successful projects that depart from traditional strengths.

Pattern Matching Logic: Following literally our proposition, if a firm has a high rate of successful projects that depart from the traditional core-capabilities, we suppose to find also intrapreneurial variables indicating the existence of an appropriate intrapreneurial context.

Cross–Case Level-3 Questions:

- With regard to **Miles** & **Snow**s' four organizational types (***defender, prospector, reactor, analyzer***), which type's characteristic describes best the structure of our investigated firms; here, we are also interested if there are further intermediate types.
- How is the strategic context provided through the project structure[62]

[62] Bowen *et al*. differ between: "Functional" Structure, "Lightweight" Project Structure, "Heavyweight" Project Structure, "Focused Singular-Purpose" Team.

9.2.1 Case-Study: CARMEDIA

As our interview partner remarked, CARMEDIA's organizational climate may be described as very open and fostering entrepreneurial activities. It matches in nearly all cases our first constructed entrepreneurial pattern. As we described at point 5.3., the existence of the following contextual attributes was strongly agreed:

- An open, trusting organizational culture.
- Less bureaucracy.
- Use of empowered teams.
- Increased employee involvement in design and planning.
- A more active employee suggestion system.
- Increased employee autonomy in decision making.

Following **Miles** & **Snows'** typology, CARMEDIA has in the first line characteristic traits of the so-called "PROSPECTOR" typ. The firm is always engaged in new opportunities and their emphasis on "autonomous" strategic behavior is very high. Therefore, a strategic context that enables autonomous thinking and acting is seen as being appropriate for the firm.

With regard to the project structure, it has characteristics of **Bowen's** socalled "Focused Singular Purpose"- team. As described before, the team members are remaining the whole time addicted to the project and are physically separated from the other workforce. They have personal freedom in decision making, especially with regard to their working hours and task fulfillment. They are empowered within certain limits with regard to their problem solving decisions. They have free time to follow their own ideas and their own solutions but these solutions should have the potential to be integrated into the overall project.

The rate of successful initiated projects was described with 85% without alliance partners. Among those, there had been a high percentage of projects that depart from traditional strengths.

We argue that the findings of this case may corroborate our second proposition. We have got a positive confirmation of the existence of several entrepreneurial context attributes at CARMEDIA, and there is also a high rate of successful projects that depart from traditional strengths.

9.2.2 Case-Study: RECEIVE-TECHNOLOGIES

Using the criteria of the intrapreneurial instrument, we found the following characteristics: The corporate management has experience with innovation as they are always concerned with state-of-the-art technologies. It encourages also for activities in entrepreneurship programs. It makes sponsorship using different budgets. There was more support for intrapreneurial projects in the past, but it still exists. Financing experimental projects had seldom been a serious problem at RECEIVE-TECHNOLOGIES. In general, the quality and personal traits of project leaders and their influence on projects is recognized from the management., but at the moment its strategy is more process-oriented, to give every project leader the same prerequisites and support. It could be also agreed that:

- There are second chances after mistakes.
- Mistakes are seen as learning experience.
- There is an open, trusting organizational culture.
- Continuity of team taskforce during the whole project.
- Teams are empowered
- There are various options for financial support.
- The team members have enough time for problem solving activities.

To a certain extent, there is a concern for the team's working area (turf) and their job descriptions. Also to some extend, the personal career is linked with the project, but as the team members remain to 20% within their old job-roles, the probability is high that they return into their former roles after this project. With regard to the working area, the team was relocated in a separate department and the team members engaged to 80% in the new job roles. The corporate management is aware of the benefits of an entrepreneurial climate and additional resources had been provided to establish an entrepreneurial culture. As our interview partner explained, in the past, there was sometimes no given target that should be achieved and this led to uncontrolled expenses.

As we described at point 6.3.2, the firm's former characteristics were going mostly align with the DEFENDER type, but the management's long-term strategy is to change the organizational structure towards a form that resembles more the ANALYZER or the PROSPECTOR type. For this purpose, the firm changed its project work structure form a functional structure to a singular focus team.

Pattern Matching Result: We could not confirm sufficiently our second proposition at this stage, as the organizational structure was recently changed together with the introduction of the APA-I project and the project is still ongoing. The entrepreneurial context was reconsidered and revised towards more goal orientation, as it has been evaluated that the original context resulted in an inefficient use of the resources.

9.2.3 Case-Study: COMPUTEX

Considering COMPUTEX organizational climate at point 7.3.1, the existence of the following contextual attributes could be strongly agreed /agreed by participating observation:

Strongly agreed:

- The corporate management has experience with Innovation
- There is a second chance after mistakes
- Mistakes are seen as learning experience
- Existing Budget for experimental project

Agreed:

- Senior managers encourage to "play" with rules
- Management encourages for project activities
- Individual risk-takers are recognized whether eventually successful or not
- Management encourages for calculated risk
- Small and experimental projects are supported
- Risk taker is considered as a positive attribute
- Defining turf is important
- Additional rewards / compensation is available
- Problem solving with co-workers is possible
- An open, trusting organizational culture
- Teams are isolated in a separate department
- There is a frequent use of cross-departmental teams (especially referring to the controlling teams)
- Use of empowered teams (depending from departments)

With regard to **Miles** & **Snows'** typology, COMPUTEX matches to a high degree the organizational characteristics of the "PROSPECTOR" type. Like in the CARMEDIA case, the firms strategic context should support selfresponsibility and commitment. COMPUTEX's attempt to develop a more trusting organizational culture was supported from the new CEO, who was hired from an organization with a high intrapreneurial culture.

The MARGIN-20 project itself was structured in several autonomous project groups. The programming team was completely separated with own facilities, the controlling team shared the same building and was located in the middle of the different product units.

In general, COMPUTEX has the experience to carry out successful process changes. With regard to our focused project, we could say that this incongruent project was very successful in the short run but after approximately one year, the missing entrepreneurial empowerment in some involved departments lead to a decreased performance and employee fluctuation. It interfered extremely with the personal traits of the employees, especially with those who had a long working experience. The corporate management recognized these critical issue and re-organized that process by giving the departments a certain "frame" within which they could make their own independent decisions.

9.2.4 Case-Study: ULMOD.COM

At point 8.2.1, we described the organizational working conditions as two-folded. On the one hand, the firms operating activities are directed by the two owner-managers, who give clear prescriptions. This is contrasted by a flat organization structure, short bureaucratic decision and a good team atmosphere. In general, it could be agreed that the corporate management has experience with innovation (in spite of the fact that the rate of experimental projects is relative low). The managers are holding contacts with the F&E departments of the near Universities, and any experimental "activity" is promoted and conducted in the first line by themselves.

The organization structure could be virtually enlarged, including also the subcontractors, who are mainly working for ULMOD.COM. We considered this "special" situation also in our assessment categories and distinguished between the context for the core-staff and the context for the subcontractors. If we summarize the results of the intrapreneurial categories, there is positive evidence for an intrapreneurial climate only in a smaller range of items:

For the core-team:

- Second chances after mistakes, but depending on the personal history.
- Mistakes as learning experience, to a certain extend, but as the projects have more routinized character, its more critical.
- No difficulties to form teams, as the core-staff (15 employees) was described as operating as one team.
- There is an open trusting organizational culture with strong communication between management and core-staff.
- Less bureaucracy.

For the subcontractor:

- Relative freedom of operational day-to-day decisions due to the distance to the ULM headquarter.
- No problem with budget as it is al pre-financed.
- Less bureaucracy.
- Continuity of team taskforce during the whole project.
- Personal career / follow up order is linked to the project.

As routinized projects were supported in favor of incongruent ones, there are no possibilities for "try and error" strategies. Like in a "normal" business relation, the subcontractors should fulfill the projects in a timely manner with a high quality standard. Unsuccessful projects are not seen as long-term chance for learning, but would have negative consequences for the subcontractor.

Organizational Type

The firm matches mainly the characteristic of the DEFENDER type. It is highly expert in the communication sector, and there are few projects with experimental characters.

Project Structure

Due to the subcontractor concept, the management delegated all the team planning issues and responsibility to the subcontractor and only tracks the project outcome.

Pattern Matching

In this case, we could not confirm our second proposition, because of the lack of projects with incongruent character. As our interview partner explained, we should speak more of experimental "activities" than complete projects. Form time to time, one of the owner managers, together with a technician are testing a new technological feature or improvement at one of the project sites, but it has not the dimensions of the projects that are normally conducted. The high rate of successful project could not be causally linked to the explicit awareness of the firms core-capabilities neither to an appropriate entrepreneurial context. It is more due to the routinized character of project work and the strict prescription and high pressure from the management to fulfill the scheduled plans. Because of the subcontrator status, the teams are under much higher pressure to deliver good results, because the firm could make the next business with others.

9.3 Research Focus: Relation Incongruent Project <=> Sustainable Firm Performance

Proposition 3*: Development projects that depart from the traditional core-capabilities of the organization are an effective tool for the further development of the firm's performance envelope.*

Descriptive Pattern Matching Logic:

1) We presume positive changes in the various subdimensions (i.e. structure, culture) of the organization's core-capabilities in the long term, if the project was successful.

2) Existence of follow-up projects: We suppose hat follow-up project are initiated if the first (incongruent) project was evaluated as a positive contribution to the firm performance.

Cross-Case Research Questions (Level 3)

- Was there a consensus at the corporate management level that incongruent projects will improve and maintain future performance?

- Retrospective View: How is the project outcome translated into firm performance

9.3.1 Case-Study: CARMEDIA

In the case of CARMEDIA, we could find this consensus at the corporate level that incongruent projects, properly managed, may sustain future performance. The corporate management gives each team member 10-15% of his/her time for experimental usage. Moreover, it never prescribes the way how to reach a certain target also for the everyday projects.

The long-term vision of CARMEDIA was that its products should offer multimedia and telecommunication features. As the impetus of most projects was technologically driven and not as response of customer demand, there was a certain risk that the engineers' ideas would not generate profit in the long run. But, two years after our interviews, we can find an evolution of products based on that strategic vision and technology. CARMEDIA took most profit from Project CHIP9597, the impetus from this project came also from the technological side. Before this project, the development teams did not have sufficient knowledge to design and apply own chip-technology. There was no experience how to design a chip. After the project, the team had learned how to apply this technology. Meanwhile, there are existing guidelines and processes how to carry out a project. This includes for example how to

make project proposals, how to administrate a project, how to apply for resources, how to present the project, etc.

Based on this developed routines and capabilities, any follow-up projects can be processed with much less efforts and mistakes and shorter product development time. As CARMEDIA already established a strategic context that is supporting entrepreneurial initiatives, there was no remarkable influence or change in the corporate culture, caused by the project.

Summarizing, we could highlight that Project CHIP-9597 gave the strategic direction and laid the fundament for a broad portfolio of products and crucially sustained the firms competitive advantage. While it enlarged the know-how and performance crucially, it did not change the organization's structure and culture.

9.3.2 Case-Study: RECEIVE-TECHNOLOGIES

With the APA-I project, the corporate management had crucial changes in mind, planning the project as a change agent. The project was initiated to improve the management practice and to change the firm's complete project development process. At the time of our empirical field research, this project was still ongoing.

With a lot of managerial and financial support, there was a change from functional to project structure, which was set in praxis and tested with the first project. Here, the target was to combine the positive creative influence of teams with the new institutionalized processes. Due to this project the teams established a catalogue of guidelines how to conduct a project and to transform experimental technology into commercially applicable technology. Going align with this was the invention of a tracking and performance measurement for sequential steps of project development.

Besides the guidelines for project management, the firm developed the organizational capability to work with cross-departmental teams. For this reason, there was a need to create a strategic context that fosters commitment and self-responsibility.

As the project is still ongoing we could not estimate completely the influence on the firm performance, but we argue that the new orientations have an inherent potential for improvements.

9.3.3 Case-Study: COMPUTEX

Also in this case-study, the project was used as a change agent. The firm accomplished together with the project the centralization of all small marketing departments at the headquarter, the upgrading of the software program with margin control functions, and the training of the whole workforce.

As already described, the project was successful in the short term, but beard a slowly increasing dissatisfaction in the daily working relationships due to different authorization levels between the headquarter and the different sales departments. While the firm gained in short term profitability, it lost its most experienced employees who disagreed with the restrictive working conditions. That way, the follow up business was in danger. Now, after two years after the project, the authority in margin issues (but also the responsibility) is given back to the respective departments for the daily business, but the headquarter keeps the overview through weekly margin reports.

Furthermore, new corporate visions and mission statements were communicated fostering intrapreneurial thinking and activities. Another change was the introduction of a common evaluation system both for marketing and sales. This was very often the reason for antagonious decisions and conflict between those departments.

As we described at point 7.6.3 (p.166), the MARGIN-20 project caused crucial changes in the organization's structure, and also changes in COMPUTEX organizational values like its "collaborative culture", "personal empowerment", and "entrepreneurial spirit".

As we could observe:

- The project improved the meeting of budget objectives
- The project improved the meeting of staffing objectives. Here, the project challenged the management to link and re-link tasks to people.
- The project improved the meeting of major deadlines. Here, the planning capability to meet time prescriptions improved as well.
- The project improved the meeting of cost objectives. Here, due to tolerant objectives, relative easy to fulfill.
- The project improved the meeting of efficiency objectives. Here, in the short run, efficiency was improved.
- The project improved the organization's competitive position. Here, the project improved the competitive position as it provided the management with controlling tools that could be used to cope with various challenges.
- The project increased the organization's profitability. The improvement was measurable through weekly reports.

Referring to our proposition, the project challenged the organization to a high extend, but layed the fundament for an improved competitive position for future needs. With regard to the profitability, the success of the project could be tracked and demonstrated with ROI statistics, before and after the project.

9.3.4 Case-Study: ULMOD.COM

ULMOD.COM had the most continuous development with no notable extraordinary changes caused by their projects. The firm did not undergo dramatically new incongruent projects in the near past and during the time of our investigation. In the same way, the strategic context was not changed drastically.

The firm is practicing a strong customer relations management by extending its core-capabilities with maintenance and service capabilities. For this purpose, the firm has to develop and apply technologies that are in the first place compatible with the existing customer hard- and software. Due to those circumstances, new incongruent projects have a lower status than the more applicable ones.

Furthermore we could not prove that there was a consensus at the corporate management level that incongruent projects would improve and maintain future performance. In this case, we could not find support for our proposition.

9.4 Summary: Confirmation and Rejection of the Propositions

Table 9.1: ***Confirmation and Rejection of the Propositions 1-3***

PROPOSITIONS	CARMEDIA	RECEIVE-TECHNOLOGY	COMPUTEX	ULMOD.COM
Proposition 1: **Firms that are "explicitly" aware of their core-capabilities are successful in realizing various kind of development projects, and thereby sustaining the firm performance in fast changing industry sectors.**	**Confirmation of Proposition 1:** High level of explicit awareness and good communication of capabilities go together with a high rate of successful projects.	**No Confirmation:** Now all management levels down to the first operational level are involved in the consensus building process. Bad project performance in the past without this consensus building activities.	**Confirmation of Proposition 1:** Consensus was built through the whole firm hierarchies. High rate of successful projects.	**Partly Confirmation of Proposition 1:** Explicit awareness and high rate in successful projects.
Proposition 2: **An intrapreneurial context supports the realization of incongruent development projects that depart from the firm's traditional core-capabilities.**	**Confirmation of Proposition 2:** High ratings in intrapreneurial assessment instrument and high rate of successful incongruent projects.	**Indirect (theoretical) confirmation of Proposition 2:** Low rating of appropriate strategic context in the past and bad project performance	**Indirect (theoretical) confirmation of Proposition 2:** Individual empowerment was decreased for some departments as a side effect of the project. In the long run, this led to an decrease in performance.	**No confirmation** High rate of successful projects but no projects with incongruent project character.
Proposition 3: **Development projects that depart from traditional core-capabilities are an effective tool for the further development of the firm's performance envelope.**	**Confirmation of proposition 3:** Project departed from the traditional strengths of the firm and forced to create new capabilities that enabled in the long run a broad product line of products	**Confirmation of proposition 3:** Complete restructuring after the project	**Confirmation of proposition 3:** Successful project, with huge impact on structure and performance.	**No evaluation possible**

CHAPTER 10: THE MANAGEMENT OF DYNAMIC CORE-CAPBILITIES AND THEIR INTERACTIONS WITH DIFFERENT TYPES OF DEVELOPMENT PROJECTS

In the following chapter we are going to describe the management practice and strategic contexts that our case-study firms applied/created to enhance their core-capabilities with the help of development projects. Positive interactions between project and capabilities should be catalyzed, while negative interference should be mitigated. These findings may be used to build or complement a frame of reference that enables a firm to apply the concept of core-capabilities as competitive strategy, so to speak to build a ***core-capability-focused*** organization. Our cross-case report is structured according to the following key-issues:

- ***The self-analysis and consensus building processes on core-capabilities:***
  -The description of the capability assessment process: Which are our core-capabilities and which resources do we need to build them?
  -The building of explicit awareness of core-capabilities throughout the organization.

- ***The building of a strategic context for intrapreneurship, team work and a learning organization:***
  -For a successful capability development, how may the corporate management provide the strategic context that supports congruent and incongruent projects?
  -How do firms manage the negative interactions of core-capabilities and development projects?

- ***The creation of long-term visions and short-term mission targets and their alignment with the overall organization:***
  -How are visions operationalized and communicated?

- ***The management practice of internal/external project integration:***
  -Does the management consider on the one hand the internal project coordination, and on the other hand the alignment with the whole organization?

- ***The analysis of the transformation process of project outcomes into firm performance.***

- ***The application of capability-based strategies:***
  -How does the management balance the development of different classes of capabilities**?**

10.1 Analysis of the Core-Capability Profile: Building Awareness and Consensus on Core-Capabilities

10.1.1 Analysis of Competitive Advantage

The first step of our analytical objectives was to build a core-capability profile of each our case-study firms. With the help of our interview partners, we wanted to highlight the self-analysis and consensus building activities and to determine those processes and/or assets, where the respective firms were distinguishing themselves from their customers. These assets/processes need to have the potential to sustain the firms' competitive advantage in ambiguous fast changing economic environments.

For this purpose we were applying **Hall's**[63] analytic framework, assessing the respective percentage of the following product/service attributes that enable the firms' competitive advantage. Here the question is also how easy/difficult it would be for a competitor to imitate these attributes.

