The Evolution of Dominant Logic in Relation to Strategic Inertia in Software Ventures

D I S S E R T AT I O N
of the University of St. Gallen,
Graduate School of Business Administration,
Economics, Law and Social Sciences (HSG)
to obtain the title of
Doctor Oeconomiae

submitted by

Daniela Patricia Blettner
from
Germany

Approved on the application of

Prof. Georg F. von Krogh, PhD
and
Prof. Dr. Günter Müller-Stewens

Dissertation no. 3374

Difo-Druck GmbH, Bamberg 2008
The University of St. Gallen, Graduate School of Business
Administration, Economics, Law and Social Sciences (HSG) hereby
consents to the printing of the present dissertation, without hereby
expressing any opinion on the views herein expressed.

St. Gallen, October 15, 2007

The President:

Prof. Ernst Mohr, PhD
Acknowledgements

First, I would like to thank my advisor Prof. Georg von Krogh and my co-advisor Prof. Guenther Mueller-Stewens for their continued support and invaluable help along the entire process. I am particularly indebted to Dr. Simon Grand for his incredible help in this process and innumerable very inspiring discussions that incited my interest for a great variety of topics but more importantly Simon, you showed me how to look at things in a very different and fascinating way. Thank you!

Many thanks for invaluable suggestions and encouragement in various stages of this project to Philipp Tuertscher, Dr. Daniel Bartl, Dr. Michael Neugarten, Dr. Torsten Schmid, Dr. Harald Tuckermann, Dr. Florian Kappler, Dr. Maria Rumyantseva, Dr. Sebastian Spaeth, Dr. Stefan Haefliger and many more dear friends and colleagues at RISE Management Research and the HSG.

I would also like to thank Prof. Pierre Cossette, an amazingly inspiring mentor and friend who invited me to study the cognitive mapping technique with him at UQAM in Montreal. Thank you, Pierre, for engaging innumerable times in highly stimulating discussions and facilitating my understanding of the cognitive mapping technique!

I don’t know how I can thank Prof. Rich Bettis, an incomparable mentor, colleague and friend in this whole journey and who helped me with discussions and support that helped me enormously to turn this project into a success. I will never forget our first phone call, our first conversation on the balcony at Kenan-Flagler, our many exciting projects that we have been doing ever since our initial discussions on dominant logic. Rich, I will start to thank you by buying you a good cup of coffee! I will never forget the time in Chapel Hill, thank you!

I would like to thank the partner companies who made this project possible and were ready to spend time and shared my enthusiasm for “dominant logic.” They also helped me ground my thinking of dominant logic in many ways and helped me understand some of the puzzles and brought up new, exciting ones.

I would like to thank my partner, Dr. Sterett Mercer, for his incredible support that helped me in many ways to finish this endeavor. I also would like to thank our little
daughter Juliana Christine who helped me getting up early to finish the editing process and rewards me every day with her incredible joy for life.

I would like to thank the Swiss National Science Foundation for their generous support that enabled me to learn about the origin of the construct of dominant logic and realize the project that I had envisioned.

Last but certainly not least, I would like to thank my father, Manfred Blettner, for his unconditional support through many years of study.

Chapel Hill, January 2008

Daniela Blettner
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Abstract

Why do managers resist change? While this question has incited a lot of curiosity among researchers in the field of strategic management, it remains inconclusive. Therefore, I analyze the evolution of mental models or ‘dominant logic’ in order to reveal insights about the difference in the constitution of mental models. Based on the original definition of ‘dominant logic’ as “knowledge structure (of a firm’s business strategy)” (Prahalad and Bettis, 1986), a knowledge-based view of the firm (Nonaka, 1994; Grant, 1996; Spender, 1996; Von Krogh and Grand, 2000) is adopted. In addition, this research relies on insights from cognitive social psychology (e.g. Ginsberg, 1990) and evolutionary theory (Nelson and Winter, 1982, Dosi and Nelson, 1994) in order to elicit patterns in the evolution of managers’ mental models in six software ventures, divided into 3 age groups according to a central hypothesis on strategic inertia in three age categories.

Zusammenfassung

1 Introduction

1.1 Research Question and Research Objective

In order to explain managers’ resistance to change, I explore the process of the evolution of patterns in mental models of CEOs by drawing on early firm history. Specifically, I approach the conundrum of strategic inertia (e.g. Huff, Huff, and Thomas, 1992) in organizations by analyzing the emergence of dominant logic (Prahalad and Bettis, 1986; Bettis and Prahalad, 1995) in six new and emerging ventures in the German-speaking software industry.

Originally defined as “the way in which managers conceptualize the business and make critical resource allocation decisions” (Prahalad and Bettis, 1986, 490), dominant logic offers many avenues for addressing diverse controversies in strategic management. First, by its very nature, the construct of dominant logic relates to cognitive social psychology (e.g. Ginsberg, 1990) and, therefore, intentionality. Second, dominant logic is related to path dependence (Arthur, 1989; Liebowitz et al., 1990): “Sensitive dependence on initial conditions” (Bettis and Prahalad, 1995, 11) and, hence, is grounded in evolutionary theory (Nelson and Winter, 1982), making dominant logic an emergent selection mechanism (Burgelman, 1983; Noda and Bauer, 1996). Third, the original authors define dominant logic as knowledge structure (Prahalad and Bettis, 1986; Bettis, 2003), opening up the theoretical realm of explanation offered by a knowledge-based view of the firm.

These perspectives characterize dominant logic as enabling or limiting the firm’s strategic action. The fact that Prahalad and Bettis compare dominant logic with a ‘filter’ (Prahalad and Bettis, 1995) and a ‘blinder’ (Prahalad, 2004) reflects the construct’s ambiguous nature. Therefore, dominant logic relates to strategic action in a positive or negative way as it enables managers to notice (Starbuck and Milliken, 1988) by filtering other things from their attention (Von Krogh and Roos, 1996).
Hence, over time it might constrain managers’ attention to the extent that they do not see alternatives, resulting in ‘cognitive rigidities’ (Von Krogh and Roos, 1996) and ‘cognitive inertia’ (e.g. Hodgkinson, 1997; Hodgkinson and Wright, 2002; Bettis, 2003, Prahalad, 2004).¹ In this line of thought, two related questions arise:

(1) How does dominant logic evolve?
(2) What is the relation of the evolution of dominant logic to strategic inertia?

### 1.2 Empirical Focus, Research Design and Methodology

In accordance with the above questions, I created a specific, comparative case study design (Yin, 1994; Eisenhardt, 1989/1991/2007). Based on the assumption that increasing firm age is positively related to ‘cognitive rigidities’ (Von Krogh and Roos, 1996), I created a base line of twelve ventures, divided into three age groups, of the German-speaking software market, located in Munich (Germany) and Zurich/St. Gallen (Switzerland). I studied six of the ventures in depth over time. Group A encompasses ventures founded in the 1980s; Group B includes ventures founded in the 1990s; and Group C contains ventures founded since 2000. As the ventures in each group realized their market entry at a similar point in time, I assume that they confronted comparable context and environmental munificence.

In contrast to existing cognitive studies on the evolution of inertia (e.g. Barr, Stimpert, and Huff, 1992; Reger and Palmer, 1996; Hodgkinson, 1997) drawing on written documents and analyzing their objects of study retrospectively, I conducted semi-structured, face-to-face interviews while travelling repeatedly to each company site over a period of twenty months. The longitudinal data collection, together with the three age-group design, enables me to compare the evolution of dominant logic(s) in real-time.
Given that dominant logic is “stored as a shared cognitive map (or set of schemas) among the dominant coalition” (Prahalad and Bettis, 1986, 491), I consider cognitive mapping technique (Eden and Spender, 1998; Huff, 1990; Fiol and Huff, 1992; Walsh, 1995; Huff, 1990; Eden, 1992) a very appropriate way to collect and analyze data.

More precisely, this research uses one causal mapping technique, which is “a cognitive map where the relationships are restricted to a may-lead-to, has-implications-for, supports, or cause-effect type of relationship” (Eden and Ackermann, 1998). I adopt this approach to cognitive mapping for a variety of reasons. First, it represents and, hence, operationalizes the concept of causality contained in dominant logic. Second, Huff (1990) among others recognized this type of cognitive mapping for its integrity, internal consistency and stability of the actor’s map over time. Third, it is the most fundamental and most recognized type of cognitive mapping (Axelrod, 1976; Huff, 1990).

1.3 Measure of “Dominance” of Logic

Since dominant logic is a structure of knowledge about a firm’s business strategy, I refer to a knowledge-based view of the firm (Kogut and Zander, 1992; Nonaka, 1994; Nonaka and Takeuchi, 1995; Grant, 1996; Spender, 1996; Tsoukas, 1996; Von Krogh and Grand, 2000). An eventual step in the organizational knowledge creation process, as suggested by Von Krogh and Grand, is ‘competition for coherence’ (Von Krogh and Grand, 2000). While Von Krogh and Grand (2000) put forward the image of a ‘competition for coherence,’ the authors do not expand on either the conceptualization or the operationalization of coherence. In an attempt to understand and measure how dominant logic evolves, I conducted an extensive literature search in various fields. The field of philosophy (e.g. Bonjour, 1985) was particularly fruitful and in a more applied sense, so were legal studies (e.g. Alexy, 1983). Within the great array of material and the ongoing debate on the concept of coherence in philosophy, the most adequate conceptualization of coherence for this purpose is the one by Bonjour (1985).
Based on Bonjour’s epistemological requirements, I reviewed measures of cognitive mapping technique in order to find operationalizations for the various dimensions. The measure that I consider the most adequate is the coherence of the cognitive maps by calculating a link-to-node ratio (Eden et al., 1992), effecting a centrality analysis, a domain analysis, and a cluster analysis. The combination of these analyses is executed on each map of three observation phases (t₁=summer 2004; t₂=spring 2005; t₃=winter 2005) in the software companies. Only this comprehensive procedure of capturing the change in coherence rather than the change of single variables and links (e.g. Barr et al., 1992) allows me to grasp the evolution of the dominant logic over time in alignment with this study’s theoretical assumptions.

1.4 Relevance of Research

In the following, I outline the relevance of this research for theory and for practice. While the challenge to contribute to theory is primary, this research may be of interest for practitioners in several ways.

1.4.1 Relevance for Theory

This research uses dominant logic as a central theory while taking up various theoretical challenges. One challenge this research faces is the exploration of the evolution or ‘condensation’ (Bettis and Wong, 2000) of cognitive maps. Huff suggested, “Study[ing] cognition as an emergent phenomenon, interactively linked to experience”² (Huff, 1997, 950). A second challenge confronted by this research is the interrelation of the patterns of the emerging dominant logic and strategic inertia, which according to Meindl et al. (1994) will be decisive for future studies: “In the future the most important studies will clearly show linkages between cognition, behaviour, and organizational outcomes” (Meindl et al., 1994, 293).³

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² Emphasis added by author.
³ Emphasis added by author.
Moreover, this research is an empirical study that pursues one of the four future directions for cognition research proposed by Huff (1997). She encourages researchers to “provide empirical evidence, including direct reports from practice, to ground further theoretic development” (Huff, 1997, 949). While this statement might apply to many other disciplines in a similar way, the empirical study provided here appears to be particularly apt for two reasons. First, the composition of the empirical sample of software ventures and their division into three groups provides insights into patterns of the evolution of dominant logic. Second, the choice of methodology, i.e. cognitive mapping technique, ensures the congruence of the theoretical background and the empirical analysis.

I enhance the chances for generating valuable theory by two means. Data analysis was executed in a rigorous manner, which I ensured by working with a trained psychologist and specialist in cognitive mapping. In addition, the setting of data collection is an organizational setting, which adds value to future research according to Huff: “If we can go beyond schema and other received theories that refer to more controlled settings, we might have a first-mover advantage in cognitive science” (Huff, 1997, 950). Similarly, Schwenk claims: “Since many of the simplification processes have been examined exclusively in laboratory research, an attempt should be made to document their existence and effects in field setting” (Schwenk, 1984, 126). Hence, this research contributes to cognitive science, by using a particular field of organizations, and to organization science, by addressing two relevant streams of research of this field. First, in times of constant change the generation of variety of strategic action is pivotal (Drucker, 2001). Second, the study contributes to strategic decision making relating to Eisenhardt’s suggestion: “First on the agenda is cognition” (Eisenhardt, 1989b, 32). From the integration of the different fields with organization science in combination with rigorous methods and questions in cognitive science, this research promises original, valuable and relevant results. Therefore, it fulfils one more issue on Huff’s agenda of future cognitive science, namely her suggestion to “investigate issues that link cognition to broader agendas of organization science and
simultaneously produce the insight for a truly organizational cognitive science” (Huff, 1997, 950).

Finally, this research differentiates between cognitive content and process, but does recognize the tight inter-linkage between the two: “In the future, most interesting and productive studies will integrate content and process” (Meindl et al., 1994, 293). In addition, Bettis and Wong (2003) emphasize the relevance of process: “Considering the process aspects of dominant logic suggests a richer construct than is often envisioned” (Bettis and Wong, 2003, 353). While the interrelation between content and process has widely been discussed in a theoretical manner, this research intends to reveal the relationship of content and process in the empirical sample.

1.4.2 Relevance for Practice

Prior to explication of the intended relevance of this research for practice, I exclude one type of recommendations. The intent is not to advise the ventures to enhance their rationality and, therefore, comprehensiveness or formality in decision-making (Zahra, Irland, Gutierrez, and Hitt, 2000; Das and Teng, 1999).