Table 10.1: ***The Possibility of Imitation of Competitive Attributes***

Resource Profile:	**Easy**	**Certain Efforts Necessary**	**Difficult**
Price.....%			
Quality.....%			
Functionality.....%			
Aesthetics.....%			
Availability.....%			
Image.....%			
After Sales Service.....%			
Customer Convenience.....%			
Innovation.....%			
100%			

10.1.2 Consensus Building on the Firms' Core-Capabilities

According to **Prahalad & Hamel** [64], the corporate management should not rate more than 3 capabilities as core-capabilities. Other types like basic- and support-capabilities may in certain circumstances sustain the competitive advantage for a certain period, if the core-capabilities had been made ineffective by competition.

[63] HALL, R. (1993): "A Framework Linking Intangible Resources and Capabilities to Sustainable Competitive Advantage", in *Strategic Management Journal*, Vol.14, pp. 607-618.
[64] PRAHALAD, C. & HAMEL, G. (1990): "The Core Competence of the Corporation", in *Havard Business Review*, May-June, pp.79-91.

The next step after the consensus building process is the assessment of the tangible and intangible "bundles" of resources that are building these capabilities.

Table 10.2: ***The Determination of Resources out of which the Core-Capabilities are built***

I) Regulatory Resources	**II) Positional Resources**	**III) Functional Res.**	**IV) Organizational Capab.**
• **Business Secrets** • **Patents** • **Licenses** • **Copyrights** • **Trademarks** • **Registered Design** • **Etc.**	• **Reputation of Product** • **Reputation of Company / Mother firm** • **Value Chain Configuration** • **Established Distribution Network** • **Governmental / Regional Support** • **Etc.**	• **Skills of Employees** • **Suppliers** • **Franchisers** • **Distributors** • **Franchisees** • **Etc.**	• **Capability to Develop high Quality Standards** • **Capability to innovate** • **Capability to work with Teams** • **Participative Management Stile** • **Learning Organization** • **Capability to adapt to Changes**

The respective contributions of particular resources (out of the four resource categories) to the building of the core-capability could be summarized as core-capability profile. That way the respective firms can be strategically compared with each other i.e. for the building of efficient strategic alliances etc..

Example of a Core-Capability Profile:

First Core-Capability =10 % (Regulatory Resources) + 30% (II) +50% (III) + 20% (IV)

Second Core-Capability =_____% (I) + ____% (II) + ____% (III) + ____% (IV)

Third Core-Capability =_____% (I) + ____% (II) + ____% (III) + ____% (IV)

10.1.2.1 The Core-Capabilities of CARMEDIA

According to the estimations of our interview partner, the firm's competitive advantage is based on the "Image" (10%), "Price" (20%), and the "Innovativeness" (70%) of it's products. The "key" attribute "Innovativeness" is achieved by young motivated engineers, hired directly from the universities. The product- and technology portfolio is based on the latest chip developments and its respective applications. In addition new projects and ideas were supported by at least 5 years of accumulated firm know-how in this sector.

CARMEDIA's core-capability could be described as "***the capability to provide the customer with state-of-the-art products combining innovative features and using extremely minimized installation space"***. The corporate management and all hierarchies are well aware of this core-capability. The consensus on the core-capability was built during a continuous evolutionary process. It is updated and communicated through monthly meetings and the everyday team work. By building this core-capability, there was a strong focus on the development of functional skills but also on the improvement of the team working culture.

Core-Capability Profile CARMEDIA:

Core-Capability = 15% (Regulatory Resources) + 35% (Positional Resources.) + 25% (Functional Resources) + 25% (Organizational Capabilities)

10.1.2.2 The Core-Capabilities of RECEIVE-TECHNOLOGIES

The competitive advantage of RECEIVE-TECHNOLOGIES products and services is based on "Quality", "Functionality", "Service", "Innovation", and "Customer Convenience" (it was estimated that all factors were contributing with the same percentage of 20%). This advantage was built over a long time period, and due to that there are now high entry barriers for this market. According to our interview partner, new entrants have to invest a high amount of money and know-how to develop the same level of production technology. There were two core-capabilities defined in a consensus building process, in which the upper hierarchical levels (including the highest operational level) were involved. The core-capabilities had been defined as:

1st Core-Capability: The development and production of customer specific state-of-the-art systems in the field of information technology.[65]
2nd Core-Capability: Providing customer specific maintenance and testing service.

These core-capabilities result from system specific knowledge, development- and testing experience, as well as from the long relationships with customers. The development of the applied technology was estimated as highly cost intensive.

Core-Capability Profile RECEIVE-TECHNOLOGIES:

1st Core-Capability: 10% (Regulatory)+ 30% (Positional)+ 35% (Functional) + 25% (Organisational)

2nd Core-Capability:25% (Regulatory)+ 25% (Positional)+ 25% (Functional) + 25% (Organisational)

[65] See also Microwave/Milli Meterwave Module-Engineering, Manufacturing & Service

10.1.2.3 The Core-Capabilities of COMPUTEX

In the case of COMPUTEX, the following product/service attributes enable the firm's competitive advantage: "Price"(40%), "Availability"(40%), "Innovation"(10%), and "Customer Convenience"(10%). One crucial attribute for the firm's products is the price. But, this attribute is at the same time the most affected one, because it can be erased from everybody with a stronger financial background. As a general business agreement in this industry, the supplier firms are offering the same price for the same quantities to everyone (unless the price is protected by a registered design). Protectable in a better way are the attributes "Availability", "Innovation", and "Customer Convenience", because these attributes result from a complex organizational and logistical performance.

COMPUTEX core-capabilities are focused on the one hand on ***logistical services,*** on the other hand on ***demand creation*** with the help of its engineering teams. COMPUTEX core-capabilities enable the following value added processes:

1st Core-Capability: Design Service & Demand Creation: COMPUTEX design services supports Electronic OEM customers by helping them in their development activities for leading edge, high technology products.[66]

2nd Core-Capability: COMPUTEX logistical ***Integrated Material Service*** (IMS): The Integrated Material Service teams are engaged to provide world class supply-chain management service to electronic OEMs and contract manufacturers.

As described before, in terms of the consensus building process, the corporate management of COMPUTEX oriented itself on the core-capabilities of its American mother firm, but being aware of the idiosyncrasies of the European market.

Core-Capability Profile COMPUTEX:

1st Core-Capability: 25%(Regulatory)+ 25% (Positional) + 25% (Functional) + 25% (Organizational)

2nd Core-Capability: 20%(Regulatory)+ 30% (Positional) + 20% (Functional) + 30% (Organizational)

[66] In addition, they are brought faster to market using the leverage effect of COMPUTEX technical resources.

10.1.2.4 The Core-Capabilities of ULMOD.COM

The competitive advantage of ULMOD.COM's products/services is based on "Functionality"(35%), "After Sales Service"(25%), "Innovation"(20%), and "Customer Convenience"(20%). According to our interview partner, it will be possible, but difficult for new firms to imitate those attributes.

With regard to the consensus-building process, the organization is well aware of its core capabilities and highlighted them on the firm's internet web-site. The following core-capabilities were determinated:

1st Core-Capability: The capability to apply state-of-the-art technology for the transmission of various types of data on one cable.[67]

2nd Core-Capability: The capability to provide maintenance service for own and foreign communication technology due to the newest technological standards.

Core-Capability Profile ULMOD.COM:

1st Core-Capability: 10%(Regulatory)+ 20% (Positional) + 40% (Functional)+ 30% (Organisational)

2nd Core-Capability: 20%(Regulatory)+ 20% (Positional)+ 35% (Functional)+ 25% (Organisational)

Summarizing at this point, we see leveraging the core-capabilities as an appropriate method to sustain the firm’s competitive advantage. Core-capabilities in proper managed firms could be enhanced with each development project. But, for any effective development process, it is also necessary that the management recognizes the dysfunctional side of the organizational routines. Project managers should be explicitly aware of all kind of interactions of their projects with the respective core-capabilities. The same capabilities that had been supportive for former projects could be obstacles for the building of new ones. In general, the firms from our case-study firms were explicitly aware of their core-capabilities but did not give too much importance to their dysfunctional side.

[67] For example: Simultaneous transmission of television, radio, 10Mbit with one cable with plug and play compatibility.

10.2 Analysis of the Strategic Context established by the Case-Study Firms

As argumented above, for any successful capability development with the help of development projects, the corporate management should provide the strategic context that supports any kind of project work. Especially "incongruent" projects force the firm to learn, to "stretch" its targets and thus to develop its performance in the long run. **Burgelmann** (1983) following the ideas of **Mintzberg** and **Miles & Snow**[68] argues that for a continuous viable firm performance, the firms need at the same time "diversity" and "order". This argument serves us as metaphor for "incongruent" and "congruent" projects. To achieve this kind of diversity, the corporate management may support to a certain degree "entrepreneurial" activities within the organization. These activities may generate new resource combinations by extending the firm's activities into unknown areas, or areas marginally related to its current core-capabilities. In general, the corporate management has to determine the ratio of congruent/incongruent projects looking for an optimal influence of project outcomes on firm performance.

10.2.1 Consistent Entrepreneurial Factors for the Building of a Strategic Context for Incongruent Projects.

As we described in our research review, **Kuratko** *et al*.[69] provide a measurement system which the corporate management may use to assess the existing ***degree of intrapreneurship culture*** in the organization. The different dimensions/factors are statistically proven and relative "stable". A corporate management that plans to initialize any incongruent project within an intrapreneurial climate should assess the own firm's context with regard to these criteria. Considering these entrepreneurial factors, we will assess the existing degree of intrapreneurship in our case study firms:[70]

Intrapreneurial Factor (IF): The corporate management should make an appropriate use of rewards: It should create a reward system that sets the right goals (challenging but reachable), gives feedback to the project teams, and put emphasis on the individual team workers responsibility. The management should also make the rewards dependent from the performance of the team.

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[68] Mintzberg (1973) and Miles & Snow (1978) related the integration of "corporate entrepreneurship" and "strategic management" to typologies of organizations and of strategic processes. Form their empirical findings, the authors generalized four typologies of organizations that are characterized by different combinations of "autonomous" and "induced" strategic behavior.

[69] KURATKO, D. & MONTAGNO R.V.& HORNSBY J.S. (1990): "Developing an Intrapreneurial Assessment Instrument for an effective Corporate Entrepreneurial Environment", in Strategic Management Journal, Vol.11, pp.49-58.

[70] According to Kuratko *et al*.(1990), while the literature illustrates a wide variety of entrepreneurial factors, these elements are consistent in this field.

At CARMEDIA, team- and project work were seen as the general mode in which tasks should be fulfilled. For this reason, there were no special/additional benefits foreseen. The personal evaluation and the further career possibilities were strongly related to the project design and outcome. A positive evaluation should allow the team member to follow the project to the customer, being responsible for the further maintenance of the product.

At RECEIVE-TECHNOLOGIES, the reward system followed still the rules of the former functional structure and job-roles. This was due to German law, which protects the employee from volatile payments. Only the temporarily hired external workforce with fix-term contracts earned "over-average". The general motivation was increased by the so-called "milestone payments", paid by the customer. Here, the customer only provided the next payment, if a new "milestone" target had been reached. At RECEIVE-TECHNOLOGIES, the personal career is linked to the project to some extend. But in most cases the team members will return to their former roles after the project is completed and will not follow different career-paths.

At COMPUTEX, the variable part of the payments was more and more increased to reflect the increasing risk taking mentality. The corporate management explained that the idea behind that change was to foster self-responsibility and empowerment, but the employees could decide if they would increase their variable part or not. At ULMOD.COM, due to the subcontractor status, all compensations and eventually "extra-boni" were linked to the project outcomes. That way, the teams had a high pressure to perform well.

IF: There should be a demonstrated management support and explicit willingness to facilitate entrepreneurial / incongruent projects.

IF: There must be enough resources (including also time) for such enterprise. The employees must perceive the availability of resources for their intrapreneurial activities.

At CARMEDIA, our interview partner described the organizational context as very open and enabling entrepreneurial activities. It was seen as a "trusting" organizational culture with less bureaucracy using empowered teams with a high employee autonomy in decision making. All team members were allowed to follow their own project ideas if they seem interesting for a new development. For this aim, everybody in the team could use 10-20% of his contractual working time for his/her own projects. In general the working processes/tasks were result oriented that means that everybody may choose the way s/he wants to get those results and in general not being constraint from prescribed working time tables.

At RECEIVE-TECHNOLOGIES, the corporate management had already experience with launching intrapreneurial projects in the past. For this purpose, the firm had various budgets created. These budgets had been higher in the past, but they still allowed to finance different kinds of projects, also experimental ones. The team members have sufficient time for problem saving.

At COMPUTEX, the strategic context for self-empowerment was enhanced when a new corporate manager was employed. This CEO came from a firm with a highly supported intrapreneurial context. Consequently, one of the new management targets was to get the employees more involved into the business, fostering individual responsibility for the outcomes. The management supported also the building of task forces, inter-departmental discussions, and cross-departmental development teams.

At ULMOD.COM, the situation could be described as two-folded, on the one hand, the owner managers had high expectations and gave clear working prescriptions, on the other hand there were short decision ways, no hierarchies and a good team atmosphere in the core-teams. While the team atmosphere in the sub-contractor teams varied depending from the respective subcontractors working philosophy.

IF: The corporate management as well as the teams must have the motivation and willingness to take risks.

IF: The corporate management should be tolerant to failures, regarding them as learning experience and give a second or third chance to the project teams.

At CARMEDIA, the corporate management did not explicitly encourage for risk taking but accepted a certain kind of risk by providing a context for empowered working behavior, where some own decisions could end up in project delays. Here single team members or the whole project team could follow misleading trajectories, which could bring the whole project in danger. But nevertheless, the management accepted this risk relying on its teams.

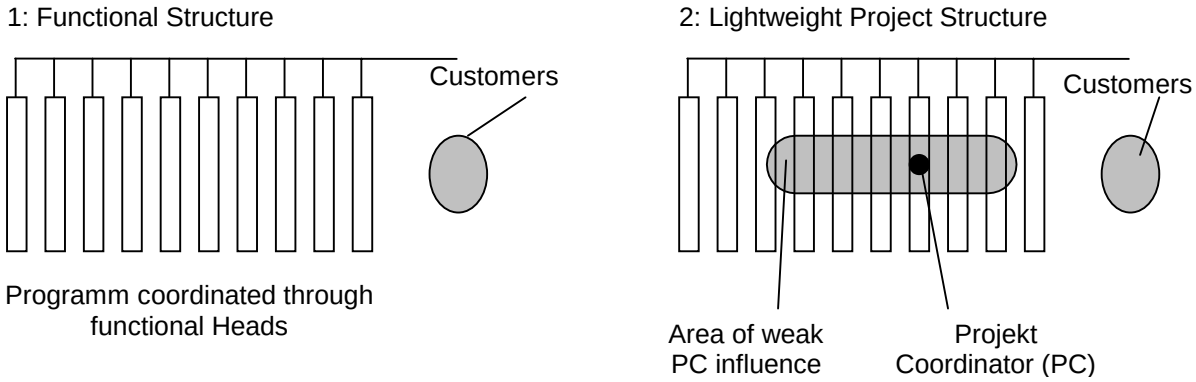
Looking at RECEIVE-TECHNOLOGIES history, risk taking was less accepted in the functional lines, but within intrapreneurship programs. But the programs had been decreased, as they could not be transformed efficiently into overall firm performance. Now, with the APA-I project and the planned organizational changes, the management increased the risk acceptance at team- and firm-level. At COMPUTEX, the corporate manager explicitly encouraged to take risks as this is seen as the way to success. In contrast , at ULMOD.COM the risk acceptance was very low. The corporate managers gave a second chance only, if the sub-contractors had been successful in the past.

10.2.2 Organizational Structures supporting Incongruent Development Projects

In the following we will set our focus on the organizational structures that had been created for project work in our case study firms. We will compare our findings referring to the approaches of **Miles&Snow**[71]**, Burgelmann,** and **Bowen** *et al*.. The latter authors describe a set of organizational structures that have proved to be appropriate for different kinds of development projects. These organizational structures vary in the degree to which they make use of "***specialization***", "***teamwork***", and "***integration with the customer***". Each of these models have their strengths and weaknesses. For any efficient project initiation, these strengths and weaknesses have to be matched with the requirements of the planned development project.

1) ***Functional*** Structure**:** Firms that have a functional structure are coordinated with the help of prescribed rules and procedures, shared routines among engineers, meetings and contacts. Here every functional managers is only responsible for his/her own functional line.

Figure 10.1: ***Project Structures 1-2***



In BOWEN, et al. (1994): "The Perpetual Enterprise Machine: Seven Keys to Corporal Renewal Through Successful Product and Process Development". Oxford University Press. Page 140.

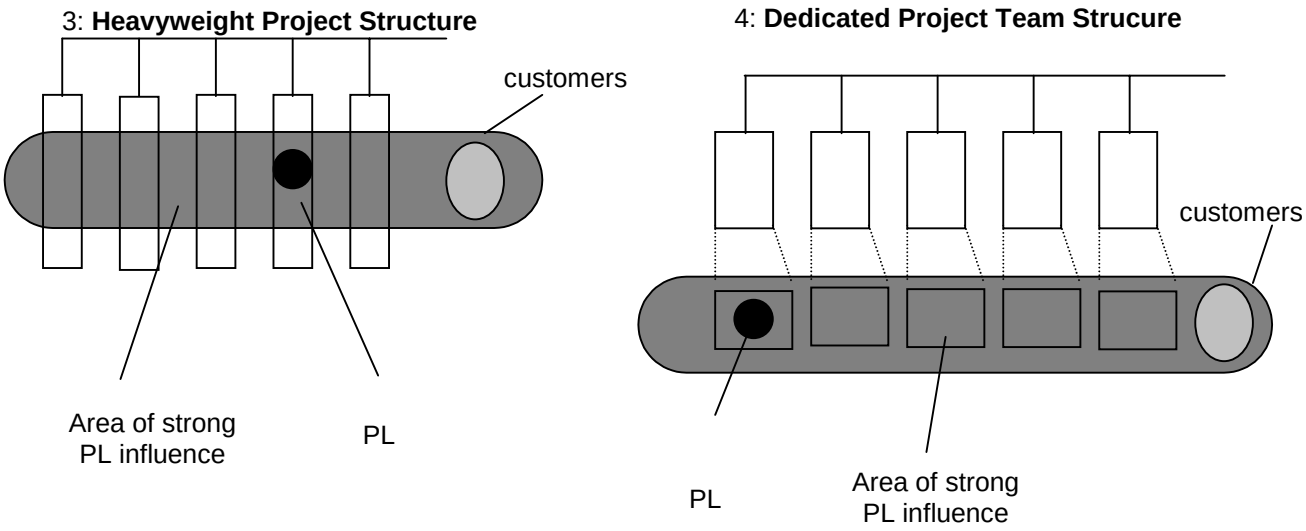
2) The so-called "***lightweight***" project structure relies also on functional lines, but here a supporting project coordinator (PC) tracks the project development with the help of pre-selected team members from every functional line. This project coordinator has no direct contact neither to the engineers, nor to the product designers/customers. S/he in general has no line authority like the functional manager and s/he is neither responsible for the concept, nor for the work done in the functions. The respective team representatives are responsible for the communication process back to

[71] Defender, Prospector, Reactor, Analyzer

their teams. This structure enables "smoother" communication and conflict solving processes. A "light-weight“ system is applicable where technical solutions are critical and customers‘ expectations are well defined and stable. But there should be ***no*** hard time pressure.