Rather the contribution of this research is in line with Baron:

“What we want, ultimately, is not entrepreneurs who are paralyzed into inaction by efforts to conduct totally logical assessments of all possible risks and benefits, but rather ones who pause and reflect sufficiently to increase their chances that they—and their societies—will prosper” (Baron, 1998, 291).

Practitioners may gain value from this research by the very illustration of the two-edged sword nature of dominant logic. Specifically, I show the specific patterns of evolution of dominant logic in combination with the venture’s increase in inertia. While relying on the results, which emerged from the comparative case study, I depict the differences in perception, action, and interpretation that eventually formed—or did not form—a cognitive frame or dominant logic enabling or constraining the venture’s

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4 Emphasis added by author.
strategic action. Of course, the interest here is to get as close as possible to the divide between enabling and restraining cognitive patterns for strategic action. Insights of this type may constitute value for entrepreneurs and managers by enhancing their awareness of these patterns and enable them to cope with challenges of cognitive limitations and rigidities as well as missing or abundant coherence within their firms. As I link causality with the underlying argumentation structure, while referring to the concrete historical event in the venture’s evolution, effects of path dependence (Arthur, 1989/1990; David, 1985; Liebowitz et al., 1990/1995) and the path-breaking and path-creating events (Garud and Karnøe, 2001) will become obvious.

A particular value of this study resides in the use of the cognitive mapping technique. First, the ventures that participate in my research gain insights simply from the application of the mapping technique (e.g. Eden and Ackermann, 1998) and from an in-depth-analysis together with the feedback interview. Second, practitioners who are not included in my sample benefit from an application of the cognitive mapping technique on various ventures; they may apply it in order to increase the quality of their own strategic decision-making by the value attributed to cognitive maps.

1.5 Structure of Dissertation

In the following, I present the structure of this study. Chapter 2 reviews the existing research on the construct of dominant logic. I analyze the construct of dominant logic on various levels such as epistemological assumptions, theories used, operationalizations, and empirical fields. This analysis shows the gap in research, which is approached by this dissertation. In the second part of the literature review, I discuss additional relevant theories. In part three, I discuss the dependent variable of this research: Strategic Inertia. Chapter 3 exposes the methodology. Here, I refer to the epistemological assumptions underlying this research and argue for the choice of methodological approach, data collection and analysis. In Chapter 4, I present the findings that emerged from the analysis of the cognitive maps in comparative real-time case study with particular attention to the argumentative structure, the evolution,
the justification patterns, and the dependent variable, strategic inertia. I rule out alternative explanations and discuss the results in the light of existing research. In Chapter 5, I present the study’s contribution to theory and managerial practice. I conclude with an outline of the study’s limitations (Chapter 6) and directions for further research (Chapter 7).

Figure 1 shows the underlying model of this study:

![Research Model](image)

Figure 1: Research Model
2 Theoretical Building Blocks

Dominant Logic is a multi-faceted construct. An extensive literature review is necessary to explore the many avenues proposed by C.K. Prahalad and Richard A. Bettis and numerous other contributors. Rather than present all results of the literature review that I performed, I focus on the relevant theoretical building blocks when approaching the research gap, i.e. the evolution of the dominant logic and the relation between evolutionary patterns and strategic inertia.

First, I refer to the multiple understandings of dominant logic in the existing literature in order to prepare the foundation for my further arguments. Second, I give an outline of the dimensions of dominant logic that are relevant for this study and present my point of view. Third, I argue for the concept of coherence and its evolution, which I determined as central to my understanding of dominant logic. Fourth, I put forward my conceptualization of strategic inertia and refer to hypotheses on the relationship between dominant logic and strategic inertia and to other moderating variables affecting this relation.

2.1 The Construct of Dominant Logic

In this chapter, I analyze the current state of the literature of dominant logic with a focus on the evolutionary aspects. More precisely, I illustrate the multiple facets of dominant logic while referring to the construct’s definition, its underlying theoretical assumptions, and its operationalizations. Based on this grounding, I point out the research gap in this discussion: the evolution of dominant logic and its relation to strategic inertia.
2.1.1 Definition

When forming the construct of dominant logic, Prahalad and Bettis wondered why firms did not select the strategic actions that would be *rationally* the most appropriate strategic moves (Prahalad and Bettis, 1986; Bettis, 2000; personal conversation, 2005). Therefore, dominant logic is an exploration into ‘adaptive rationality’ (Von Krogh, 1990) or ‘thinking patterns’ (Weick, 1979) of the dominant coalition for further explanation of their strategic behavior.

Dominant Logic is defined in many ways, notably, “mental maps developed through experience in the core business” (Prahalad and Bettis, 1986, 486), a ‘knowledge structure’ (Prahalad and Bettis, 1986, 490) or ‘set of schemas’ (Prahalad and Bettis, 1986, 491) referring to the firm’s business strategy. A very frequently cited definition of the construct is the “way in which managers conceptualize the business and make critical resource allocation decisions—be it in technologies, product development, distribution, advertisement or in human resource management” (Bettis and Prahalad, 1986, 490).

Due to the favorable reception of the original article in the academic community, Prahalad and Bettis decided to present in a second paper their retrospective and extension of the concept of dominant logic. While relying on theory as complex adaptive systems (Waldrop, 1992; Holland, 1992 cited in: Bettis and Prahalad, 1995), the authors understand dominant logic in their revision and extension as an ‘information filter’ or a “filter through which management considers relevant data” (Bettis and Prahalad, 1995). This view, however, implies a shift of the concept along several dimensions:

1. **Level of analysis**: while dominant logic applied to the dominant coalition or the top management team in the first paper, it refers to the entire organization in their second paper.
2. **Underlying theory**: whereas dominant logic is clearly routine in cognitive psychology (Bettis, 2000) in the initial paper, in their subsequent contribution,
the authors ‘retrofit’ (Von Krogh and Roos, 1996) the concept to the theory of complex adaptive systems.

(3) Epistemological assumptions: the authors also perform a reorientation on the epistemological level, i.e. from a rather objectivist paradigm to a subjectivist paradigm.

(4) Explanatory intention: whereas in the first paper, dominant logic is intended to explain the unclear linkage between diversification and firm performance and, therefore, operates as a moderator, in the 1995 paper, dominant logic is considered an antecedent of the relationship for strategic change and innovation.

Eventually, Bettis and Wong (2003) restrict dominant logic more concretely to the top management team, but the cognitive structure remains social: “We use the term to refer to the mindset, causal map, or mental model of the top management team” (Bettis and Wong, 2003, 353). While the intention in their 1995 paper was to be inclusive, Bettis’s 2003 contribution attempts to solidify the level of analysis while moving the concept from a ‘relative’ and ‘emergent’ notion to a functional level.