3) In contrast stands the "**heavyweigh**t" project structure. Here there is a project leader with broad responsibility and influence (normally with the same or a higher role than the functional managers). Team representatives serve as project leaders within their functional groups, but with a high authority status. The team and the project leader have direct access to everybody in- and outside the team. They are responsible for the ***internal coordination***, ***product and process planning, concept development*** and the ***integration of the customer*** into the process. This structure is particularly effective for large projects in highly competitive environments with time pressure.

Figure 10.2: ***Project Structures 3-4***



In BOWEN, et al. (1994): "The Perpetual Enterprise Machine: Seven Keys to Corporal Renewal Through Successful Product and Process Development". Oxford University Press. Page 140.

4) The strongest project orientation has the "**focused**" singular-purpose team. Here a project leader works with a team of people on a full time basis. The team members are also responsible for the functional work. They have left their functional groups and report directly to the project manager. The "**focused**" singular-purpose team would be effective under the same condition as the "heavyweight" system, but its special strength is ***leaving routines***, ***entering new markets***, or ***introducing a new technology***.[72] The context for such a structure is also described by **Veciana**.[73]

[72] But the management should not go so far to use the "dedicated team"-concept for all kind of development projects, because it is not automatically the most effective approach.
[73] VECIANA, J.M. (1996): "Generación y Desarrollo de Nuevos Proyectos Innovadores. "Venture Management" o "Corporate Entrepreneurship", in *Economia Industrial*, Nr.310.

If we now categorize our case study firms according to the typologies of **Miles** & **Snow** and **Bowen** *et al.***,** CARMEDIA could be defined as PROSPECTOR type. The firm is always looking for new opportunities and the commitment for "autonomous" strategic behavior is high. Therefore, a strategic context that enables autonomous thinking and acting is seen as being appropriate for the firm.

With regard to the project structure, it has characteristics of the "focused" singular-purpose team. As described before, the team members were remaining the whole time addicted to the project and were physically separated from the other workforce. They had personal freedom in decision making, especially with regard to their working hours and task fulfillment. Moreover they were empowered within certain limits with regard to their problem solving decisions. They had free time to follow their own ideas and their own solutions but these solutions should have the potential to be integrated into the overall project. The team members' direct link to the functional department was weak, and also the direct link to the market/customers. The responsibility for coordination and concept remained focused to the team. The project leader's influence was high on engineering and manufacturing, but not on marketing.

RECEIVE-TECHNOLOGIES former characteristics were mostly align with the DEFENDER type, but the management's long-term strategy was to change the organizational structure towards a form that resembles more the ANALYZER or the PROSPECTOR type. For this purpose, the firm changed its project work structure form a functional structure to a "focused" singular-purpose team. The team members' link to the functional departments was relatively weak (employees kept 10-20% of former job roles), but they had a direct link to the customer. The team members were fully co-located in a separate department, and the responsibility for project coordination and continuity remained in the team. The project leader's influence on engineering and manufacturing was strong.

With regard to the typology of **Miles & Snow**, COMPUTEX matches to a high degree the organizational characteristics of the PROSPECTOR type. At COMPUTEX, the MARGIN-20 project itself was structured in several autonomous project groups. The programming team was completely separated with own facilities, the controlling team shared the same building and was located in the middle of the different product units.

ULMOD.COM matches mainly the characteristic of the DEFENDER type. It is highly expert in the communication sector, but there are few projects with experimental characters. Due to the subcontractor concept, the management delegated all the team planning issues and responsibilities to the subcontractors and is only tracking and evaluating the project outcomes at the end.

10.2.3 Leadership Pattern: "Venture Manager" Attributes supporting Incongruent Projects

The more the project departs from the firm's core-capabilities, the more should the corporate management support all the upcoming intrapreneurial activities. As various authors argue, besides an appropriate strategic context, the success of the project realization depends to a great part from the personal traits, motivation and particular capabilities of the person that is engaged in the project (commonly defined as "venture manager"). A strong link could be found between project leadership and project performance in foregoing research.

As **Veciana** (1996) remarks, the investigation of **Hirsich** & **Peters** (1984) highlights that the outstanding factor of success for the development of new products had been the presence of an entrepreneurial profile of the "project leader". As **Veciana** further describes, **Schon** (1963) notes that for radical innovations, the venture manager has to possess prestige and power within the organization and a certain degree of "freedom of action" to carry out his/her assignments. Moreover s/he should be familiar with all the informal relations within the organization being able to localize early any "focus of resistance". For this job, the venture manager's interests and abilities should cover broad areas of technique, accounting costs, HR, etc.. Within our case studies, it was mentioned in the case of RECEIVE-TECHNOLOGIES that the successful project initiation was to a great extend depending on the personality of the project leaders. The project gained from the fact that the three project leader had been very experienced and had been highly motivated to initialize this new structured development process. **Veciana** (1973, 1996) highlights different characteristics/conditions that proved to be supportive for the implementation of a "venture team" or "new-venture group":

- The teams should be separated from the other employees of the organization (i.e. by providing an own working area). This stimulates the team building process, the team's creativity and the common sense of belonging of its members.

- The team members have to be selected form various fields of the organization with a certain dominance of the "technique area". The mutual interaction of a group of persons with distinct specialties is viewed as an essential motivator of creative outcomes. For that aim, the structure of the group has to be maintained very flexible.

- Every "new-venture group" needs to be supported by a so-called "sponsor" (in most cases the manager of the respective division) who helps the team following their new ideas and who facilitates their communication along the different hierarchical levels.

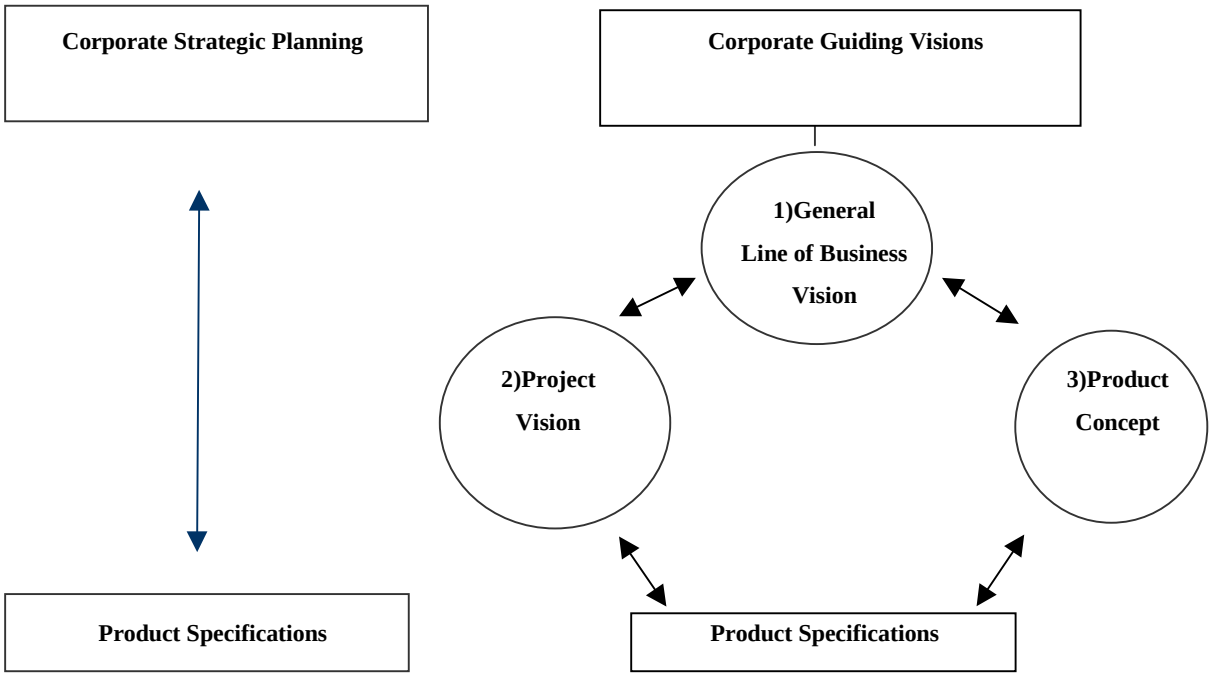
- The "venture team" should be guided by general formulated goals and motivated in the first line by "corps esprit". A too narrow fixed time schedule could have a negative influence.

10.3 Analysis of the Vision Creation Process: Creating Effective Visions to Link General Corporate Strategy with Detailed Project Team Decisions

A company's sustainable competitive advantage results from all contributions/decisions made at the various hierarchical levels of the firm. Every time a team member makes a decision, it may influence the whole project and it's contribution to the organizational capabilities. As **Bowen** *et al*. (1995: 59) note, corporate managers have to take care that all team members make "compatible" individual design decisions. Therefore, the development project should be guided by visions that are "translated" and operationalized to every subunit and accepted by all employees of the project team. The authors formulate a hierarchy of guiding visions (the general ***line-of-business vision,*** the ***project vision,*** and the detailed ***product concept)*** as a tool to lead the development team.

These visions should encompass a clear operationalized picture of the project's destination. They may guide the team members' "micro-decisions" during the project development process. As the authors describe, these guiding visions need not necessarily come from the corporate management. They could result from a "creative" person from any hierarchical level of the organization, but once introduced they have to be accepted by all members of the team (and its supportive environment).

Figure 10.3: **Effective *Visions linking general Corporate Strategy with Product Specifications***



In BOWEN, et al. (1994): "The Perpetual Enterprise Machine: Seven Keys to Corporal Renewal Through Successful Product and Process Development". Oxford University Press. Page 61.

The three visions may have crucial influence on the success or failure of any development project. The visions may link the general "corporate strategy" with the detailed "product design decisions" of the single employee:

1) The ***line-of-business*** vision links the general corporate strategy to the local development teams. Therefore, the key element of a line-of-business vision should be ***operations***-based, rather than oriented on finance[74]. An appropriate target could be the description of a future or external standard towards the development can go.

2) The ***project-level vision*** guides the operational work of the team by highlighting what capabilities need to be developed. It helps to integrate a product or process into the stream of other projects of the firm across functions. Even projects that seem to be incongruent with the core-capabilities could have a history within the firm that should be considered. Project-level visions must be formulized that way that team members of various sub-groups across the firm with various "professional languages" could understand and accept them.

3) The development team will use the ***product concept*** to clarify what the product is able to do. A product concept must encompass all the essential features of the users' needs for application. Moreover, a product concept must be visible to the development team. A complete product concept should be communicated regularly to the respective persons. If they do not understand the message, the concept looses all its value.

As **Bowen** *et al*. describe, often there exists a gap between the corporate strategic business planning process and the product design decisions being made several hierarchical levels below by a development team that is in charge of the product specifications. Therefore, the corporate management must routinely test the three visions to see if they still fit together. If the management don't react and reformulates the visions after a perceived crucial change, they will not communicate the right messages to the teams, and even be rigiditive to the new situation.

Within our case-study sample, we found that only COMPUTEX created a differentiated set of visions. In formulating its corporate vision, the firm goes align with it's American mother firm: ***"COMPUTEX will provide the highest value relationships to our customers, suppliers, employees and shareholders, globally"***. This vision was communicated throughout the company and could be found even on coffee cups and employees visiting cards. During our investigation there was a re-orientation and clearer definition of that corporate vision.

The formulation of the new vision was cited as: ***"COMPUTEX will deliver the highest value to our customers, suppliers, employees and shareholders as the premier technology marketing and service company, globally".*** According to a corporate manager statement, "the changes are more than semantics. Paramount to COMPUTEX success is our ability to "deliver"- not just to "provide" –value." This change was communicated and explained via email to the whole employee staff.

This new vision was then further operationalized. Like the corporate vision, it was addressed to each employee with the help of brochures and emails. The operationalized vision was formulated with regard to the following strategic key-issues:

- ***Higher customer focus***: Around 77% of the target headcount should deal with customer related issues.
- ***Higher supplier focus***: A new management team should develop and improve the relationship with the suppliers like Intel, AMD, etc.
- ***More empowered teams***
- ***More excellence in demand creation***: As the corporate management highlights, the COMPUTEX engineering team is one of it's core assets. Feedback from suppliers as well as from many customers indicates that the quality of this demand creation capability is rated very high. For this purpose, the responsible engineer team will be increased as soon as possible.
- ***More excellence in day-to-day operations***: There will be a focus on the development of the logistic sales support that goes hand-in-hand with the first point, the strong customer focus.

At CARMEDIA, a long-term vision was based on the firms key-attribute "innovativeness". The corporate management argued that their new DAB technology would not have a real breakthrough unless it would provide more features than the nowadays existing RDS technology. Therefore, the management enlarged its product strategy encompassing also multimedia and telecommunication features. Two years later, the firm could offer a broad product portfolio based on this technology.

RECEIVE-TECHNOLOGIES formulated its long-term vision with regard to two issues, the mass production of state-of-the-art electronic components and its internationality. The vision of ULMOD.COM encompassed "innovation" and "customer orientation", but was not as operationalized as in the case of COMPUTEX.

One major challenge in creating such proactive visions is to enhance the firms ability to access useful information. The outgoing basis for effective visions are various types of market- and technical information. In the first line, it depends on the ability of the managers/team members to access these

[74] Finance-based objectives are ineffective in terms of the guidance they provide to development teams, because

particular information. Often, the corporate management emphasizes particular sources according to their firm tradition. For example companies with strong marketing capabilities have a clearer product concept while companies that have their strengths in engineering processes have a clearer project vision. But in general, project managers do not have the full spectrum of sources from which they select their information. Often, important technical or market information remain unused in the firms' data base.

At the time of our research, we were told that CARMEDIA did not use any strategic instruments to investigate performance differences to its competitors. The firm used in the first line technology scenarios to visualize what should be technically possible in the near future. In contrast, RECEIVE-TECHNOLOGIES used assessment tools like "benchmarking" or "cost/benefit analysis" to determine the firm's "status quo". For mitigating the market risk, independent research institutes had been engaged to make a forecast of the applicability of the new technology.

Also COMPUTEX could be described as being advanced in using regularly assessment tools like benchmarking to compare the firm and its processes with its competitors. In the case of ULMOD.COM, regular visits of technology trade fairs and close relationships with universities provided new ideas and impetus for the further course of the firm.

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they do not provide guidelines how to carry out the product development.

10.4 Management Practice for Development Projects

According to **Bowen *et al***., the project management process is of double nature. There is on the one hand a need for integration activities ***within*** the project as well as the need for an alignment with the overall performance process to transform the project outcome. Integration within and across development teams enables the team members to learn from each other. The different functional departments like marketing, R&D, etc. can only take part in this integration process if their employees can make ***sense*** out of the information they receive from each other. Here we are in the same situation like if we want to create a common vision that every subunit could understand and accept.

The corporate management has to look for possibilities or tools that help to create these commonalties and common nouns. Using the same database and network system for research-, marketing-, manufacturing, and/or purchasing departments could be a first step. It also helps if representatives of the respective departments are visiting the customer site together to build common experience. Within an effective integration process, selected "experts" from each function may create opportunities at the ***interface point*** between the respective subunits. This leads to shortened development time, better quality of solutions and a broader scope of outcomes.

The quality of integration depends to a crucial part on the ***flow*** of the right information to the appropriate people. Team members should listen to each other and share their information. The development group should not only consist of experts of design and manufacturing, but also from sales, marketing, and customer service, etc.. The flow of communication follows the production value chain of the organization and must be translated from the one to the other group with common sense making. For example, if the marketing group receives some customer input, this input has to be translated into technical attributes for the engineering group. The information has to be translated in terms that every subsystem could understand.

Here the management has to cope with problematic situations that occur due to the specialization of the various departments involved. On the one hand, the specialization creates an efficient internal idiosyncratic language, but it hinders on the other hand people form outside that subgroup to take part in the communications. A team composed out of people from various subgroups with technical and non-technical background needs more time to find a common basis for communication.

The further step from ***coordination*** to ***integration*** depends to a larger part on the corporate management's commitment to create a strategic framework that enforces the building of the respective capabilities for integrational processes. As we described before, the management could "co-locate" the

team members from different functional groups into one shared department. Co-location itself is a prerequisite but it does not automatically lead to effective integration. It has to be complemented by other practices like:

- Cross-functional training, like rotating assignments/job enrichment programs that help the team members to understand the others needs.

- Learning from others, where each team member has to convert his/her own inputs in operating parameters for the whole project group at all levels.

- Prototyping and simulation, where problematic issues could be discussed in the fore-field.

- Formal management protocols that shift the focus/bias from technology development to the entire organizational development process.

We go align with **Bowen** *et al*., arguing that the coordination/integration processes must be carried out simultaneously at multiple levels, between project phases, business units, and external parties. Like for example in the CARMEDIA case, effective integration supports entire product families by providing a strong initial product platform, and enable the introduction of follow-up products without delay.

10.4.1 Management Practice of CARMEDIA

At CARMEDIA, on the average, every 1 ½ - 2 years a new project will be launched. In general, the impetus comes from an upper hierarchical level or the corporate management, but everybody else is invited to suggest new projects as well. For this purpose, the corporate management created a strategic context, where all issues around projects have a very high status.