When reconsidering the definition of dominant logic as the “way in which managers conceptualize the business and make critical resource allocation decisions—be it in technologies, product development, distribution, advertisement or in human resource management,” we notice that dominant logic combines behavioural and cognitive elements. Hence, it is referred to as ‘behavioural logic’ (Von Krogh and Roos, 1995, 157) and precedes other hybrid concepts such as ‘habits of thought’ (Veblen, 2000) or ‘cognitive routines’ (Cohen and Bacdayan, 1994). Bettis and Wong (2003) express this hybrid nature inherent to the construct of dominant logic: “By its very nature, dominant logic represents the dominant way in which managers think and act” (Bettis and Wong, 2003, 351). According to the latter authors, dominant logic includes management processes, namely administrative tools to accomplish goals and make
decisions in business. However, Bettis clearly recognizes the origin of dominant logic in cognitive psychology: “We felt that it [dominant logic] was grounded more in cognitive psychology than any other established academic discipline” (Bettis, 2000, 168).

2.1.2 Theoretical Foundations

The prevalent and consistent theoretical foundation of dominant logic is cognitive psychology. Within cognitive psychology, the authors specify four sources of dominant logic: operant conditioning, the power of paradigms, pattern-recognition process, and cognitive bias (Prahalad and Bettis, 1986; Bettis and Wong, 2003). Great variance along two dimensions characterizes the theories underlying these four sources: (1) their positioning on the dichotomy of behaviorism and cognitivism and (2) their level of analysis. While the power of paradigms, pattern-recognition, and cognitive bias are cognitive concepts, operant conditioning refers to a single animal stimulus-(reinforcement)-response (Skinner, 1953) and is the most pervasive form of behaviorism. The application of operant conditioning to human behaviour results in an individualistic concept. Pattern recognition, as evidenced in the chess-playing game and cognitive bias (Kahneman and Tversky, 1974), also apply to the individual as a level of analysis. Paradigms (Kuhn, 1970) arise from science. The paradigm is supported by a certain scientific community and then by the people who apply the learned paradigm on the periphery of the scientific community.

More specifically, within cognitive psychology, the authors are interested in cognitive resistance. This becomes obvious at several instances in the authors’ paper. The authors refer for instance to ‘unlearning’ of outdated dominant logic(s) (Argyris and Schön, 1978; Starbuck and Hedberg, 1977; Prahalad and Bettis, 1986). This concept relates to the concept of ‘cognitive inertia’ (e.g. Hodgkinson, 1997; Hodgkinson and Wright, 2002; Tripas and Gavetti, 2000), which is prevalent in the discussion of the current literature in strategic management. The relationship between dominant logic and inertia is a particularly promising path for further research. Bettis and Wong
consider the relationship between the latter concept, dominant logic and learning a promising avenue for further research.

All of the above-mentioned concepts are somehow linked to the basic principle of the ambiguous nature of enabling and constraining effects of path dependence (Arthur, 1989/1990; David, 1985; Liebowitz and Margolis, 1990/1995) or ‘Monday-logic’ (Simon, 1997). This reference to path dependence is evoked in the authors’ initial paper on the issue referring to “sensitive dependence on initial conditions” (Bettis and Prahalad, 1995, 11) and is maintained throughout the discussion (e.g. Bettis and Wong, 2003). Based on the principle of the retrospect causality of events (Hall and Taylor, 1996; Hay, 2002; North, 1990; Raadschelters, 1998), path dependence theory illustrates how positive local feedback pushes the firms that have adopted a certain learning style into a lock-in, where the efficiency of the chosen path makes the trying of alternative choices (of action) unlikely (Levitt and March, 1988).

In line with the path dependence effects, dominant logic refers to evolutionary theory (e.g. Nelson and Winter, 1982; Dosi and Nelson, 1994). More precisely, I conceptualize dominant logic as a refined filtering process (Von Krogh and Roos, 1996) and an evolving ‘interpretation system’ (Weick, 1995).

Furthermore, in their 1995 paper the authors refer to complex adaptive systems (Axelrod and Cohen, 1999; Holland, 1995). Central to the discussion of complex adaptive systems is the concept of a steering function, which generates the variety that matches the environments’ variety (Ashby, 1956). Consequently, Bettis and Wong (2003) consider the existence and characteristics of a steering function for choosing among the multiple logics. Complex adaptive systems theory also reflects on the possibility of defining and reaching the ideal state between chaos and order, which is of interest but constitutes a challenge on the research methods.

In conclusion, the most prevalent and consistent theory underlying dominant logic is cognitive psychology. Other theories have been ‘retrofitted’ (Von Krogh and Roos,
1996, 730) into the concept; however, they are much less consistent. An example of this is the reference to complex adaptive systems.

When introducing dominant logic as a variable moderating the relationship between diversification and performance (Prahalad and Bettis, 1986), the authors clearly base their argument on a *contingency view* (Fayol, 1983; Lawrence and Lorsch, 1967; Burns and Stalker, 1961; Woodward, 1965; Donaldson, 1996). However, with the continuation of the original authors’ discussion on dominant logic, a shift of the position of dominant logic within a contingency paradigm was realized, i.e. dominant logic is no longer seen as a moderator, but rather as an antecedent for strategic change. Von Krogh et al. (2000) or Jarzabkowski (2001) reconcile these two perspectives in a comprehensive model underlying their empirical studies. Further contributions suggest variation on the dependent variable; notably, these contributions refer to strategic action (e.g. Von Krogh and Grand, 2000) or strategic change or inertia (e.g. Jarzabkowski, 2001) and firm survival (e.g. Lampel and Shamsie, 2000).

![Evolution of Concept in Dominant Logic Discussion](image)

Figure 2: Evolution of Concept in Dominant Logic Discussion
This development of dominant logic as a moderating variable to an independent variable reflects the increase in importance of this concept in the literature. However, there is little research on dominant logic as a dependent variable.

2.1.3 Operationalization

The literature on dominant logic offers several operationalizations of the construct. In the following, I discuss the contributions along the following dimensions:

(1) Behavioral Operationalization
(2) Behavioral and Cognitive Operationalization
(3) Behavioral and Cognitive Operationalization on Multiple Levels

(1) Behavioral Operationalization
Grant (1988) suggests operationalizing dominant logic based on the three critical specific corporate level functions: allocating resources between businesses, formulating and coordinating business unit strategies, and setting and monitoring performance targets for business units. Derived from the statement of Prahalad and Bettis, who claim, “Dominant logic is reflected in the administrative tools to accomplish goals and make decisions” (Prahalad and Bettis, 1986, 491), this definition is quite concrete and renders the construct to some extent ‘researchable’, albeit the notion remains broad.

Grant clearly articulated the limitations to operationalization, which he attributes to its cognitive nature: “The problem of dominant logic is that it is a cognitive concept - is it a mind set or a world view or a conceptualization of the business. As such its applicability either to empirical research or to formulating and implementing diversification strategy, is limited” (Grant, 1988).6 He mentions that Prahalad and Bettis themselves refer to dominant logic as the ‘elusive linkage’7 and adds that as

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6 Emphasis added by the author.
7 Emphasis added by the author.
dominant logic is a cognitive concept, it is difficult to make progress in specifying the strategic characteristics of business units that determine relatedness at the corporate level. An example of the application of this operationalization is the paper by D’Aveni, Ravenscraft, and Anderson (2004), where the authors comprehend dominant logic as the expenditure profile of the firm’s resource portfolio.

(2) Behavioral and Cognitive Operationalization

A second group of authors adhere to an operationalization that contains behavioral and cognitive elements. This resonates very clearly in those operationalizations by Ginsberg (1990): “It manifests itself often, in an implicit theory of competition and value creation. It is embedded in the standard operating procedures, shaping not only how the members of the organisation act but also how they think” (Prahalad, 2004, 172).8

Von Krogh et al. (2000) operationalize dominant logic in line with the definition given by Prahalad and Bettis (1986): “The way in which managers conceptualize their business and make critical resource allocation decisions” (Prahalad and Bettis, 1986, 490). Von Krogh et al. (2000) compared the logic of strategic positioning of two telecommunication firms, Ericsson and Nokia, with their resource allocation. Von Krogh et al. (2000) define dominant logic as containing various dimensions and propose an operationalization resulting from abduction in line with the concept of bandwidth offered by Bettis and Prahalad (1995). The bandwidth depends on the categories that the dominant logic provides (Von Krogh et al., 2000, 86). Their categorization consists of two domains (internal/external environment) and six categories (people, culture, product and brand/competitor, customer and consumer, and technology). The definition the authors take up from the original paper is “the ways in which managers conceptualize the business and make critical resource allocation decisions” (p. 490). The authors conclude from their comparison of numbers and frequency of categories scored in by Ericsson and Nokia that there might be a positive correlation between the bandwidth of the dominant logic and

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8 Emphasis added by the author.
performance of companies confronted with break points or a strong increase of the dynamic of their environments.

Despite some of the proposed models addressing the interrelation of thinking and action, the elaboration of the interactive effect is not yet satisfactory. This might be due to difficulty in conceptualization and operationalization of the evaluation function. There is a certain tendency to perceive the evaluation system as external to the cognitive process.

(3) Behavioral and Cognitive Operationalization on Multiple Levels

Cote et al. (1999) and Jarzabkowski (2001) and Obloj et al. (2000) offer an even more comprehensive operationalization. The latter authors’ operationalizations contain behavioral and cognitive elements on multiple levels.

The authors, who discuss the case of acquisition of firms, see the dominant logic of the mother firm (SNC) as rooted in its ‘administrative heritage’, which they define as “cultural values and historical practices that have been successful in the firm’s core business” (Cote et al., 1999, 928). Hence, the authors operationalize the dominant logic in (1) conceptualization of the role of the firm and acquisitions, (2) criteria for choice and evaluation, and (3) organizing and management principles. On a more abstract level, the authors come to an interpretative and interrelated scheme of thinking, acting and evaluating of the concrete strategic action by the management team.

Similarly, Jarzabkowski (2001) suggests understanding dominant logic as the composite of three components: embedded administrative processes, top team thinking and acting, and the underlying strategic orientation of the firm. The potential of this operationalization relies on the fact that these processes are all encompassing and there is inevitably an interaction effect included. Cohesion is the self-reinforcing interaction between top management team thinking and acting, strategic orientation, and administrative processes (Jarzabkowski, 2001, 28). The author aims to conclude
from the cohesion of the three elements on the organization’s (in this case the University of Warwick) responsiveness to the environment or other variety of action.

Even more comprehensive is the operationalization offered by Obloj et al. (2000). The authors present a model of dominant logic consisting of a paradigm of environment and organization, dominant routines, strategic choices, and learning experiences with the former being on the operational level and the latter on the strategic level. In their model, the authors, however, do not elaborate on the interplay of the various categories, as this does not appear to be their main concern. The authors’ intention consists rather in elaborating concrete rules, which are attributable to dominant players and a set that relates to peripheral players in the four markets considered in the study. From their paper, it does not become obvious how the researchers treated the four influencing paradigms that constitute their construct of dominant logic.

The inclusiveness of the definition of dominant logic and the epistemological and theoretical variety lead to a great number of different operationalizations of dominant logic. The theoretical foundations in combination with the epistemological assumption also explain the great variety of empirical applications. Several theories and concepts retrofitted (Von Krogh and Roos, 1996) to the dominant logic. In addition, one has to take into consideration that these theories themselves are subject to a major shift. This, in turn, renders the construct even more dynamic.

2.1.4 Research Gap: Underlying Assumptions and Evolution of Dominant Logic

Despite the great number of contributions, research on dominant logic remains inconclusive. This may be due to the high diversity of contributions, which arise from the above-described shifts in the construct.

While the moderating effect of dominant logic on the diversification–performance link is widely accepted, it is controversial whether dominant logic leads to change or inertia. This research claims that the evolutionary patterns of dominant logic have the
potential of revealing their different effects. Some authors even go as far as to claim: “[…] it is obvious that a longitudinal analysis and thus an analysis of the firm’s dominant logic is called for” (Von Krogh and Grand, 2000, 85).

A few authors allude to the evolution of dominant logic in their research. The authors either explicitly refer to evolutionary theory or allude to an evolutionary conceptualization. In the following, I show how existing literature treats the evolution of dominant logic. Since the underlying assumptions of validation are decisive for explaining evolutionary patterns, I focus my analysis on the authors’ conceptions on criteria for validation when presenting their understanding of the evolution of dominant logic. By criteria for validation, I mean the criteria that explain why the authors assume that some form of knowledge or existence is preferable to another one. While in some papers, this validation is explicit, others simply refer to the relevance of the relationship between certain characteristics of dominant logic and its evolution.

I discern the following criteria for validation underlying the various studies:

(1) Clarity and Consistency
(2) Cohesiveness
(3) Temporal Consistency
(4) Comprehensiveness
(5) Institutional Legitimacy
(6) Congruence of Resources
(7) Consensus

(1) Clarity and Consistency
According to Lampel and Shamsie (2000), clear and consistent dominant logic must lead to a high degree of consistency in the strategic moves that each of the business units within a diversified firm undertake. Moreover, the authors argue, “joint ventures that depart from General Electrics’s dominant logic are likely to be terminated more
quickly than joint ventures that are more consistent with the corporation’s dominant logic” (Lampel and Shamsie, 2000).

In their research on GE, the authors show that a deviation from the corporate dominant logic results in organizational decline. In other words, consistency with the corporate dominant logic is the major criterion for the validity and value of the preponderant logic of the joint ventures.

The focus here is on the intention of dominant logic to create consistency in the way that business units approach decisions, which, the authors, in turn, expect to result in consistency between the actions of the business units and that of the guiding dominant logic as formulated by corporate headquarters.