The practiced knowledge protection led sometimes to a shortage in an appropriate workforce and makes it necessary to hire external specialist with fixed-term contracts. These specialists had to sign "disclosure agreements"[75] to mitigate the knowledge diffusion risk to other competitive firms. The management tried also to oblige them to stay in the firm for a longer period after the project was accomplished.

CARMEDIA formulated a process of how new project ideas have to be proceeded until they result in a real project.

[75] In these disclosure agreements, the respective person states that he/she will not provide this info to competitive firms.

This process encompasses different stages:

- Project proposal
- Project application
- Project introduction
- Project administration

With regard to the conceptualization of the projects, in general, the theoretical phase lasted 2-3 months, while all crucial strategic decisions were made during the first month. The average project time in total was calculated with two to five years. According to our interview partner, it is foreseen, that once a month, all employees from the department should come together to discuss the strategic course and to plan future steps in the respective projects. The single teams should met on a weekly basis (mostly Monday morning).

According to our interview partner, the reasons for the good success rate were:

- Good team communication
- The good know-how transfer within the team based on the communication
- Flat hierarchies

The development teams were using to a major extend simulation techniques and computer aided design programs if the project departed too much from the technical dimensions of the core-capabilities. In the BLUECHIP-9799 project, the major obstacle, the missing knowledge, was mitigated through the open minded working culture and the leeway for finding the best solutions. But nevertheless, the corporate management set a clear operational target, so everyone felt the challenge.

10.4.2 Management Practice of RECEIVE-TECHNOLOGIES

The corporate management of RECEIVE-TECHNOLOGIES created a strategic context with a lot of financial support for project work. The firm established an own internal "resource pool" for projects. As project management practice**,** RECEIVE-TECHNOLOGIES was using a time saving concept where the various project phases were starting in a parallel and overlapping mode. At the beginning, with the help of scenario building techniques (in which the end product should fit), the product designers defined the product attributes, even if they were not technological possible at the current state of applicable technology. As our interview partner described, any follow-up project phase will begin as soon as the most critical problems in the foregoing phase have been adequately solved. Due to the long development time, the project planners have to calculate with technologies that are still in experimental stage, but where the R&D department already announced the feasibility relying on the devel-

opment capability of their teams. At the time of the final project stage, this technology should be applicable.

RECEIVE-TECHNOLOGIES was planning to establish institutionalized processes that may support especially those project leaders who have not so much experience in conducting development projects. That way, the firm wanted to avoid ambiguous project outcomes.

Starting align with the project, there was the beginning of an institutionalization of a more effective product development process. According to the "5-Stage Model of Project Management" RECEIVE-TECHNOLOGIES has only reached the first stage. The first stage describes a scenario, where the project succeeds and falls with the respective project manager and his/her abilities to manage the project. The corporate management was engaged to reach the second stage with the help of the new project. Organizations that have already reached the second stage are able to reach a certain "reproductivity" of their projects.

RECEIVE-TECHNOLOGIES customer made strong prescriptions and set "challenges" for the firm to conduct the project according to his own quality standards. The project management had to present certain documents within certain time periods encompassing all new project phase descriptions and definitions. Monthly revenues were held to discuss these reports. That way, a certain process culture was obtrunized from the customer side. The project leader rated this "obtrusive" pressure as very supportive for the development of the process culture.

The firm formulated general principles of how to transfer the experimental technology into an applicable technology. These principles resulted in several project phases:

- ***Pre-definition*** phase: Determination of product features resulting from customer wishes,
- ***Definition*** phase: Determination of product specifications,
- ***Preliminary design*** phase: Determination of material and technical data of the product,
- ***Detailed design*** phase: Building of the first prototype,
- ***Engineering design*** model: Building the first prototype for serial production.

RECEIVE-TECHNOLOGIES plans with the help of those standardized processes to restructure the whole organization, not only one part of the business area. As the corporate management evaluated, the only way to survive in the new market segment would be to mix the new and old competencies and to find a niche again.

In spite of the complexity of the product and its specifications, the team remained relatively small and was composed out of 25 persons. They had been recruited from several departments and relocated in

an own department. During work-intensive phases, the team had been supported by an additional workforce hired with fix-term contracts. The team members had been engaged 90% of their time in project work, spending the remaining time for their former roles. Additional improvement of the operational performance was reached by outsourcing ineffective processes to subcontractors who had a better cost/price relation.

The management followed two major targets with the institutionalization of the development process. On the one hand the rate of "occasionally" inventions should be channeled. Such ambiguous inventions are difficult to consider within strategic long term planning (with regard to time horizon and resource allocation). On the other hand, considering the influence of experienced project leadership, the institutionalization should give less experienced project leaders support and increase the average level of successful projects.

The institutionalized development catalogue included the following issues:

- It was determined when certain documents had to be presented.
- The milestones and their achievements had been documented in a process report and a protocol was written.
- Whenever a new milestone has been achieved, it was officially signed by the project manager and a representative of the customer.
- A development handbook was certified.

RECEIVE-TECHNOLOGIES planned to restructure the whole organization with the help of those institutionalized processes. The corporate management continuously tracked the outcomes on the different stages, and that way received a continuous feedback about the overall development process.

10.4.3 Management Practice of COMPUTEX

At COMPUTEX, the strategic context for self-empowerment was enhanced when a new corporate manager was employed, stemming from a firm with a highly supported intrapreneurial context. Consequently, one of the new management targets was to get the employees more involved into the business, fostering individual responsibility for the outcomes. For this purpose, there were also changes made in the reward system to reflect the self-responsibility. The management supported also the building of task forces, inter-departmental discussions, and cross-departmental development teams.

The different phases of the development project were carried out in a "parallel" mode. It encompassed the following issues:

- Initiation of an international operating Margin Controlling Team.
- Centralization of the European Sales Controlling Team in the headquarter.
- Upgrading the SAP program with margin-control functions.

Those various targets had been accomplished by building different teams. Like the project management at RECEIVE-TECHNOLOGIES, COMPUTEX conducted the respective actions in an overlapping process that begun with the SAP development team starting to adapt the SAP software at the headquarter. The 30 IT programmer and consultants worked together in a separated department. This stage was followed by the relocation of the various controlling and marketing groups from the respective European sales departments to the headquarter. For this enterprise, all departments of the headquarter had been completely restructured. As the next step, the margin-controlling team was composed and organized from recently employed controllers.

For a smooth introduction, the entire working staff was "updated" with the new plans and trained as well. The complete workforce had been trained outside the normal working processes in an external training center. This practice had the advantage that the whole team was set free from their daily work- load, emails, and telephone calls etc. and could engage themselves much better on the training. One positive side-effect was the fact that people from all organizations and countries came to this training center and took part in these training seminars. Thus, it was a very good opportunity to improve or extend the personal networks. This personal contacts laid the fundament for a smooth collaboration and communication between the respective departments.

A similar circumstance improved the team spirit in the headquarter additionally. Due to the fact that the employees from the international departments had been relocated to Germany, they usually stayed at the beginning in the same hotel and shared also private activities. The one or other meeting was hold informally and also other information updates happened that way.

Because of the fact that the improvement of the project was measurable through statistical reports, the organization could more easier react and adapt the new processes. Especially, if it discovered that new discrepancies between the project and the overall organizational processes occurred. The improvements of the "margin target" have been controlled via the statistical reports. The corporate management checked those reports on a daily basis, because due to the project, there was a critical trade-off between the resale margin and the customer satisfaction.

Now, the customers did not get the products on time due to “margin blocked” deliveries. For this reason, after a two years period, the margin release authority was given back to the respective sales de-

partments. Too important was the just-in-time delivery service and the time lost due to discussions with the sales departments. The sales department had been given back the authority and self-responsibility to decide their own resale margin. But they also had to explain in detail, why they sold certain products at a certain margin, especially when it was lower than the prescribed average. Additionally, to mitigate antagonistic tendencies among the various departments, exchange programs and mutual visits were initiated where the employees visited the other departments for some days and experienced the others‘ problems and perspectives, gaining new understanding and commonalties.

To align the different interests of the various departments, COMPUTEX used a common remuneration system. For example the remuneration of the marketing department was adapted to be in line with that of the sales department. From now on, the variable bonus payment of sales and marketing was calculated in the same way. This should avoid antagonistic strategic decisions.

10.4.4 Management Practice of ULMOD.COM

Due to the fact that ULMOD.COM is a relative small company, but having its customers located across Germany (Bayern, Baden-Württemberg, Nord-Rhein-Westfalen), the firm outsourced its operational business to subcontractors being able to guarantee a continuous performance standard. Because of this practice, the management had to establish special relationships with these subcontractors. As our interview partner explained, the corporate management's view was that the most effective way to carry out such projects is to delegate operational issues, but to set fixed time schedules for their accomplishment. Going align with that practice, the failure tolerance has been set very low.

For maintaining this quality standard, the firm was providing the subcontractors with all necessary resources for conducting the projects. At the first project stage, the headquarter sent a technician from the core-team, who was involved in the planning from the very beginning. If all strategic points were cleared, the subcontrator took over with the own team. Due to the subcontractor status, all compensations were linked to the project outcomes. That way, the teams had a high pressure to perform well. In general, the subcontractors were only working for ULMOD.COM, but there was always the possibility that the firm selects a new subcontractor if their results depart too much from the prescriptions.

The quality standard is well recognized among ULMOD.COM's customers and the firm could establish long-lasting customer relationships. The firm demonstrated these relationships by highlighting the reference projects on the corporate internet page. That way, the firm could also win maintenance orders of already installed systems from its competitors. This maintenance service developed to a crucial source of income.

10.5 Analysis of the Transformation Processes from Project Outcomes to Organizational Capabilities

Being interested in the learning process of the organization as a whole, we conducted an analysis of those activities at "project level" that were transformed (or having the potential) to enhance the firm's competitive advantage/core-capabilities at "firm level".

As **Bowen** *et al*. (1995: 273) note, the corporate management has to consider two issues that facilitate the application of the results learned from one project to the follow up project:

1) The management has to be aware that every project affects the company in two directions, on the one hand to develop the product and on the other hand to support the learning process of the organization. Therefore, it should be aware that these are two separate strategic goals to follow.

2) The desire to be a learning organization must be supported by guiding visions. If the visions place a priority and expectation on learning, then people will adopt the needed "frame of mind" and start to transfer the new knowledge.

The learning process must be initiated on all levels throughout the company in a cross-functional way and with a long-term horizon. The corporate management should explicitly promote "learning from development projects". For this purpose, the corporate management itself has to learn of what is going on "in-depth" in the organizational processes. It should not only be interested in the short-term product results.

The trigger for learning must come from inside the organization. The team itself must believe that it can find a better way to work. As we described before, the team members must have ownership and commitment to be motivated for learning. Corporate managers can promote such commitment by establishing an atmosphere in which everyone is sensitive to the learning process of the organization. But normally, corporate managers have low priorities for learning and long-term expectations. As **Bowen** *et al.* describe, ***„there is always a market push that causes you to pursue the first goal of a project, namely the product or process. Management is not going to let the team get too far off course on that. But for the second goal, there is no market out there, no external force. That is what senior management has to provide“***.

Following a capability oriented strategy, the management has to be aware of this trade off that everything that is being invested in developing a long-term capability will take recources from todays re-

turns. In spite of the fact that it is very difficult to attach cash flows to capabilities, the corporate management need to establish an environment in which it is viewed as a normal process to save money for long-term investments for future capabilities.

10.5.1 The Learning Processes at CARMEDIA

At CARMEDIA, the first project BLUECHIP-9597 was a crucial contribution to the organizational learning processes. It contributed to the development of an institutional way of how to design and carry out project work (including: to make project proposals; to administrate a project; to apply for resources; to present a project). During the project, the team learned from scratch how to design a chip process. These new routines were the basis for many future projects and thus contributed crucially to sustain CARMEDIA's competitive advantage. Thus, it enabled the firm to be ahead of it's competitors.

The follow-up project BLUECHIP-9799 was still making positive contributions, but not as crucial as the first one. With the help of the follow-up project, the routinized design process of a chip could be further advanced and "fine tuned". Also the team culture could be further improved, but in CARMEDIA's case, both projects did not influence or change the organizational culture to a very great extend, because there was already a strategic context created which supported any kind of projects, also incongruent ones. Summarizing, we could say that the projects helped to enlarge he know-how and operational performance, but they did not change the team working culture, which had already been established before.

10.5.2 The Learning Processes at RECEIVE TECHNOLOGIES

The corporate management of RECEIVE-TECHNOLOGIES had the explicit plan to use the APA-I project as "change agent". The successful conduction of APA-I should provide an enormous competitive advantage in the current industry sector and should further prepare the firm with complementary knowledge and financial resources for new possibilities in other markets. With the help of the project, the firm engaged to change it's entire organizational working processes from functional departments to a "team work structure" with empowered teams. Currently, a lot of initiatives have been launched to support these changes.

As described in the case-study report, the complete development had to be aligned with the development standards of the customer. This customer already established an advanced operational process following the ISO norms and that way forced RECEIVE-TECHNOLOGIES to establish and achieve similar quality standards. In this case, the management used the influence and prescriptions of the

customer as impetus to change the complete development process and its operational working structures.

Before the initialization of the APA-I project, every project development was as good or as bad as the respective team leaders. As the project leader described, all of the knowledge was stored in their heads. The firm had some documented procedures, but those guidelines had not been operationalized. Within the "milestone" plan, it was determined when certain documents had to be presented. Continuous revenues held the customer up to date and a process report covered the achievements of the respective miles stones. Moreover, a protocol of the achievements was written. Whenever a new milestone had been achieved, it was officially signed by the project manager and a representative of the customer. During this phase, all project leaders have to assess the time and cost improvements. Finally, a development handbook was certified.

With the help of the project, the corporate management intended to introduce the following changes:

- There was a planned change to shift from a customer-focused cost-intensive product development strategy towards mass production.
- The whole organization structure is planned to be changed from a functional structure towards a team structure
- The whole development process will be institutionalized to avoid incalculable outcomes
- The focus on the core-capabilities should be improved.
- The outsourcing of processes of inefficient technologies to save costs.
- To speed up development time with the help of collaborative alliance partners from the new industry sectors.

The management followed two targets with the institutionalization of the development process. On the one hand the rate of "occasionally" inventions should be channeled. Such ambiguous inventions are difficult to consider within strategic long term planning (with regard to time horizon and resource allocation). On the other hand, considering the influence of experienced project leadership, the institutionalization should give less experienced project leaders support and increase the average level of successful projects.

The institutionalized development catalogue included the following issues:

- It was determined when certain documents had to be presented.
- The milestones and their achievements had been documented in a process report and a protocol was written.
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- A development handbook was certified.

With the help of those standardized processes RECEIVE-TECHNOLOGIES plans to restructure the whole organization.

As our interview partner explained, the project helped strongly to develop an institutionalized structure for the management of projects. The project outcomes are being continuously tracked and evaluated. The target would be a development and link of specialized experience with management capabilities for the respective team leaders. As described in the case, the team learned a lot from the management practice of its customers who has reached a higher stage of an institutionalized project development process.

Another RECEIVE-TECHNOLOGIES learning strategy is to gain complementary capabilities through alliance partnerships with firms operating in different industry sectors. That way the firm may establish a competitive mix of old and new capabilities.

10.5.3 The Learning Processes at COMPUTEX

One target of COMPUTEX management was to raise the overall process performance to those of the firms best performing units. The firm engaged a lot in project work and like in the case of RECEIVE-TECHNOLOGIES, the project was used to initiate crucial changes in the operational processes and working culture. The MARGIN-20 project was strongly intertwined with the firm's re-organization processes and caused crucial changes in the organization’s structure, and also changes in COMPUTEX organizational values like its "collaborative culture", "personal empowerment", and/or "entrepreneurial spirit".

During the project, employees from all over Europe had to reallocate themselves at the headquarter. For this enterprise, the management had to cope with several challenges. On the one hand, the "business" coordination of the several product-business-units in one department had to be organized, on the other hand the integration of the cross departmental operating Margin Control Group had to be planned. At the end of the project, the whole organization looked completely different. While the sales department decreased in number of employees, the headquarter increased its workforce and authority.

One of the major experience the corporate management made was the fact that taking away authority from employees or departments is a critical action that may cause serious troubles with regard to employee commitment and collaboration in the long run. On the first view, the project seemed to be suc-

cessful because the margin increased drastically, but in the long run, after a two years performance period, it was visible that the lost empowerment had a critical influence on the sales out, billings and personal motivation. After an employee survey about working issues like "working atmosphere", "collaboration" etc., it was indicated that the collaboration with the other departments seems to be a difficult act that hinders efficient work. This situation was caused mainly through the new project.[76]

10.5.4 The Learning Process at ULMOD.COM

At ULMOD.COM, there were continuous improvements and learning activities, resulting form every day working experiences of the project teams that went into the knowledge pool of the subcontractors or could be integrated into the knowledge base of the firm.

There were the "normal" operational activities at the project level that led to an incremental improvement of the firm's core-capabilities. A major step was made in the year 2000 when the firm made a reorganization and integrated another firm. We see it not in the first line as a change caused by the project but the project highlighted the need for a further performance improvement.

10.5.5 Prototypes and Testing Phases supporting the Learning Process

Prototypes and/or extensive early testing phases should be used to fasten the learning process and to reduce development uncertainties. From our case study sample, only CARMEDIA and RECEIVE-TECHNOLOGIES were using prototypes and simulation techniques within their development process.

At CARMEDIA, the first project was not supported by the technical dimension. For this reason, the first design approach was made on a virtual theoretical level with the help of computer aided design programs (CAD). The corporate management prescribed the wanted features of the chip to the development groups, but the way how to integrate all the functions into the chip was not determined and depended on the own planning effort and activities of the team.

As we described in the case, the general problem in designing a chip architecture is that there is no possibility to correct mistakes afterwards. That means that if the chip once is designed, there is no

[76] To mitigate this effect, there were exchange programs initiated where employees from each departments visited each other spending a day within that other department. This way, they experienced the others‘ problems and perspectives. Moreover, they could see, which computer programs and screens the others used, and for example how it looks like for sales, if an order is blocked.

way for further improvement or failure correction inside the chip. Therefore, a broad testing and theoretical simulation phase is crucial to prevent the chip from fail functions.

At RECEIVE-TECHNOLOGIES, the project duration was very long and with different development phases. Prototypes were introduced in the fourth phase, the socalled "Detailed Design Phase". In the fifth phase the "Engineering Design Model", the first prototypes already for serial production were produced.