(2) Cohesiveness
In her analysis of dominant logic at the University of Warwick, Jarzabkowski (2001) understands the evolution of dominant logic as an increase in cohesiveness. More precisely, Jarzabkowski (2001) claims that:

1) When there are interlocks of the three elements: (a) components of embedded administrative processes, (b) top team thinking and acting, and (c) the underlying strategic orientation of the firm, a cohesive dominant logic emerges that aids rapid and coherent strategic action.

2) Cohesive dominant logic is self-reinforcing and has low adaptive capacity, predisposing inertial action patterns.
3) Cohesive dominant logic will be associated with organizational decline as environments change. Cohesive dominant logic tends to prevent second order learning.

In sum, the author argues that cohesiveness of elements of dominant logic leads to strategic action and strategic inertia. Given this set-up, the author cannot reveal the
ambiguity contained in the construct of dominant logic. Although the author provides a rich description, the process of cohesion remains vague and ambiguous.

(3) Consistency
Cote, Langley, and Pasquero (1999), who discuss the case of acquisition of firms by a large corporation (SNC), perceive the process of evolution or change of dominant logic, along the dimensions of (1) conceptualization of the role of the firm and acquisitions, (2) criteria for choice and evaluation, and (3) organizing and management principles. The authors argue that the three components have different characteristics and therefore evolve at different rates.

Referring to these differences among the components of dominant logic, the authors explain how this process of dephasing of dominant logic emerges. The authors suggest that the dephasing results from difference in timing of the components of dominant logic. This, in return, results, for instance from fluctuation in management during the acquisitions process. Eventually, dephasing leads to missing adaptation of the dominant logic.

More precisely, the underlying idea is the characterization of knowledge structure by Lyles and Schwenk (1992) as core and peripheral knowledge. Based on this distinction, the authors expose characteristics that justify and explain the difference of the components. On the one hand, the components of dominant logic are partially idiosyncratic to the firm and partially institutionally derived. On the other hand, the authors differentiate the components of dominant logic according to their volatility: whereas the conceptualization of the role of the firm and acquisitions appears to be the most volatile of the three dimensions, the organizing and managing principles is the least changing of these elements.

Even though the authors analyze six acquisitions realized by the Canadian Corporation SNC, they mention that it is a drawback of their study that they cannot compare the change in dominant logic at their focal organization (Cote et al., 1999).
Given that the company is a large corporation, the research has to cope with high complexity due to a long history so that it is hard to discern the evolution of dominant logic.

In sum, I think that the idea of observing the dimensions is very valuable. However, the authors merely allude to the application of the differences and the evolution of a knowledge structure rather than providing a systematic analysis.

(4) Comprehensiveness
Based on longitudinal data from Nokia and Ericsson, Von Krogh et al. (2000) assume that comprehensiveness or diversity of dimensions contained in dominant logic is positively associated with strategic action and firm performance (market share) in a dynamic environment such as the telecommunication industry. The authors rely on the definition of dominant logic as ‘filter’ (Bettis and Prahalad, 1995) and combine it with the original definition based on resource-allocation. From executives’ informed statements, Von Krogh et al. (2000) induced six categories related to internal and external environment defining the bandwidth in the concrete case of Nokia and Ericsson: people, culture, product and brand, competitor, customers and consumer, and technology. More precisely, the number of statements that fall into the above categories defines the bandwidth of a company’s dominant logic. The bandwidth, in turn, determines how the company will react to an increase in the environment’s dynamic (Von Krogh and Grand, 2000).

(5) Institutional Legitimacy
The conceptualization of the evolution of dominant logic put forth by Brien and Slack (2003) is different. When describing the changes that occurred in the professionalization of the English Rugby Union, the authors identify the institutional role and legitimacy as the drivers for the evolution of dominant logic. Precisely, Brien and Slack analyzed several types of changes: interrelationships among concomitant changes in dominant logic of the field, actors, exchange processes and regulatory structures.
The authors claim that the change necessitated cognitive shifts in the values held by the field’s incumbent actors. However, there is no reference to how this shift happens at the level of the individual. In sum, this way of illustrating the change and the evolution of dominant logic brings insights in the evolution of dominant logic at the social level with particular emphasis on the institutional environment.

(6) Resource Congruence
D’Aveni, Ravenscraft and Anderson (2004) associate dominant logic strictly with resource allocation. Based on their study, the authors claim a positive correlation between resource congruence of lines of business with other lines of business and their efficiency and profitability. In other words, the more the expenditure profile of focal business lines of business resembles others in the parent’s portfolio, the more efficient and profitable this line of business is.

(7) Consensus
Tyler and Gnyawali (2002) understand the evolution of cognitive structures as consensus. The authors focus on market innovation activities and analyze a large corporation. The objective for their paper consists in clustering the overlap in consensus across the different departments within the company. This differentiation on the level of ‘consensual validation’ (Weick, 1979) is identified with the dominance of logic. Unfortunately, this research is not over time, hence the idea of consensus is not analyzed dynamically.

This short analysis of the criteria of validation in the explanation of the process of the evolution of dominant logic revealed an extraordinary breadth of validation criteria. The authors allude to most of the criteria of ‘strength’ of beliefs (Donaldson and Lorsch, 1983; Sproull, 1981; Walsh, 1988):

(1) Clarity rather than ambiguity
(2) Internal coherence
In sum, there is no reference to a consistent theory underlying the evolution of dominant logic. The contributions refer to a very varied understanding of criteria for validation of knowledge and therefore a great variation in the conceptualization of the evolution of dominant logic. Frequently, the authors rather describe the process rather than attribute it to specific theoretical assumptions. In order to develop a consistent comprehension for this research, I refer to my own comprehension of logic and the evolution of dominance.

2.2 Conceptualization of ‘Logic’ and ‘Dominance’

In the following, I clarify this study’s understanding of ‘logic’ and the ‘dominance’ of logic because this is essential for the analysis. The notion of ‘dominant logic’ implies an underlying process that explains how the logic becomes dominant. In this section, I draw on Toulmin’s argumentation theory and elaborate how this theory as a determinant of coherence explains the evolution of dominant logic. In short, I provide an explanation for the dominance of logic.

2.2.1 Logic and Validation Criteria

‘Logic’ derives from classical Greek *logos*, originally meaning the word, or what is spoken, but most often said as the study of criteria for the *evaluation of arguments*. In classical terms, the logician distinguishes *good* arguments from *bad* ones. The classical understanding of good argumentation goes back to the *Organon* contained in the *Corpus Aristotelicum*. Aristotle introduces *syllogism* as normative form of reasoning, which constitutes a deductive inference between three terms, i.e. *terminus maior*, *terminus minor*, and *terminus medius* in the form: (1) All humans are mortal. (2) Socrates is human. (3) Socrates is mortal. Of course, there are variations of this
form, however the principles of thought are: (1) $A = B$, (2) $A \neq B$, (3) Some $A = B$, 4) some $A \neq B$.