As **Bowen** *et al*. (1995: 202) state, in general, firms neglect the usage of prototypes, or do not create the right representative prototypes early enough to mitigate the uncertainties during the development process. The prototype concept should not remain at the engineering / designer level, but should encompass a series starting from first computer simulations until nearly finished products. The prototype should be used as a communication tool to bring the development team, the corporate management and the customers together. According to the authors, the effectiveness of prototypes depends on three critical factors:

- The timing of prototypes throughout the development process
- The completeness of each prototype model/concept
- The representative quality of the prototype (is it made with the same materials, parts, and processes similar to the real production process?)

Each prototyping stage allows the management and the team to learn and in the same way reduces the development time by detecting problems in the fore field. Thus, it prevents cost intensive late design changes. As **Bowen** *et al*. (1995) highlight, the best products and the most efficient processes come in general from teams that effectively used a variety of prototypes.

In most cases, during the first 15% percent of time spent for a development process, about 85% of the ultimate costs of the project are already determined. Therefore, early prototyping could help making the right strategic decisions. It should be used as a routinized practice for all development programs. The team should not try to struggle for "perfect" early prototype, but it should continuously learn during that process. This also means that the corporate management has to invest more money at the beginning stages of the development project. In general, firms that make more changes in the "first one-third" of the development path make fewer "late" changes. Those "late" changes have a different character, they have more the character of ***refinement changes*** instead of ***crisis changes*** of those teams that are searching for nearly perfect prototypes and wait too long.

10.6 Different Types of Capability-Based Strategies used from our Case-Study Firms

As **Kaplan** *et al*. (2001: 86) note, the core of any business strategy is the "value proposition" delivered to the customer. According to the authors, around 75 percent of the corporate managers do not have a clear consensus of their customers' value proposition. The value proposition encompasses the firm's specific mix of product, price, service, relationship, image etc. provided to its "targeted" customers. Targeted customers are those who put the highest importance on this value propositions. Thus, the targeted customers should become the focus of the firm's strategic measures like: Customer satisfaction; Customer retention; Account share, Market share, etc.

According to our case study findings, RECEIVE-TECHNOLOGIES, COMPUTEX, and ULMOD.COM were well aware of their customers' needs. RECEIVE-TECHNOLOGIES had a strong customer relationship, where the customer supported (but also prescribed) strongly the product development process. The design and all the product features were determined and developed in accordance with the customer's feedback. Also COMPUTEX was aware of its customers' value propositions. In this case, the determination of the needs was more obvious. "Price" and "availability" of the products were the demanded key-criteria. In the case of ULMOD.COM, by providing superior service, the firm could win additional maintenance orders from customers who at first bought from its competitors. Only CARMEDIA's marketing department did not build the link between the customers' value propositions and the product features. The development was technology driven and the teams were relying on their technology scenarios.

According to **Kaplan** *et al.* (2001), a successful strategy guarantees alignment between an organization's ***internal activities*** and its ***customer value propositions***. These internal activities are taking place within the ***internal business processes*** ("innovation processes", "customer management processes", "operational processes"). The authors define the firm's value chain as a sequence of these internal business processes that start with the innovation processes, followed by customer management processes, etc.

Table 10.3: ***Activities within the Sequential Internal Business Processes following the Value Chain***

Process:	Activities:
Innovation Process	Invention, Product Development, Speed to Market, etc.
Customer Management Process	Customer Service, Solution Development, Relationship Management
Operational Process	Supply Chain Management, Operations Efficiency: Cost, Quality, Cycle Time Improvement, Capacity Management

All these processes (with their respective set of activities) must be performed well by every organization. But companies must excel at ***one*** process that has the maximum impact on its customers' value propositions and thus represents the firm's core-capabilities.

Treacy & Wiersema (1995**)** highlight three important strategies that a firm may use to differentiate itself from its competitors (in the eyes of its targeted customers):

- ***Product Leadership Strategy***
- ***Customer Intimacy Strategy***
- ***Operational Excellence Strategy***

Table 10.4 shows that different aspects of the value proposition become more crucial than others depending on the respective strategy. For example, companies following a ***product leadership strategy*** should select the first process of the value chain (innovation process) as core-capability, while maintaining basic capabilities for their customer management- and operational processes. These ***innovation processes*** are encompassing activities like "inventions", "product developments", and "speed to market".

Table 10.4: ***Identifying Strategic Internal Business Processes based on*** Kaplan **et *al*. (2001: 91)**

Process / **Strategy**	***Innovation Processes***	***Customer Management Processes***	***Operational Processes***
			Value Chain →
Product Leadership			
CARMEDIA	**Core-Capability** **-Invention** **-Product Development** **-Speed to Market**	Basic Process Capability	Basic Process Capability
Customer Intimacy			
RECEIVE-TECHNOLOGIES ***ULMOD.COM*** ***COMPUTEX***	Basic Process Capability	**Core-Capability** **-Solution Development** **-Customer Service** **-Relationship Management**	Basic ProcessCapability
Operational Excellence			**Core-Capability**
COMPUTEX	Basic Process Capability	Basic Process Capability	**-Supply Chain Management** **-Operations Efficiency:** Cost, Quality Cycle Time **-Capacity Management**

Following this typology, we could describe CARMEDIA as a firm that uses in the first line the product leadership strategy. CARMEDIA's products have superior functionality and performance of their products or services. During the firms history, the firm can provide a history successful product inventions where it has been the first who invent this product or product feature. Also RECEIVE-TECHNOLOGIES applies a combination of product leadership- and customer intimacy strategy. One of its major strengths is the state-of-art technology of its products.

COMPUTEX, RECEIVE-TECHNOLOGIES as well as ULMOD.COM are using also the ***customer intimacy strategy*** [77]**.** This strategy requires to understand in-depth the customers' needs for the building of long-term relationships. Companies following a customer intimacy strategy will stress the quality of their relationships with customers and the completeness of the solution offered to customers. A customer intimacy strategy requires excellent ***customer management processes*** such as relationship management and solution development. Here, the supporting innovation process would be motivated by the needs of targeted customers, focussing on those new product developments that contribute to better customer solutions. All three firms formulated at least one of their core-capabilities referring to customer solutions like maintenance or testing service.

COMPUTEX followed an operational excellence strategy: Companies who are planning an operational excellence strategy need to be best at measures of competitive price, customer perceived quality, lead time, and on-time delivery for purchasing etc. An operational excellence strategy emphasizes measures of the cost quality, and cycle time of **operating processes**, excellent supplier relationships, and speed and efficiency of supply and distribution processes.

10.6.1 Outsourcing Competencies and Capabilities

As a consequence of the firm's concentration on its core-capabilities, the corporate management has to decide if the remaining types of capabilities should still be processed within the organization, or if there are other more efficient ways. The corporate management has to develop on the one hand criteria for the selection of those capabilities that should be outsourced, and on the other hand criteria for the selection of appropriate outsourcing partners (Do they have the complementary capabilities?). Besides the core-capabilities, there are other capabilities which contribute critically to the firms competitive advantage. According to **Heikkilä & Cordon** (2002), the corporate management need carefully to consider both, the strategic and the operational issues when it makes its outsourcing decisions, always assessing the relationship between the outsourced activity and the rest of the organization.

The authors describe also some potential drawbacks to outsourcing initiatives:

- Outsourcing too many activities.
- By making the wrong definitions of the core-capabilities, confusing more than clarifying the outsourcing process. **"*Classifying an activity as "non-core" may lead to serious oversimplification of the complexity of the real business situation*"** (2002: 184).
- Transfer of know-how outside the firm that encourages new competitors.
- According to the authors, if the efficiency of the particular operation is high, it is advisable to keep the activity in-house, assuming that the company can maintain this efficiency well into the future.

Two of our case-study firms ULMOD.COM and RECEIVE-TECHNOLOGIES applied this outsourcing strategy. But, the firms did not base their outsourcing decisions on the distinction between "core-capabilities" versus "non core-capabilities". As we already described, ULMOD.COM outsourced its complete operational business to various subcontractors located in different German regions. That way, it outsourced to a main extend its organizational core processes. As a consequence, all new knowledge and experience from the projects will at first remain with these subcontractors and has to be transmitted to the core-team later on. Thus, on the one hand, not all important knowledge will be transmitted, and on the other hand the dependency from the subcontractor increases, because with more and more knowledge the subcontractor may be able to become a future competitor.

RECEIVE-TECHNOLOGIES plans to outsource for cost efficiency reasons some technology for mass production. Also in this case, the management is going to outsource parts of its key processes, and as a consequence the firm will loose its technology leadership in this area. To prevent this loss in competencies and capabilities, the firm is looking more for relationships with appropriate alliance partners. COMPUTEX goes the other way around and follows an acquisition strategy to increase its value chain. By integrating other firms it could increase crucially its product and service portfolio.

[77] O'DELL, C. & GRAYSON, C. (1999): "Knowledge Transfer: Discover Your Value Proposition", in *Strategy and Leadership* (March-April1999; pp.10-15).

CHAPTER 11: CONCLUSIONS AND OUTLOOK

11.1 Retrospective View and Main Conclusions

Following our research objectives, we put a major focus on the analysis of the firms' development projects, viewing these projects as a magnifying glass for the whole firm performance, as usually repre-sentative team members from various departments of the firm are involved in the project realization process. Our intention was to describe how companies in ambiguous fast changing industries manage this development process, which strategies they use, and which procedures and practice.

We focused on the roles of the participating teams and individuals, going align with **Helfat** & **Peteraf (**2003), who point out that improvements in the performance of a capability are stemming from a complex set of factors, including learning-by-doing of individual team members and the team as a whole. We were further interested in the characteristics that make a development project successful beyond the targeted outcome of a new process or product. Here the (positive) influence of a "successful" project should be visible in the long run.

With the help of our case-study sample we intended to describe how the corporate management applies capability-based strategies in ambiguous fast changing industry sectors aligning the entire organization to support this aim. For this purpose, we analyzed the firms' consensus building activities deciding on which of their organizations' capabilities the focus for development should be set. We further investi-gated how the organizations, after having built consensus, were establishing communication processes across all hierarchical levels explaining the firms' strengths and strategies to all employees.

We approached the topic using a qualitative case-study methodology. We made qualitative cross-case comparisons describing similarities and idiosyncrasies of the respective development processes. As the core-capabilities are being built through a complex interacting process, we categorized the research topic in several "subgroups". This helped us to build a better structure of the research by formulating and separating the questions around the respective issues. These subgroups were:

- the development path of the firm,
- the core-capabilities,
- the development projects,
- the "interrelationships" of capabilities and projects, and
- the organizational and/or structural changes going align with the project.

They altogether may contribute and have to be considered, if we want to describe the focused organizational phenomena.

We further questioned, how the mutual influence of project and core-capabilities was managed. Could the management of our sample firms provoke a "win-win" situation? Did both the project and the core-capabilities support each other, or was one mainly hindered by the other?

We draw the following conclusions from our findings:

1) The analysis of the firm's different types of capabilities and the assessment of the value they currently (and in future) bring for the firm's customers are the most critical steps in a capability-based strategy.

The decision to develop a capability is a long lasting enterprise involving many efforts and resources. In general, the results of this development process can be noticed only in the long run. Therefore, it is crucial to determine and to develop the right capabilities from the beginning. In contrast to strategic changes in the product portfolio, plans to develop another capability are more difficult to accomplish. After the criteria and actions for the development of the respective capabilities are formulated, it is very challenging to convince all employees to re-orient themselves now to improve another capability.

As a first analytical step, the firm has to build consensus on the attributes of its products/services which have most value for its customers. This should be followed by a further determination of the basic-, support- and core-capabilities that contribute to this value. The resources that enable these capabilities should be identified and targets for their development formulated. The management must consider the selected core-capabilities in terms of their potential for a continuous contribution to the firms competitive advantage. Core-capabilities in proper managed firms could be enhanced with internal developments or with liaisons with external partners.

For any effective development process, it is also necessary that the corporate management recognizes the dysfunctional side of the organizational routines. Project managers should be explicitly aware of the interactions of their projects with the respective core-capabilities. The same capabilities that had been supportive for former projects could be obstacles for the building of new ones.

2) For the development of a core-capability, the management should know about the status quo of the respective capability. That means to know on which stage of the capability life-cycle the capability currently is.

After the consensus on the firm's core-capabilities has been built, it is an also (perhaps an even more) challenging enterprise to define the current development status of the involved capabilities. Depending from the current life-cycle status of the focused capability, the management should act differently. The respective stages like "growth", "maturity", and "decline", need different development activities. For example, in the "growth" stage where the capability has just been initiated, the focus should be set to organize the teams using idiosyncratic human capital and to formulize targets for the further capability building, while in the "maturity" phase, the management may deliberate to redeploy its core-capabilities in other markets or recombining them with outputs of development projects to improve their level of performance.

3) To use the core-capability approach as effective strategy, the whole organization has to be aligned, otherwise the strategy will "stuck in the middle" of the hierarchical levels.

As a capability-based strategy is not so obvious to follow, it depends on a clear communication through all hierarchies whether the strategy will be accepted and supported or not. Not only the corporate management, but everybody should be aware of how to contribute with ones own actions to the short-and long-term plans of the company. For this purpose, the corporate management has to create awareness throughout the company. As we found in our case studies, a high level of awareness goes align with a high percentage of successful projects. This awareness can be created with the help of various communication channels (i.e. emails, group meetings) and should reach all levels. Explicit awareness of core capabilities (as well as of core-rigidities) through all hierarchies is imperative to support project work and to transform the project outcome.

4) Projects that depart from the core-business are challenging the organization deeply, but if they are properly managed, they may contribute crucially to the development of the core-processes in the long run.

The status and acceptance of a new initiated project depends on the current situation of the firm. Was the project planned out of a need and therefore is its success so to speak "prescribed", because it is crucial for the further existence of the firm, or does the firm have enough free resources and the philosophy to provide their employees with some leeway for experimental projects? In case of projects that depart from the traditional strengths of the firm, it supports the initiation process if the management has already the positive experience that there were resulting opportunities from such kind of projects in the past.

If the project differs from the daily routines it needs a special context with extra resources and support and a special focus on the learning and transformation issues. Besides the structural "hard facts", there

are also other contextual factors like the "pattern of leadership" that are crucial for any project success. The corporate management should enable to a certain extend intrapreneurial activities. It needs to create an environment where the job of the project leader is one that it is worth to apply for. Often, the so-called "clinical factors"[78] discourage people to get in charge of major roles. Additionally, an adapted reward system should attract people to sign in for the project. Participating in a new development process should be viewed as an exciting and honored dedication.

It makes a a difference, whether a firm provides additional resources for experimental projects, or whether it plans to use the project as change agent. The initiation of the latter has to be prepared more carefully, because it will be the focal point of tension in the organization. Here the firms future competitive advantage is depending on that change, and therefore all negative influences resulting form the core-capabilities should be estimated and prevented already in the forefield.

Proposed projects that seem to be at the wrong place on the first view should nevertheless be checked for their long-term potential and the qualitative changes they bring, before dismissing the proposal.

In general, the management should consider which kind of project the firm is going to initiate and which criteria (qualitative/quantitative measurements) are seen as important to make it successful. For example, while the organizational tactic to isolate project teams is effective in the case of incongruent projects that may be hindered by the core-capabilities, it may slow down the development process of a congruent project, because the team would have more support from the remaining organization and additionally would not need to re-integrate the project outcomes after the accomplishment of the project. Therefore, the management should plan ex ante, whether it wants to initialize a "smooth" project or to use it as change agent challenging the firm's capabilities deeply and potentially renewing the status quo of the overall firm performance.

5) Firms that do not have the possibility to initiate ingruents projects can liaise with alliance partners to obtain a related effect.

In some cases the organization is either to small to reserve some additional resources and organizational staff for experimental projects, or the management hesitates to initiate such projects, because it questions its usefulness. Probably there were some negative outcomes in the past or the management has just not the possibility to create an appropriate context with the right work force to launch these projects.

[78] The socalled clinical factors (like i.e. 35 hour work, secure working environment) do not especially motivate,

Such organizations may use other "approaches" to enrich their own capability portfolio. They may apply collaborative strategies starting from building formal/informal alliances up to merging or acquisition strategies with firms possessing complementary capabilities. In any case there should a self-analysis as a first step to be aware of the own core-capability profile, outgoing from this analysis the firm may decide if it wants to undergo relationships with companies with the same or complementary capability profile.

6) Only a set of differentiated visions may lead to an alignment and integration of the development projects with the various operational processes within the different levels of the organization. For this purpose, the vision creation process should be improved and differentiated to address and reach different kinds of employees.

Capability-based strategies, dealing with complex processes, are not so obvious to define and to follow than guidelines based on structural perspectives referring to markets and industries. Markets and industries can be clearer defined and selected for entry decisions. For the application of resource-and capability-based strategies, the development project should be guided by different complementing visions that are "translated" and operationalized to every subunit and accepted by all employees and the project team. For a smooth integration of those complex processes the firm needs to create different types of visions with different contents that link the different hierarchical levels together.

The content of the visions should be adapted to the respective levels. For example, different sequential projects may be linked with the overall business line. Visions may help to integrate the single projects into the stream of businesses and also single products can be linked with the overall course of the firm. The different visions should refer to the short-term/long-term plans of the organization. For this purpose, they have to be differentiated between the general business vision on a higher hierarchical level that determine the long-term course and development of the firm and the more operationalized project or product vision that could guide the daily decisions on the group or team level. Prognosis /measurement tools like "bench-marking", "target-costing", "cost-benefit" analysis may support this vision creation process.

7) Pathdependency is a critical issue for project development, even when the team is locally (or legally) separated (i.e. as spin-off).

The historical development path of the firm has a major influence on the development project. It depends on the status and strategy behind the project (i.e. using it as a change agent), if this influence

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because they are presupposed, but the employee will hardly choose a working climate where they dont exists.

has to be seen in a positive or negative way. In general, the project proposals will be consciously or unconsciously formulated with regard to the incumbent processes and routines of the firm. Even in cases where large development project are conducted in ownstanding departments or "spin-off" companies, there will be still some influence from the mother firm and its core-capabilities. But this situation has not to be seen as being always negative for the project. Besides the financial sponsoring, the parenting firm may support the development project with proofed development concepts and vision formulation and may give some guidelines for the consensus building on the new capabilities.

The historical development path should be considered, on the one hand for the project planning itself, and on the other hand for the transformation process of the project outcomes. It will depend to a great extent from the former organizational structure and culture in which way the project outcome will be "assimilated".

8) The firm's competitive advantage may be sustained by transforming service capabilities to core-capabilities.

Two of our case-study firms RECEIVE-TECHNOLOGIES [testing service], and ULMOD.COM [maintenance service], created some of their core-capabilities out of service capabilities. By fulfilling several norms and certifications, RECEIVE-TECHNOLOGIES developed its testing capabilities to a highly valuable service, while ULMOD.COM enhanced its maintenance service providing functional updates on the existing technological infrastructure which is attracting even the customers of its competitors.

In some cases, a firm may create out of a support service (i.e maintenance service) a core business if it provides higher qualities and service levels than other firms in this sector and this will be noted by the customers who in the first line were interested in the "core" product. In some cases, the firm creates out of a support service a core-business that has the potential to sustain the competitive advantage even if the original core-capabilities decline or were imitated by competition. Therefore, if the management plans to outsource some parts of the firm's business processes, it should on the one hand consider which parts of the companies processes are supporting the current core-capabilities.

On the other hand it should asses all types of basic-, or supporting capabilities on their potential to contribute to the firm's competitive advantage in the long run. It is a critical task to decide which part of the value chain should be outsourced and consequently risking to loose important parts of strategically important capabilities.

9) The empowerment situation should be balanced between the team and the supporting departments.

In general, new projects (especially incongruent ones) may suffer from support and recognition from the surrounding departments at the very beginning project stage. There could be an underestimation of the projects potential, leading to a low hierarchical status. But also the other extreme situation may happen, where the project receives the main attention from the corporate management, while the other departments were neglected. This could be dysfunctional as well for the overall performance as the supporting groups feel suddenly being "abandoned". In general, not all employees can take part in an attractive project. But the project's success still depends to a certain extent on their support. The management cant make too much use of the project, if the relations to the former colleagues suffer from unbalanced empowerment.

Therefore, for any re-organization of working structures the individual team members and their supporting staff should obtain an appropriate balanced status, depending from the strategic intention of the project. It increases the team members motivation if the status is not lower than it was before in the former departments. For the "subjective" security of the single team members, the management should also provide propositions/"return tickets" that enable the employees to reorient themselves after the project, going back to their departments or following the project to the customers as in the case of CARMEDIA.

10) Determining criteria for success: The traditional performance measurement can lead to misleading evaluations of project outcomes and should be complemented with long-term targets and qualitative factors.

In many cases, the performance improvements and positive structural changes can only be noted after a longer period of time. Changing the organizational processes is a challenging and long-lasting enterprise encompassing changes of skills and applications and also the renewal of habits and believes. Any change of the employees' values and sense making is especially difficult to achieve and to measure. Therefore, even a project which seems to be a loss in the short run may reveal a major input for an organizational renewal in the long run.

Using only "traditional" performance measurements like "cash flow", "return on investments", etc., may underestimate the potential value of project outputs or structural changes after the project has been accomplished. Especially in case of incongruent projects, the "results" should not be assessed in financial terms but more with qualitative long-term measures. Different complementing criteria for

success should be formulated based on short- and long term as well as on quantitative and qualitative measurements.

Summarizing we propose that our findings may be linked with related approaches to build or complement a frame of reference for the management of dynamic core-capabilities. Here we refer especially to **Bowen** *et al.*, who provide advanced guidelines for the enhancement of firm performance with the help of development projects. We already introduced some of their arguments in the last chapter. For the implication of core-capabilities as strategy and the alignment of the firm as capability-focused organization, we propose to orient on the framework of the so-called "balanced scorecard", developed from **Kaplan** *et al*. (1995, 2001). Their model is based on the Total Quality Management approach (TQM) that takes the form of a scorecard. The scorecard is "balanced", because it considers short- and long-term perspectives as well as objective and subjective measurements.

11.2 Shortcomings of the Research

During our research we faced two major difficulties in getting the appropriate data. On the one hand, we had problems to define the categories that include completely our research focus. As a core-capability encompasses all dimensions like technology, skills, management, corporate values, etc., it is difficult to grasp such a complex issue completely. There is always a chance to miss a category which could contribute crucially to the understanding of the focused phenomena. We supposed that we could cover all relevant issues related to our research purpose, but due to the complexity, there is always the potential to choose the wrong selection criteria and to draw conclusions based on insufficient information. Another critical issue was the access to the data/information of our selected categories. As the corporate strategy in itself is a protected topic, some of our interview partners hesitated to provide information on these issues. We had to reduce our case-study sample to four cases, because we did not get sufficient information to cover our research categories from the originally selected sample.

Besides these "structural" shortcomings, we encountered also more general problems that occur by doing qualitative research, like the various biases of the respondents to the interview questions (i.e. the tendency to "neutral" and "middle response categories"). There was also a small tendency to agree that the project was an improvement, as a negative statement would allow to draw further conclusions or criticisms on the respondents' managers/corporate management. In a retrospective view, we could also view our expectations as an interviewer effect. As we were looking for successful projects and positive developments, there was a possibility to overweight the question catalogue regarding the positive outcomes and to put less attention to the negative ones.

11.3 Outlook

We were engaged to highlight within this work that the research focus on core-capabilties encompasses a great amount of interplaying variables and dimensions. For future research, the mutual influences and relationships of resources, core-capabilities, intrapreneurial projects, and overall organizational performance are offering a broad area for further case-studies.

Our first suggestion for complementary case-study research would be a further in-depth analysis of the consensus building process, using a participating- and/or observatory approach that starts the analysis from the corporate management level. As we described earlier, especially in the high-tech sector, the competition is quite high as the products/services differ only slightly. Here the corporate management is faced with the situation to define a strategical difference between the firm and its competitors, while this difference (or distinct value of its core-capabilities) is less obvious to discover and to describe than in other industry sectors. During the time of our empirical study, we could not participate in an ongoing corporate management consensus discussion. The consensus building activities of all of our case-study firms had already been accomplished before we started our field research. Therefore, further investigation should follow and describe this consensus building process as it is taking place, highlighting which motivation and positions the group members from different departments have. It will be of interest, how the discussion group has finally found its consensus that cristalized in the determination of the organizational core-capabilities.

As we described earlier, we conducted our case-studies mainly in middle- and/or large-sized companies (with the exception of ULMOD.COM). This was on the one hand due to the circumstances that we found in these firms an appropriate situation (i.e. incongrunet project work) that enabled us to gather appropriate data for our research. Nevertheless we argue that especially the research on this topic done in small firms can provide valuable insight into the organizational phenomena described above. It would be interesting to follow these consensus discussions within smaller firms to analyze whether they happen here differently and whether the participants have to cope with other obstacles to determine their core-capabilities. (I.e. which role plays the owner-manager during the consensus building process).

We argue that in general, the initiation of an incongruent project has a different impact on small firms than on larger organizations, as for example the resources "time and money" are more relevant in relation to the total budget of the respective firm. While middle-sized and/or large firms have often a special budget for project work, a smaller enterprise must in general spare these expenses from its everyday business. That way such incongruent projects are becoming to a greater extend a focal point

of tension than within a medium- or large-sized firm. We argue that also the success/failure of these projects is closer linked to the overall survival of the firm.

We propose for further research to start with a questionnaire survey that should be sent for a preliminary selection to the owner-managers of small firms operating in the high-tech sector. If the survey responses highligt an appropriate firm (that initiated incongruent projects), the research should be continued with interviews, and/or participating observation. As we had some difficulties to access the research object, we recommend to built a trustful relationship in the forefield which could end up in the building of a research- and/or consulting goup, composed out of university members and employees of the investigated firms. In an optimale case, the firm will be proactively motivated to participate, because the corporate management wants to apply a core-capability-based strategy.

As our intention was to use the empirical findings for the building or complementation of a frame of reference for corporate managers, we were focusing mainly on successful projects engaged to derive our guidelines from their efficient management practice. To "enlarge" this perspective, we suggest to conduct complementary case-studies that focus on the dysfunctional side of the core-capabilities by analyzing in the first line unsuccessful projects. It will be of interest which dimension of the core-capabilities stopped finally the project, and at which development stage it was terminated? Furthermore, was there any influence or intervention from the stakeholders/customers that prevented its accomplishment?

Within our case-study report, we treated the issue of "outsourcing" internal processes (of the value chain) to external partners only shortly, but it is of crucial strategical importance, especially for firms that want to apply a resource- and capability-based approach. As we described at point 10.6.1 the corporate management who follows an outsourcing strategy has to decide which part or dimension of the organizational capabilities should be outsourced (to which outsourcing partner?) and which part has to be be kept within the organization? Here competence can be lost, because of wrong strategic decisions that are for example due to misleading definitions of the core-capability.

Further studies may focus on the relation between outsourcing decisions and core-capability development. They should highlight if firms destroyed their core-capabilities by making inappropriate outsourcing decisions that result in the loss of their competitive advantage.

CHAPTER 12: APPENDIX

12.1 Bibliography

ADNER, R. & HELFAT, C (2003): "Corporate Effects and Dynamic Managerial Capabilities", in *Strategic Management Journal*, Vol.24, pp.1011-1025.

ADLER, P. S. & SHENBAR, A. (1990): "Adapting Your Technological Base: The Organizational Challenge", in *Sloan Management Review*, Fall, pp.25-37.

ANSOFF, H. (1965): "Corporate Strategy". McGraw-Hill, New York.

ARBEITSGRUPPE BIELEFELDER SOZIOLOGEN (1976): "Kommunikative Sozialforschung". München.

ATTESLANDER, P. (1992): "Methoden der Empirischen Sozialforschung". Berlin, New York.

ATTESLANDER, P. (1994): "Befragung und Beobachtung". Working Paper, Lehrstuhl für Soziologie und Empirische Sozialforschung, Universität of Augsburg.

BAIN, J.S. (1959): "Industrial Organization". Wiley, New York.

BARNEY, J.B. (1986): "Organisational Culture: Can It Be a Source of Sustained Competitive Advantage?", in *Academy of Management Review*, Vol.11, No.3, pp.656-665.

BARNEY, J.B. (1986): "Strategic Factor Markets: Expectations, Luck, and Business Strategy", in *Management Science*, Vol.32, No.10, pp.1231-1241.

BARNEY, J.B. (1995): "Looking Inside for Competitive Advantage", in *Academy of Management Executive*, Vol.9, No.4, pp.49-61.

BARNEY, J.B. (2001): "Is the Resource-Based 'View' a Useful Perspective for Strategic Management Research? Yes", in *Academy of Management Review*, Vol. 26, No.1, pp.41-56.

BARNEY, J.B. & ZAJAC, E. (1994): "Competitive Organizational Behavior: Toward an Organizationally-Based Theory of Competitive Advantage", in *Strategic Management Journal*, Vol.15, pp.5-9.

BARRETT, F.(1995): "Creating Appreciative Learning Cultures", in *Organizational Dynamics*, Autumn, pp.36-49.

BECKER, B. & HUSELID, M. & ULRICH D. (2001): "The HR Scorecard: Linking People, Strategy, and Performance". Harvard Business School Press, Boston, Massachusetts.

BECKER, H.S. & GEER, B. (1969): "Participant Observation and Interviewing", in McCALL & SIMMONS (eds): "Issues in Participant Observation". Reading, Mass.

BERG, B.L. (1989): "Qualitative Research Methods for the Social Sciences", in ALLYN & BACON, Needham Heights, MA.

BONNER, J. & RUEKERT, R. & WALKER, O. (2002): "Upper Management Control of New Product Development Projects and Project Performance", in *The Journal of Product Innovation Management*, Vol.19, pp.233-245.

BOWEN, K. & CLARK, K. & HOLLOWAY, C. & WHEELWRIGHT, S. (1994): "The Perpetual Enterprise Machine: Seven Keys to Corporal Renewal Through Successful Product and Process Development". Oxford University Press.

BURAWOY, M. (1991): "Ethnography Unbound". University of Califormia Press, Berkeley, CA.

BURGELMANN, R.A. (1983): "Corporate Entrepreneurship and Strategic Management: Insights from a Process Study", in *Management Science*, Vol.29, Nr.12, pp.1349-1364.

BURGELMANN, R.A. (1991): "Intraorganizational Ecology of Strategy Making and Organizational Adaption: Theory and Field Research", in *Organization Science*, Vol.2, No.3, August.

BURGELMANN, R.A. & SAYLES, L. (1987): "Les Intrapreneurs: Stratégie, Structure et Gestion de l'Innovation dans l'Enterprise". MacGraw-Hill, Paris.

CAMPBELL, D.T. (1975): "Degress of Freedom and the Case Study", in *Comparative Political Studies*, Vol. 8, July, pp.178-193.

CANNELL, C.F. & KAHN, R.L. (1953): "The Collection of Data by Interviewing", in FESTINGER, pp. 327-380.

CANNELL, C.F. & KAHN, R.L. (1968): "Interviewing", in GARDNER, L. & ARONSON (1968) (ed.), Handbook of Social Psychology, Vol.2, Massachussets, pp. 526-595.

CAPELLI, P. & CROCKER-HEFTER (1996): "Distinctive Human Resources Are Firms' Core Competencies", in *Organizational Dynamics*, Winter, pp.2-21.

CARR, L.G. (1971): "The Srole Items and Acquiescence", in *American Sociological Review*, Vol.36, pp.287-293.

CARRIER, C. (1991): "Inrapreneurship et PME", in *Gestion, Revue Internationale de Gestion*, Vol.16, No.4, November, pp.20-27.

CASSEL, C. & SYMON, G. (1994): "Qualitative Methods in Organisational Research: A Practical Guide, London, Sage.

CHAMPEL, D.T. et.al. (1975): "Nichtreaktive Meßverfahren". Weinheim, Basel.

CHANDLER, A.D. (1962): "Strategy and Structure". The MIT Press, Cambridge, MA.

CHANDLER, A.D. (1977): "The Visible Hand: The Managerial Revolution in American Business". Havard University Press, Cambridge, MA.

CHI, T. (1994): "Trading in Strategic Resources: Necessary Conditions, Transaction Cost Problems, and Choice of Exchange Structure", in *Strategic Management Journal*, Vol.15, pp.271-290.

CHRISMAN, J.C. (1994): "Writing Cases for Entrepreneurship Theory and Practice", in *Entrepreneurship Theory and Practice*, Winter.

CICOUREL, A. (1964): "Method and Measurement in Sociology". New York, London.

CICOUREL, A. (1970): "Methode und Messung in der Soziologie". Suhrkamp Verlag, Frankfurt.

CLARK, K. & FUJIMOTO, (1991): "Product Development Performance: Strategy, Organization and Management in the World Auto Industries." Harvard Business School Press, Cambridge, MA.

COASE, R. (1937): "The Nature of the Firm", in *Economica*, Vol. 4, pp.386-405.

COFFEY, A. & ATKINSON, P. (1996): "Making Sense of Qualitative Data: Complimentary Research Strategies". Sage Publications, London.

COHEN, M. & BACDAYAN, P. (1994): "Organizational Routines Are Stored as Procedural Memory: Evidence from a Laboratory Study", in *Organization Science*, Vol. 5, No.4, November, pp.554-568.

COLLIS, D.J. (1994): "Research Note: How Valuable are Organizational Capabilities", in *Strategic Management Journal*, Vol.15, 143-152.

COLLIS, D.J. (1991b): "A Resource-Based Analysis of Global Competition: The Case of The Bearings Industry", in *Strategic Management Journal*, Vol.12, pp.49-68.

CONNER, K. (1991): "A Historical Comparison of Resourced-Based Theory and Five Schools of Thought within Industrial Organization Economics: Do We Have a New Theory of the Firm?", in *Journal of Management*, Vol.17, pp.121-154.

CONNER, K. & PRAHALAD, C. (1996): "A Resource-Based Theory of the Firm: Knowledge Versus Opportunism", in *Organization Science*, Vol.7, No.5, pp.477-501.

COOL, K. & SCHENDEL, D. (1988): "Performance Differences among Strategic Group Members", in *Strategic Management Journal*, Vol.9, No.3, pp.207-223.

CRONBACH, L.J. (1946): "Response Sets and Test Validity", in *Educational and Psychological Measurement*, Vol.6, pp.475-494.

DACHLER , H.P. (1997): "Does the Distinction between Qualitative and Quantitative Methods Make Sense?", in *Organization Studies* 1997, 18/4, pp. 709-724

DANNEELS, E. (2002): "The Dynamics of Product Innovation and Firm Competences", in *Strategic Management Journal*, Vol.23, Nr.12, December.

DAVENPORT, T. (1993): "The Need of Radical Innovation and Continuous Improvement? Integrate Process Reengineering and TQM", in *Planning Review*, Vol.21, No.3, May-June, pp.7-12.

DEBACKERE, K. & VAN LOOY, B. & VLIEGEN, J.(1997): "Process View on Managing Quality during the Creation of Technical Innovations: Lessons from Field research", in *R&D Management*, Vol.27, No.3, pp.197-211.

DENRELL, J. & FANG, C. & WINTER, S. (2003): "The Economics of Strategic Opportunity", in *Strategic Management Journal*, Vol.24, pp.977-990.

DENZIN, N. & LINCOLN, Y. (1994): "Handbook of Qualitative Research". SAGE Publications, London.

DESS, G.G. & ORIGER N.K.(1987): "Environment, Structure, and Consensus in Strategy Formulation: A Conceptual Integration", in *Academy of Management Review*, Vol.12, No.2, pp.313-330.

DICKSON, T. (2000): "Mastering Strategy. The Complete MBA Companion in Strategy". Redwood Book Ltd, Great Britain.

DIERICKX, Y. & COOL, K. (1989): "Asset Stock Accumulation and Sustainability of Competitive Advantage", in *Management Science*, Vol.35, pp. 1504-1511.

DOSI, G. & MARENGO, L. (1993): "Some Elements of an Evolutionary Theory of Organizational Competences", in ENGLAND, R.W. (e.d.): "Evolutionary Concepts in Contemporary Economics". University of Michigan Press, Ann Arbor, MI.

DOUGHERTY, D. (1989): "Interpretative Barriers to Successful Product Innovation", in Working Paper Marketing Science Institute, pp.89-114.

DOUGHERTY, D. (1990): "Understanding New Markets for New Products", in *Strategic Management Journal*, Vol.11, pp.59-78.