Comprehending “Logic as study of the methods and principles used to distinguish correct reasoning from incorrect reasoning,”¹⁹ Copi and Cohen (2002) remain within a normative paradigm in textual analysis and argumentation theory. Toulmin (1958), in contrast clearly disagrees with this narrow concept of validity, claiming that all arguments are in principle equal—there is no question of superior or inferior. He allocates a much wider meaning to the term validity, arguing that logic must not be an ‘idealized’ discipline closely connected to mathematics, but must evolve into a discipline based on the practice of argument and seeking closer ties with epistemology (Toulmin, 1975, 254). According to the author, arguments that comply with the logicians’ criterion of formal validity cannot be regarded a representative examples of argument as it occurs in practice. Formal validity in the logical sense, says Toulmin, is neither a necessary nor sufficient condition for soundness of argumentation. Ultimately, the evaluation depends on the problem or the kind of problem. In order to achieve a rational assessment, a discussion about whether the summer is going to be hot, meteorological criteria need to be applied, not logical criteria. In other words, the soundness of argumentation (validity in a broader sense) is an ‘intra-territorial’ rather than an ‘inter-territorial’ notion.

More precisely, the understanding of logic is not only different from normative understanding, but also from a descriptive-normative understanding and can therefore not be interpreted as bias. This means that logical fallacies are part of this type of analysis: Logic is “concerned with understanding propositions and their use in argumentation addressing, for instance, sources of beliefs and ideas, what constitutes valid arguments, theories of language, and theories of modalities, paradoxes and logical fallacies” (Von Krogh and Roos, 1995).

¹⁹ Emphasis added by the author.
Adhering to an understanding of logic as uttered by Toulmin (1988), and Von Krogh and Roos (1995), this research relies on descriptive rather than normative validation criteria.

### 2.2.2 Intuition, Emotion and Rationality

Simon, who understands logic as “drawing conclusions from premises” (Simon, 1957, 131), clearly states: “Because I used logic (drawing conclusions from premises) as a central metaphor to describe the decision-making process, many readers of Administrative Behavior have concluded that the theory advanced here applies only to ‘logical’ decision-making, and not to decisions that involve intuition and judgement. That was certainly not my intent.”

In line with Simon’s understanding and recent contributions on logic, in my understanding of dominant logic, the emotions and the motivation of the same are included in the concept.

The present study defines logic as “the underlying assumptions, deeply held, often unexamined, which form a framework within which reasoning takes place” (Horn, 1983, 1). Logics, which are similar to paradigms (Kuhn, 1970), frames (Bartunek, 1989), interpretive schemes (Ranson et al., 1980), world-views (Lincoln, 1985) and deep structures (Gersick, 1991), are something more than what a person thinks or feels.

Based on the distinction of ethos, pathos and logos in classical rhetoric, Eemeren, Grootendorst, and Henkemans (1996) differentiate between substantive, motivational, and authoritative reasoning. While substantive reasoning refers to inference (how the things in the world about us relate to one another), motivational reasoning refers to emotions, values, desires or motives that can make the claim acceptable to the person to whom it is addressed.
Finally, authoritative reasoning refers to the reliability of the source from which the data are drawn.

Rather than classifying, I understand logic as *encompassing the substantive, motivational, authoritative, and intuitional assumptions*. More generally, this study’s understanding of logic is in line with Simon: “Drawing conclusions from premises” (Simon, 1957, 131). In other words, I see logic as hypotheses *A leading to B*. Furthermore, I claim that logics are *inclusive* rather than *exclusive*. Rather than there being one (right) logic, I assume that various logics consistently compete with each other. In the following, I refer to the differences in logic(s).

### 2.2.3 ‘Dominance’ of Logic

Related to the above discussion on logic, a second question arises, namely, “What renders (a particular) logic dominant?” ‘Dominant’ understood as ‘stronger than others’ imposes another question, notably, “Which is the process whereby a particular logic has become dominant?”

Bettis and Wong (2003) understand ‘dominant’ as follows: “More broadly, it biases knowledge, know-how and skill accumulation into path dependent knowledge pathways ‘preferred’ by the dominant logic” (Bettis and Wong, 2003, 351). Here, the authors refer to the effect of dominance of logic rather than the dominance *per se*. A particularly powerful metaphor used by Bettis and Wong in a recent paper for the process of evolution of dominance is ‘condensation’ (Bettis and Wong, 2003). In physics, condensation signifies an increase in density. More precisely, condensation is the change in matter or substance to a denser phase, such as a gas (or vapor) to a liquid. The process of condensation happens through cooling and/or compression.

Taking up the increase in density, the original definition of dominant logic as ‘knowledge structure’ and ‘cognitive map’ (both: Prahalad and Bettis, 1986) together

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10 The authors also referred to the process as ‘fossilisation’.
with the original theoretical anchorage of dominant logic in cognitive psychology, it seems plausible to assume that evolution of dominant logic can be represented by increase of density of cognitive maps. In other words, certain elements or variables of a given cognitive map increase their density above average (referring to the remaining relations in the cognitive map) and hereby indicates a dominant logic. In sum, the density criterion helps me to distinguish the dominant logic from other logics within a cognitive map.11 Density of cognitive maps is the defined as \( \frac{L}{N(N-1)} \), where \( L \) indicates the number of observed links, and \( N \) is the number of variables in the figure; the denominator, therefore, designates the maximum number of links possible.

However, the process of how cognitive maps or knowledge increases in density or, in other terms, how a core knowledge structure is created is still not clear. In order to clarify this notion, I suggest reflecting on the terms of ‘knowledge’ and ‘structure’ separately.

In this study, I understand knowledge as justified true belief (Nonaka and Takeuchi, 1995). This involves a process of justification. If the latter notion is not a paradox of scientific paradigms,12 we can interpret this process of justification as leading to truth or truthfulness: “Individuals justify[ing] the truthfulness of their observations based on their observations of the world” (Nonaka, Von Krogh, and Voelpel, 2007, 1181). Hence, I explore the notion of truthfulness that underlies this study. In order to do so, I propose considering theories of knowledge creation or theories of truth. Among the three major theories of truth, i.e. correspondence theory of truth (Aristotle; Thomas Aquinas), consensus theory of truth (Pierce; Habermas), and coherence theory of truth (Quine), the latter appears to be the most adequate for my analysis for two main reasons.

11 What is the state that we can talk of sufficient density in order to talk of dominant logic? This question has to be answered in relative terms. The density has to be substantially higher than the remainder of the structures of the maps.

12 Another way to understand ‘justified true belief” would be to interpret the notion as a hybrid between positivistic truth and constructivism.
First, coherence theory refers to the knowledge structure itself; therefore, it is self-contained: “Coherence is primarily an internally determined property of belief states. The justification of individual beliefs is then a secondary, derivative concept” (Bonjou, 1985). In contrast, correspondence theory claims that knowledge is validated by referring to facts in an objective outside world: “Veritas intellectus est adaequatio intellectus et rei, secundum quod intellectus dicit esse quod est, vel non esse quod non est” (Thomas Aquinas, Contr. gent. I, 59. De verit. 1, 2).