EDWARDS, A.L. (1957a): "Techniques of Attitude Scale Construction". New York.

EDWARDS, A.L. & WALKER, J.N. (1961b): "Social Desirability and Agreement Response Set", in *Journal of Abnormal and Social Psychology*, Vol.62, pp.180-183.

EISENHARDT, K.M. & MARTIN, J.A. (2000): "Dynamic Capabilities: What are they?", in *Strategic Management Journal*, Special Issue, Vol.21, No.10,11, pp.1105-1121.

EISENHARDT, K. & SCHOONHOVEN, C. (1996): "Resource-Based View of Strategic Alliance Formation: Strategie and Social Effects in Entrepreneurial Firms", in *Organization Science*, Vol.7, No.2, March-April, pp.136-148.

ESSER, H. (1975a): "Soziale Regelmäßigkeiten de Befragtenverhaltens". Meisenheim am Glan.

ESSER, H. (1977): "Response Set – Methodische Problematik und soziologische Interpretation", in *Zeitschrift für Soziologie*, Vol.6, pp.253-263.

FARJOUN, M. & LAI, L. (1997): "Similarity Judgements in Strategy Formulation: Role, Process and Implications", in *Strategic Management Journal*, Vol.18, pp.255-273.

FIOL, M. (1991): "Managing Culture as a Competitive Resource: An Identity-Based View of Sustainable Competitive Advantage", in *Journal of Management*, Vol.17, No.1, pp.191-211.

FLICK, U. (1991): "Stationen des qualitativen Forschungsprozesses", in Handbuch Qualitative Sozialforschung. Grundlagen, Konzepte, Methoden und Anwendungen. München 1991, pp.170-174.

FOONG, A. & OLIGA, J. & RASHID, K. (1997): " Entrepreneurs and Intrapreneurs: Common Blood, Different Languages", in *Entrepreneurship, Innovation and Change*, Vol.6, No.1, pp.67-72.

FOSS, N. (1996): "Knowledge-Based Approaches to the Theory of the Firm: Some Critical Comments", in *Organization Science*, Vol.7, No.5, pp.470-476.

FOSS, N. (2003): "The Resource-Based View: Historical Roots, Basic Analysis, Extensions, Criticisms, and Future Development", Bocconi, 24 Feb.

FOSTER, R.I. (1961): "Acquiescent Response Set as a Measure of Acquiescence", in *Journal of Abnormal and Social Psychology*, Vol.63, pp.155-160.

FRIEDRICHS, J. (1973): "Methoden empirischer Sozialforschung". Reinbek.

FÜSER, K. (1997): "Modernes Management. Lean Management, Business Reengineering, Benchmarking und viele andere Methoden". C.H. Beck, München.

GERGEN, K. J. (1994b): "Toward the Transformation in Social Knowledge", 2nd Ed., London, Sage.

GILBERT, M. & CORDEY-HAYES, M. (1996): "Understanding the Process of Knowledge Transfer to achieve Successful Technological Innovation", in *Technovation*, Vol.16, No.6, pp.301-312.

GRANT, R. (1991): "The Resource-Based Theory of Competitive Advantage: Implications for Strategy Formulation", in California Management Review, Vol.33, No.3, pp.114-135.

GRANT, R. (1995): "Contemporary Strategy Analysis: Concepts, Techniques, Applications". Blackwell Publishers, Cambridge, Massachussetts.

GRANT, R. (1996): Toward a Knowledge-Based Theory of the Firm", in *Strategic Management Journal*, Vol. 17, pp. 109-122.

GRANT, R. & SPENDER, J. (1996): "Knowledge and the Firm: Overview", in *Strategic Management Journal*, Vol.17, pp.109-122.

GRATH, M.G. & MILLAN, M. I. & VENTKATARAMAN, S. (1995): "Defining and Developing Competence: A Strategic Process Paradigm", in *Strategic Management Journal*, Vol.16, pp.251-275.

GRIFFIN, A. & PAGE, AL. (1996): "PDMA Success Measurement Project: Recommended Measures of Product Development Success and Failure", in *Journal of Product Innovation Management*, Vol. 13, No.6, pp.478-496.

GRÜMER, K.W. (1974): "Beobachtungs-Techniken der Datensammlung 2". Stuttgart.

GLASER, B.C. & STRAUS, A.L. (1967): "The Discovery of Grounded Theory: Strategies for Qualitative Research". Aldine, Chicago.

GLASER, B.C. & STRAUS, A.L. (1979): "Die Entdeckung gegenstandsbezogener Theorie: Eine Grundstrategie qualitativer Sozialforschung", in HOPF, C. & WEINGARTEN, E. (1969): "Qualitative Sozialforschung". Klettverlag. Stuttgart, pp. 91-111.

GUTH, W. & GINSBERG, A. (1990): "Guest Editors' Introduction: Corporate Entrepreneurship", in *Strategic Management Journal*, Vol. 11, pp.5-15.

HALL, R. (1993): "A Framework Linking Intagible Resources and Capabilities to Sustainable Competive Advantage", in *Strategic Management Journal*, Vol.14, pp.607-618.

HAMEL, G. (2000): "Leading the Revolution". Harvard Business School Press, Boston, Massachusetts.

HAMEL, G. & PRAHALD, C.K. (1989): "Strategic Intent", in *Havard Business Review*, Vol.67 May-June, pp. 63-76

HAMEL, G. & PRAHALD, C.K. (1994): "Competing for the Future". Havard Business School Press, Boston, MA.

HAMERI, A. (1996): "Technology Transfer between Basic Research and Industry", in *Technovation*, Vol.16, No.2, pp.51-57.

HAMMOND, P.E. (1968): "Sociologists at Work: Essays on the Craft of Social Research". Garden City, Doubleday, NY.

HAN, S. (1996): "Structuring Relations in On-The-Job Networks", in *Social Networks*, Vol.18, pp.47-67

HANNAN, M. & FREEMAN, J. (1984): "Structural Inertia and Organizational Change", in *American Sociological Review*, Vol.49, pp.149-164.

HAYES, R. & WHEELWRIGHT, S. & CLARK, K. (1988): "Dynamic Manufacturing: Creating the Learning Organisation". Free Press, New York.

HEIKKILÄ, J. & CORDON, C. (2002): "Outsourcing: A Core or Non-Core Strategic Management Decision?", in *Strategic Change*, Jun-Jul.2002, pp.183-193.

HELFAT, C. (1994): "Firm-specifity in Corporate Applied R&D", in Organization Science, Vol.5, No.2, pp.173-184.

HELFAT, C. (1997): "Know-How and Asset Complementarity and Dynamic Capability Accumulation: The Case of R&D", in *Strategic Management Journal*, Vol.18, No.5, pp.339-360

HELFAT, C. & PETERAF, M. (2003): "The Dynamic Resource-Based View: Capability Lifecycles", in *Strategic Management Journal*, Vol.24, pp.997-1010.

HISRICH, R.D. & PETERS, M.P. (1984): "Internal Venturing in Large Cooperations: The New Business Unit", in *Frontiers of Entrepreneurship Research*, Babson College, Wellesley, MA, pp.321-342.

HOOPES, D. & MADSEN, T. & WALKER, G. (2003): "Guest Editors' Introduction to the Special Issue: Why is there a Resource-Based View? Toward a Theory of Competitive Heterogeneity", in *Strategic Management Journal*, Vol.24, pp.889-902.

HOPF, C. & WEINGARTEN, E. (1979): "Qualitative Sozialforschung". Stuttgart.

HREBINIAK, L.G. & SNOW, C.C. (1982): " Top Management Agreement and Organizational Performance", in *Human Relations*, Vol.35, 1139-1158.

HYMAN, H. *et al*. (1954): "Interviewing in Social Research". Chicago.

IANSITI, M. (1992a): "Technology Integration: Exploring the Interaction between Applied Science and Product Development", in Harvard Business School Working Paper, No.92-026, Havard Business School, Boston, MA.

IANSITI, M. (1992b): "Technology Development and Integration: An Empirical Study of the Interaction between Applied Science and Product Development", in Harvard Business School Working Paper, No.93-024, Havard Business School, Boston, MA.

IANSITI, M. & CLARK K.B. (1995): "Integration and Dynamic Capability: Evidence from Product Development in Automobiles and Mainframe Computers", in *Industrial and Corporate Change*, Vol.3, pp.557-605.

ITAMI, H. & ROEHL, T.W. (1987): "Mobilizing Invisible Assets". Havard University Press.

JACOB, E. (1987): "Qualitative Research Traditions: A Review", in *Review of Educational Research*, Vol. 57, No.1, pp.1-50.

JELINEK, M. (1979): "Institutionalizing Innovation". Praeger, New York.

JOHNSON, D. & HOOPES, D. (2003): "Managerial Cognition, Sunk Costs, and the Evolution of Industry Structure", in *Strategic Management Journal*, Vol.24, pp.1057-1068.

JOSSEY, B. (1992): "What Makes a Team Work?", in *Organizational Dynamics*, Autumn, pp.38-44.

KAPLAN, R. & NORTON, D. (1996): "The Balanced Scorecard: Translating Strategy into Action". Harvard Business School Press, Boston, Massachusetts.

KAPLAN, R. & NORTON, D. (2001): "The Strategy-Focused Organization: How Balanced-Scorecard Companies Thrive in the New Business Environment". Harvard Business School Press, Boston, Massachusetts.

KATZENBACH, J. & SMITH, D. (1994): "The Disciplin of Teams", in *Havard Business Review*, March-April, pp.111-124.

KATZENBACH, J. & SMITH, D. (1993): "The Rules for Managing Cross-Functional Reengineering Teams", in *Planning Review*, Vol.21, No.2, pp.12-17.

KEMPKES, U. & MAYER, F. (1996): "Management der Lernprozesse. Konzepte und praktisches Vorgehen bei der gestalteten Veränderung im Unternehmen", in *Wissenschaftsmanagement*, Vol.3.

KENNEDY, M.M. (1976): "Generalizing from Single Case Studies", in *Evaluation Quarterly*, Vol. 3, November, pp.661-678.

KLANDT, H. (1996): "Zum Stand der akademischen Forschung und Lehre im Bereich der Kleinen und Mittleren Unternehmen und der Unternehmensgründungen in Deutschland", in PLEITNER, H.J.: "Bedeutung und Behauptung der KMU in einer neuen Umfeldkonstellation." Beiträge zu den "Recontres de St.Gall", Universität St.Gallen.

KOGUT, B & ZANDER, U. (1996): "What Firms Do? Coordination, Identity, and Learning", in *Organization Science*, Vol.7, No.5, September-October, pp.502-518.

KOHLI, M. (1978): ""Offenes" und "geschlossenes" Interview: Neue Argumente zu einer alten Kontroverse", in *Soziale Welt*, Vol.29, pp.1-25.

KNOTT, A. (2003): "The Organizational Routines Factor Market Paradox", in *Strategic Management Journal*, Vol.24, pp.929-943.

KRAUSE, G. (1998): "Turn Your Strategy into Action", in *ZBP*, January-February, p.17.

KURATKO, D. (1995): "Developing Entrepreneurship Within Organizations Is Today's Challenge", in *Entrepreneurship, Innovation, and Change*, Vol.4, No.2, pp.99-109.

KURATKO, D. & MONTAGNO, R. & HORNSBY, J. (1990): "Developing an Intrapreneurial Assessment Instrument for an Effective Corporate Entrepreneurial Environment", in *Strategic Management Journal*, Vol. 11, pp.49-58.

LANDRY, M. (1995): "A Note on the Concept of 'Problem' ". Organization Studies.

LAZARSFELD, P.F. *et al*. (1984): "Einige Funktionen von qualitativer Analyse in der Sozialforschung", in HOPF, C. & WEINGARTEN, E. (eds): "Qualitative Sozialforschung", Stuttgart, pp.41-90.

LEARNED, E & CHRISTENSEN, K. & ANDREWS, K. & GUTH, W. (1969): "Business Policy: Text and Cases". Irwin, Homewood, IL.

LEE, T.W. (1999): "Using Qualitative Methods in Organizational Research". Sage, Thousand Oaks, CA.

LEONARD-BARTON, D. (1992): "Core-Capabilities and Core-Rigidities: A Paradox in Managing New Product Development", in *Strategic Management Journal*, Vol.13, pp.111-125.

LEVITT, B. & MARCH, J. (1988): "Organisational Learning", in *Annual Review of Sociology*, Vol.14, pp. 319-340.

LIPPMAN, S. & RUMELT, R.(2003): "The Payments Perspective: Micro-Foundations of Resource Analysis", in *Strategic Management Journal*, Vol.24, pp.903-927.

LOCH, C. & TAPPER, U. (2002): "Implementing a Strategy-Driven Performance Measurement System for an Applied Research Group", in *The Journal of Product Innovation Management*, Vol.19, pp.185-198.

LONG, C. & VICKERS-KOCH, M.(1995): "Using Core Capabilities to Create Competitive Advantage", in *Organizational Dynamics*, Summer, pp.7-22.

LOPEZ, F. (1997): "Precusores de la Teoría de los Recursos y Capacidades". Working paper presented within the course of "Strategy and Organization", University Autónoma de Barcelona.

LOPEZ, F. (2001): "Factores Condicionantes de la Ventaja Competitiva y de los Resultados de las Agencias de Viaje en Espana: Un Estudio Empírico de sus Aspectos estratégicos más relevantes", Doctoral dissertation, Universitat Autònoma de Barcelona.

LOPEZ, F. & VECIANA, J.M. (2004): "Enfoque Estructural vs Recursos y Capacidades: Un Estudio Empírico de los Factores Clave de Éxito de las Agencias de Viaje", Revista Europea de Dirección y Economía de la Empresa, Vol.13, Nr.1, pp.11-24.

LUEGER, M. & SCHMITZ, C. (1984): "Das offene Interview: Theorie- Erhebung- Rekonstruktion latenter Strukturen". Wien, pp.9-15, 158-164.

MACOBY, E. & MACOBY, N.: "The Interview: A Tool of Social Science", in LINDZEY (1954), pp.449-487.

MACOBY, E. & MACOBY, N.: "Das Interview: Ein Werkzeug der Sozialforschung", in KÖNIG, R. (1972): "Das Interview". Köln. pp.37-85.

MAHLBERG, T. (1996): "Business Strategy". Working paper presented within the course of "Strategy and Organization", EDP Programme, University Autónoma de Barcelona.

MAHONEY, J. & PANDIAN, J. (1992): "The Resource-Based View Within The Conversation of Strategic Management", in *Strategic Management Journal*, Vol.13, pp.363-380.

MAKADOK, R. (2003): "Doing the Right Thing and Knowing the Right Thing to Do: Why the Whole is Greater than the Sum of its Parts", in *Strategic Management Journal*, Vol.24, pp.1043-1055.

MAKHIJA, M. (2003): "Comparing the Resource-Based and Market-Based Views of the Firm: Empirical Evidence from Czech Privatization", in *Strategic Management Journal*, Vol.24, pp.433-451.

MARCH, J. (1991): "Exploration and Exploitation in Organisational Learning", in *Organization Science*, Vol. 2, pp.71-87.

MARINO, K. (1996): "Developing Consensus on Firm Comptencies and Capabilities", in *Academy of Management Executive*, Vol.10, No.3, pp.40-52.

MARITAN, C. & BRUSH, T. (2003): "Heterogeneity and Transferring Practices: Implementing Flow Manufacturing in Multiple Plants", in *Strategic Management Journal*, Vol.24, pp.945-959.

MASON, E. (1949): "The Current State of the Monopoly Problem in the US", in *Havard Law Review*, Vol.62, pp.1265-1285.

MAYRING, P. (1991/1996): "Einführung in die qualitative Sozialforschung: Eine Anleitung zu qualitativem Denken". Psychologie Verlagsunion, München.

McEVILY, S. & CHAKRAVARTHY, B. (2002): "The Persistence of Knowledge-Based Advantage: An Empirical Test for Product Performance and Technological Knowledge", in *Strategic Management Journal*, Vol. 23, pp. 285-305.

MESSIK, S.(1968): "Response Sets", in *International Encyclopedia of the Social Sciences*, Vol. 13, pp. 492-496.

MEYER, M. (1995): "Der Integrative Marketing Ansatz". Vorlesungsseminar in Marketing, University of Augsburg.

MILES, M.B. (1979): "Qualitative Data as an Attractive Nuisance: The Problem of Analysis", in *Administrative Science Quarterly*, Vol. 24, December, pp.590-601.

MILES, R. & SNOW, C. (1978): "Organizational Strategy, Structure and Process". McGraw-Hill, New York.

MILES, M.B & HUBERMANN, A.M. (1994): "Qualitative Data Analysis: An Expanded Sourcebook (2nd ed.) Thousand, Oaks, Sage, CA.

MILLER, A. (1998): "Strategic Management". Irvin/McGraw-Hill, (3rd ed.), Boston.

MILLER, D. (2003): "An Asymmetry-Based View of Advantage: Towards an Attainable Sustainability", in *Strategic Management Journal*, Vol.24, pp.961-976.

MILLER, D. & SHAMSIE, J. (1996): "The Resource-Based View of the Firm in two Environments: The Hollywood Film Studios from 1936 to 1965", in *Academy of Management Journal*, Vol.39, No.3, pp.519-543.

MINTZBERG, H. (1973): "Strategy-Making in Three Modes", in *California Management Review*, Vol.16, No.1, pp.44-53.

MUGLER, JOSEF (1998): "Betriebswirtschaftslehre der Klein- und Mittelbetriebe, Bd1". Springer Verlag. Wien.

MUGLER, JOSEF (1999): "Betriebswirtschaftslehre der Klein- und Mittelbetriebe, Bd2". Springer Verlag. Wien.

MUNOZ, D. (1997): "La Teoría de Recursos y Capacidades". Working paper presented within the course of "Strategy and Organization", University Autónoma de Barcelona.

NELSON, R.&WINTER, S. (1982): "An Evolutionary Theory of Economic Change". Belknap,Cambridge,MA.

O'DELL, C. & GRAYSON, C. (1999): "Knowledge Transfer: Discover Your Value Proposition", in *Strategy and Leadership*, March-April, pp.10-15.

PENROSE, E. (1959): "The Theory of the Growth of the Firm". Basil Blackwell, London.

PENTLAND, B. & RUETER, H. (1994): "Organizational Routines as Grammers of Action", in *Administrative Science Quarterly*, Vol.39, pp.484-510.
PERTERAF, M. (1993): "The Cornerstones of Competitive Advantage: A Resource-based View", in *Strategic Management Journal*, Vol.14, pp.179-191.

PETERAF, M. & BERGEN, M. (2003): "Scanning Dynamic Competitive Landscapes: A Market-Based and Resource-Based Framework", in *Strategic Management Journal*, Vol.24, pp.1027-1041.

PISANO, G. (1994): "Knowledge, Integrating, and the Locus of Learning: An Empirical Analysis of Process Development", in *Strategic Management Journal*, Vol.15, pp.85-100.

POLANYI, M. (1966): "The Tacit Dimension". Anchor Day, New York.

PORTER, M.E. (1980): "Competitive Strategy: Techniques for Analyzing Industries and Competitors". The Free Press, New York.

PORTER, M.E. (1985): "Competitive Advantage". The Free Press, New York.

PORTER-LIEBESKIND, J. (1996): "Knowledge, Strategy, and the Theory of the Firm", in Strategic Management Journal, Vol.17, pp. 93-107.

POWELL, T.C. (1995): "Total Quality Management as Competitive Advantage: A Review and Empirical Study", in *Strategic Management Journal*, Vol.16, 15-37.

PRAHALAD, C. & HAMEL, G. (1990): "The Core-Competence of the Corporation", in *Havard Business Review*, May-June, pp.79-91.

PRIEM, R.L. & BUTLER, J.E.(2001): "Is the Resource-Based 'View' a Useful Perspective for Strategic Management Research?", in *Academy of Management Review*, Vol.26, No.1, pp.22-40.

QUINN, J.B (1979): "Technological Innovation, Entrepreneurship, and Strategy", in *Sloan Management Review*, pp.19-30.

QUINN, W.V.O. (1960): "Word and Object". Cambridge, MA, MIT Press.

REINECKE, J. (1991): "Interviewer- und Befragtenverhalten. Theoretische Ansätze und methodische Konzepte". Opladen.

RICHARDSON, S.A. & DOHRENWEND, B.S. & KLEIN, D. (1984): "Die Suggestivfrage, Erwartungen und Unterstellungen im Interview", in HOPF, C. (1984): "Qualitative Sozialforschung". Stuttgart, pp.205-231.

RINDOVA, V. & TAYLOR, S.: "Dynamic Capabilities as Macro and Micro Organizational Evolution". Working Paper. University of Maryland, published on the Internet.

RODE, U. (1996): "Von Anderen lernen- Mit Benchmarking Leistungspotentiale ermitteln und nutzen", in *Neues Verwaltungsmanagement*, Vol.12.

ROSENBLOOM, R.S. & CHRISTENSEN, C.M. (1994): "Technological Discontinuities, Organizational Capabilities, and Strategic Commitments". Oxford University Press.

ROUSE, M.J. & DAELLENBACH, U.S. (1999): "Rethinking Research Methods for the Resource-Based Perspective: Isolating Sources of Sustainable Competitive Advantage", in *Strategic Management Journal*, Vol.20, No.5, pp.487-494.

ROUSE, M.J. & DAELLENBACH, U.S. (2002): "More Thinking on Research Methods for the Resource-Based Perspective", in *Strategic Management Journal*, Vol. 23, pp. 963-967.

RUEFF, M. (1997): "Assessing Organizational Fitness on a Dynamic Landscape: An Empirical Test of the Relative Inertia Thesis", in *Strategic Management Journal*, Vol.18, pp.837-853.

RUGMAN, A. & VERBEKE, A. (2002): "Edith Penrose's Contribution to the Resource-Based View of Strategic Management", in *Strategic Management Journal*, Vol.23, No.8, pp.769-780.
RUMELT, R. (1974): "Strategy, Structure, and Economic Performance". Harvard University Press, Cambridge. MA.

RUMELT, R. (1984): "Towards a Strategic Theory of the Firm", in LAMB, R. (ed.): "Competitive Strategic Management". Prentice-Hall, Englewood Cliffs, NJ, pp.556-570.

RUMELT, R. & SCHENDEL, D. & TEECE, D. (1991): "Strategic Management and Economics", in *Strategic Management Journal*, Vol.12, pp.5-29.

RUSSEL, R. (1995): "An Investigation of Some Organizational Correlates of Corporate Entrepreneurship: Toward a Systems Model of Organizational Innovation" , in *Entrepreneurship, Innovation, and Change*, Vol.4, No.4, pp.295-314.

RYCROFT, R. & KASH, D. (2000): "Steering Complex Innovation", in *Research Technology Management*, pp.18.

SAKAKIBARA, M.(1997): "Heterogeneity of Firm Capabilities and Cooperative Research and Development: An Empirical Examination of Motives", in *Strategic Management Review*, Vol.18 pp.143-164.

SAVAGE, G.T. & BLACK, J.A. (1995): "Firm-Level Entrepreneurship and Field Research: The Studies in Their Methodological Context", in *Entrepreneurship Theory and Practice*, Spring 1995.

SCHALL, M. (1983): "A Communication-Rules Approach to Organizational Culture", in *Administrative Science Quarterly*, Vol.28, No.4, pp.557-581.

SCHENDEL, D. (1990): "Introduction to the Special Issue on Corporate Entrepreneurship", in *Strategic Management Journal*, Vol. 11. pp.1-3.

SCHENDEL, D. (1992): "Introduction of the Summer 1992 Special Issue on 'Strategy Process Research' ", in *Strategic Management Journal*, Vol.13, pp.1-4.

SCHEUCH, E.K. (1973): "Das Interview in der Sozialforschung, in KÖNIG, R.: "Handbuch der empirischen Sozialforschung". Stuttgart, pp.66-190.

SCHON, D.A. (1963): "Champions for Radical Inventions", in *HBR*, March-April.

SCHUMPETER, J. (1934): "Theory of Economic Development". Harvard University Press, Cambridge.

SCHUMPETER, J. (1950): "Capitalism, Socialism, and Democracy". New York, Harper & Row.

SCHÜTZE, F. (1976): "Zur Hervorlockung und Analyse von Erzählungen thematisch relevanter Geschichten im Rahmen soziologischer Feldforschung", in Arbeitsgruppe Bielefelder Soziologen: Kommunikative Sozialforschung. München, pp.159-260.

SELZNIK, P. (1957): "Leadership in Administration", in HARPER & ROW, New York.

SENGE, P. (1990): "The Fifth Disciplin". New York, Doubleday.

SENGE, P. (1990): "The Leader's New Work: Building Learning Organizations", in *MIT Sloan School of Management*, Fall, pp7-23.

SÉROR A. C. (1996): "Action Research for International Information Technology Transfer: A Methodology and a Network Model", in *Technovation*, Vol.16, No.8.

SHAPIRO, C. (1989): "The Theory of Business Strategy", in *RAND Journal of Economics*, Vol.20, No.1, pp.125-137.

STEPHENSON, K. (1995): "The Formation and Incorporation of Virtual Entrepreneurial Groups", in *Entrepreneurship Theory and Practice*, Spring Edition, pp.35.

SLEVIN, D. & COVIN, J. (1990): "Juggling Entrepreneurial Style And Organizational Structure: How To Get Your Act Together", in *Sloan Management Review*, Winter, pp.43-53.

SNOW, C. & THOMAS, J. (1994): "Field Research Methods in Strategic Management: Contributions to Theory Building and Testing", in *Journal of Management Studies*, Vol.31, No.4, pp.457-480.

SPANOS, Y. & LIOUKAS, S. (2001): "An Examination into the Causal Logic of Rent Generation: Contrasting Porter's Competitive Strategy Framework and the Resource-Based Perspective", in *Strategic Management Journal*, Vol.22, pp.907-934.

SPENDER, J. (1996): "Making Knowledge the Basis of a Dynamic Theory of the Firm", in *Strategic Management Journal*, Vol.17, Winter Special Issue, pp.45-62.

STALK, G. & EVANS, P. & SHULMANN, L. (1992): "Competing on Capabilities: The New Rules of Coporate Strategy", in *Havard Business Review*, March-April, pp.57-69.

STOPFORD, J.M. & BADEN-FULLER, C.W. (1994): "Creating Corporate Entrepreneurship", in *Strategic Management Journal*, Vol.15, pp.521-536.

SWINK, M. (2002): "Product Development-Faster, On-Time", in *Research Technology Management*, July-August.

SYMON, G. & CASSEL, C. (1994): "Qualitative Methods in Organisational Research: A Practical Guide". Sage, London.

SZULANSKI, G. (1996): "Exploring Internal Stickiness: Impediments to the Transfer of Best Practice Within the Firm", in *Strategic Management Journal*, Vol.17, pp.27-45.

TALLMANN, S. & FLADMOE-LINDQUIST, K. (2002): "Internationalization, Globalization, and Capability-Based strategy", in *California Management Review*, Vol.45, No.1, pp.116.

TEECE, D.J. (1980): "Economics of Scope and the Scope of the Enterprise", in *Journal of Economic Behavior and Organization*, Vol.1, pp.223-247.

TEECE, D.J. (1982): "Towards an Economic Theory of the Multi-Product Firm", in *Economic Behavior and Organization*, Vol.3, pp.39-63.

TEECE, D.J. (1984): "Economic Analysis and Strategic Management", in *California Management Review* Vol.26, No.3, pp.87-110.

TEECE, D.J. (1988): "Technological Change and the Nature of the Firm", in DOSI, G. *et.al*. (eds): "Technical Change and Economic Theory". Printer Publishers, New York, pp.256-281.

TEECE, D.J. (1998): "Capturing Value from Knowledge Assets: The New Economy, Markets for Know-how, and Intangible Assets", in *California Management Review*, Vol.40, No.3, pp.55-79.

TEECE, D.J. & PISANO, G. (1994): "The Dynamic Capabilities of Firms: An Introduction", in *Industrial and Corporate Change*, Vol.3, No.3, pp.537-556.

TEECE, D.J. & PISANO, G. & SHUEN, A. (1990): "Firm Capabilities, Resources, and the Concept of Strategy". Working Paper, University of California, Berkely.

TEECE, D.J. & PISANO, G. & SHUEN, A. (1997): "Dynamic Capabilities and Strategic Management", in *Strategic Management Journal*, Vol. 18, No.7, pp.509-533

TESCH, R. (1990): "Qualitative Research: Analysis Types and Software Tools". Falmer Press, New York.

TEUSCHER, W. (1959): "Die Einbeziehung des Forschers in die Untersuchungsgruppe durch Status- und Rollenzuweisungen als Problem der empirischen Sozialforschung", in *Kölner Zeitschrift für Soziologie und Sozialpsychologie*, Vol.11, pp.250-256.

TREACY, M. & WIERSEMA, M.(1995): "The Disciplin of Market Leaders: Choose Your Customers, Narrow Your Focus, Dominate Your Market". Reading, Addison-Wesley, MA.

WERNERFELT, B. (1984): "A Resource-Based View of the Firm", in *Strategic Management Journal*, Vol.5, pp.171-180.

WERNERFELT, B. (1995): "The Resource-Based View of the Firm: Ten Years After", in Strategic Management Journal, Vol.16, pp.171-174.

WERNERFELT, B. & MONTGOMERY, C. (1988): "Tobin's Q and the Importance of Focus in Firm Performance", in *American Economic Review*, Vol.78, No.1, pp.246-250.

WILLIAMSON, O. (1975): "Markets and Hierarchies: Analysis and Antitrust Implications". Free Press, New York.

WILLIAMSON, O. (1985): "The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting". Free Press, New York.

WINTER, S. (1987): "Knowledge and Competence as Strategic Assets", in TEECE, D. (ed): "The Competitive Challenge" , in *Center for Research in Management*, Berkeley CA. pp159-184.

WINTER, S. (1996): "Four Rs of Profitability: Rents, Resources, Routines, and Replication", in Resource-Based and Evolutionary Theories of the Firm, Montgomery C (ed). Kluver: Norvell, MA, pp.147-178.

WINTER, S. (2003): "Understanding Dynamic Capabilities", in *Strategic Management Journal*, Vol.24, pp.991-995.

WOLCOTT, H.F. (1992): "Posturing in Qualitative Inquiry“, in M.D. Le Compte, MILLROY, W.L & PREISSLE, J. (Eds.): "The Handbook of Qualitative Research in Education". Academic Press, New York, pp.3-52.

VAN DE VEN, A.(1986): "Central Problems in the Management of Innovation", in *Management Science*, Vol. 32, pp.590-608.

VECIANA, J.M. (1973): "Organización". Ed. CESEA, Madrid

VECIANA, J.M. (1996): "Generación y Desarrollo de Nuevos Proyectos Innovadores. "Venture Management" o "Corporate Entrepreneurship", in *Economia Industrial*, No.310, pp.79-90.

VON HIPPEL, E.(1977): "Successful and Failing Internal Corporate Ventures: An Empirical Analysis", in *Industrial Marketing Management*, Vol.6, pp.163-174.

YIN, R.K. (1981a): "The Case Study as a serious Research Strategy", in *Knowledge: Creation, Diffusion, Utilization*, Vol. 3, September, pp.97-114.

YIN, R.K. (1989): "Case-study Research. Design and Methods". SAGE Publications, Inc., Newbury Park.

ZAHRA, S. & PEARCE, J. (1994): "Corporate Entrepreneurship in Smaller Firms: The Role of Environment, Strategy, and Organization", in *Entrepreneurship, Innovation and Change*, Vol.3, No.1, pp.31-44.

ZANDER, U. & KOGUT, B. (1995): "Knowlege and the Speed of the Transfer and Imitation of Organizational Capabilities: An Empirical Test", in *Organization Science*, Vol.6, No.1, January-February, pp.76-91.

12.2 Content of Tables / Figures

Figures

12.3 Original Level I-Questionnaire (German Language)

Einfluss des Projektes auf den Unternehmenserfolg / Kompetenz- und Leistungspotentialentwicklung / Zielerreichung

1. Durch das Projekt lernte das Unternehmen Budgetpläne einzuhalten.
2. Das Projekt verbesserte die Fähigkeit Beschäftigungsziele zu erreichen.
3. Durch das Projekt lernte die Firma das Koordinieren und Einhalten von wichtigen Zeitplänen / Terminen
4. Das Projekt verbesserte das Fähigkeit Qualitäts-standardsziele (zb:ISO 9000) zu erreichen
5. Durch das Projekt wurde die Verläßlichkeit der Firma gesteigert
6. Durch das Projekt lernte die Firma Kostenvorgaben einzuhalten
7. Das Projekt verbesserte die Fähigkeit Produktivitätsziele zu erreichen
8. Das Projekt verbesserte die Fähigkeiten Serviceanforderungen / -vorgaben zu er-reichen.
9. Das Projekt verbesserte das Erreichen der Kundenzufrieden-heitsvorgaben
10. Das Projekt erhöhte die Produktivität des Unternehmens
11. Das Projekt verbeserte die Wettbewerbspostition des Unternehmens
12. Das Projekt verbesserte die Profitabilität des Unternehmens
13. Das Projekt erhöhte die Gesamteinnahmen des Unternehmens
14. Das Projekt verbesserte die Gesamtleistung des Unternehmens
15. Das Projekt hatte einen negativen Einfluß auf unsere Profitabilität
16. Wir wären besser dran ohne dieses Projekt

Beurteilung der Unternehmenskultur im Hinblick auf Intrapreneurship

17. Die Unternehmensleitung ermutigt Regeln "auszulegen" bzw. anzupassen
18. Die Unternehmensleitung hat Erfahrung mit Innovationen
19. Die Unternehmensleitung ermutigt zu Projektaktivitäten
20. Die Unternehmensleitung übernimmt Patenshaft/Sponsorship
21. Es wird bei Mitarbeitern die Risiken übernehmen oftmals anerkannt wenn sie erfolgreich sind.
22. Die Unternehmensleitung ermutigt zum kalkulierten Risiko
23. Kleine und/oder experimentelle Projekte werden unterstützt
24. Risiken einzugehen wird als positive Eigenschaft gesehen
25. Es gibt eine zweite Chance nach einem Misserfolg

26. Fehler werden als Lernerfahrung gesehen
27. Es ist wichtig im Arbeitsalltatg beschäftigt auszusehen
28. Es ist schwierig Teams zu bilden
29. Stellenbeschreibung und Tätigkeitsprofile sind wichtig für den einzelnen Mitarbeiter
30. Die Unternehmensleitung erkennt frühzeitig ob einzelne Mitarbeiter das Potential haben innovative Projekte erfolgreich durchzuführen
31. Abgrenzung des Arbeitsplatzes gegenüber den übrigen Abteilungen wichtig
32. Finanzielle Mittel für Projekte sind vorhanden
33. Es gibt oft Konflikte mit der Firmen Budgetplanung
34. Es werden zusätliche Anreize / Vergütung / Ausgleich zur Verfügung gestellt
35. Es gibt verschiedenen Möglichkeiten für finanzielle Unterstützung für innovative Projekte
36. Es wird eine bestimmte Zeit für Problemlösungen mit Mitarbeitern zur Verfügung gestellt
37. Es herrscht eine transparente, auf Vertrauen basierende Firmenkultur
38. Fehler sind erlaubt
39. Es herrscht wenig Bürokratie
40. Es erfolgt eine räumliche Zusammenlegung des gesamten Teams
41. Teams sind oft aus mehreren Abteilungen zusammengesetzt
42. Zugehörigkeit und Kontinuität während des gesamten Projekts gilt nicht nur für die technische Kernabteilung, auch für Marketing etc.
43. Einsatz von "selbstverantwortlichen /-bestimmten" Teams
44. Verstärkte Einbindung der Mitarbeiter in die Entwurfs- und Planungsphase
45. Es gibt ein innovatives Mitarbeiter Vorschlagsystem
46. Erhöhte Autonomie der Mitarbeiter bei zu treffenden Entscheidungen ist gewährleistet.
47. Karrieremöglichkeiten entstehen in erster Linie im Zusammenhang mit dem Projekt
48. Die Leistungsbeurteilung des Einzelnen basiert in erster Linie auf dem Projekterfolg
49. Kriterien zur Leistungsbeurteilung werden in erster Linie mit Bezug auf die Projektarbeit festgesetzt
50. Verstärkte Einbeziehung der Mitarbeiter bei Verhandlungen mit Kunden und Lieferanten