According to consensus theory, an argument is valid if there is agreement of all people on earth on the truthfulness of the claim: “darf ich dann und nur dann einem Gegenstand ein Praedikat zusprechen, wenn auch jeder andere, der in ein Gespraech mit mir eintreten koennte, demselben Gegenstand das gleiche Praedikat zusprechen wuerde. […] Die Bedingung fuer Wahrheit von Aussagen ist die potentielle Zustimmung aller” (Habermas, 1973, 219 cited in: Alexy, 1983, 135). Coherence theory, by contrast, approves the validity of knowledge from within the knowledge structure. In other words, the validation is inherent to the knowledge structure. The study of coherence is finite if the object of truth is finite.

Second, coherence theory alludes to the aspect of how the elements of knowledge cohere (<lat. cohaerere) or hang together. Therefore, this theory is particularly appropriate for explaining an increase in density and, of the three theories, describes the process of ‘condensation’ referred to by Bettis and Wong (2003) very well.

Third, when explaining knowledge generation in management literature, reference is made to coherence theory. More precisely, Von Krogh and Grand suggest that knowledge is created by a competition for coherence (Von Krogh and Grand, 2000). However, the authors do not refer to the process in more detail. Therefore, two further questions arise: “How does coherence become manifest in a knowledge structure? And, “How does coherence emerge?”
2.3 Coherence and Evolution of Coherence

Coherence is a key concept in the process of knowledge creation in general and of dominant logic in particular. The objective of this chapter consists in reflecting on coherence and the evolution of coherence.

2.3.1 Coherence: Understanding and Central Requirements

As indicated by its etymological routes, coherent representations are representations in which elements positively relate to one another. In other words, they tend to wax and wane together.¹³

As opposed to fundamentalist theories, coherence theory is characterized by self-referentiality: “According to the coherence theory of empirical justification, as so far characterized, the epistemic justification of an empirical belief derives entirely from its coherence with the believer’s overall system of empirical beliefs and not at all from any sort of factor outside the system” (Bonjour, 1985, 101).

Coherentism denies the validity of the regression argument. In coherentism, justification is a holistic process. P is not justified as a part of some inferential claim of reasoning, but because it coheres with some system of which it forms a part. Usually, the system is taken to be a complete set of beliefs of the individual or group, that is, their theory of the world.

Coherence is explained as follows by Bonjour: “On an intuitive level, coherence is a matter of how the beliefs in a system of beliefs fit together or ‘dovetail’ with each other, so as to constitute one unified and tightly structured whole. And it is clear that

¹³ Coherence (<lat. cohaerere=hang together) is the capability of different waves to generate stationary appearances of inference.
this fitting together depends on logical, inferential, and explanatory relations of many different sorts among the components of the system” (Bonjour, 1985, 107).

Concretely, Bonjour (1985) sets the following conditions for the explication of the concept of coherence:

(a) Coherence must require logical consistency of belief states
(b) Coherence must involve inferential connectedness among beliefs that constitute belief states of both deductive and probabilistic sorts
(c) Coherence must not exclusively make coherence a matter of explanatory connections among the beliefs of belief state
(d) Coherence must admit degrees
(e) Coherence must be symmetrical
(f) Coherence must be precise, quantitative, measurable
(g) Coherence must be a supervening property of belief states

To my understanding, the most important descriptions of coherence given by Bonjour are the first three conditions. The latter descriptive conditions are necessary to understand coherence. The first three conditions, however, define coherence and exclude other understanding, albeit on a very generic level.

In order to see the requirements of coherence in a more applied context, I refer here to legal studies realized by Alexy, which are particularly appropriate in a logic discussion due to the similarity of logic and jurisprudence: “Logic (we may say) is generalized jurisprudence” (Toulmin, 1975, 7).

Relying on the semantic-syntactical concept of support, Alexy defines coherence as “the statement $p_1$ supports the statement $p_2$ if, and only if, $p_1$ belongs to a set of premises, $S$, from which $p_2$ follows logically” (Alexy, 1987, 1). He further differentiates three classes of criteria of coherence, i.e., (1) Properties of the supportive structure constituted by the theory; (2) Properties of concepts applied by the theory (generality/conceptual cross-connections); (3) Properties of the scope
covered by the theory (number of cases/diversity of fields of life). The first two classes appear to be particular appropriate for the endeavor of measuring the evolution of coherence in cognitive maps. Drawing from the list of specific measures proposed by Alexy, I would like to emphasize the following three structural measures: (1) the number of supportive linkages, (2) the length of supportive causal chains, and (3) the connection between supportive causal chains. These measures are not only particularly relevant in Alexy’s conceptualization of coherence, but are also adequate for an investigation in cognitive mapping.

2.3.2 Driver of Coherence: Analysis of Warrant

Whereas above I argued for the characteristics of a coherent knowledge structure, I have not yet provided a comprehensive description of how such a knowledge structure actually evolves. To clarify the emergence of coherence, I refer to Toulmin’s theory of argumentation. Out of the great variety of theories on argumentation (e.g. Hare, 1952; Perelman and Olbrechts-Tyteca, 1958; Eemeren, 1996), Toulmin’s theory is particularly adequate for the purpose of present study since its assumptions on argumentation and logic are compatible with this study’s conception of logic. Second, Toulmin’s theory is the most extensive exploration of argument structure and its representation.

As argued above, Toulmin approaches the study of arguments neither in a normative nor in a normative-descriptive manner (e.g. Copi and Cohen, 2002); he instead approaches the issue in a descriptive manner (Toulmin, 1958). Given his relatively inclusive view, Toulmin is able to propose his general model of argumentation, which was first presented in The Uses of Arguments (1958), referring to a ‘working logic’ (Toulmin, 1958, 9) or an ‘applied logic’ (Toulmin, 1958, 255).

14 Toulmin’s model does not cover all types of argumentation. Therefore, some authors call his model definitory (Alexy, 1983, 120).
When investigating the argumentation as used in very diverse fields such as physics, jurisprudence, and ethics, Toulmin detects a generic pattern of argumentation and develops a well-recognized model of argumentation based on a claim-data-warrant structure.\(^{15}\) The principle elements are claim and data—namely, a contention is made claiming its acceptance. If it is not accepted, the contention has to be justified. This is done by an inference-license: data such as D entitle one to draw conclusions or make claims such as C. These rules are called ‘warrants’. Therefore, a proposition has value due to the warrant, which, on its behalf is supported by backing. In other words, W is true/valid because of B.

![Diagram of Toulmin's Argumentation Model](image)

Figure 3: Toulmin’s Argumentation Model

The content-related elements\(^{16}\) of the theory of argumentation structure are

1. Datum: fact or opinions that the claim is based on.
2. Claim: states standpoint or conclusion.
3. Warrant: inference-license that provides justification for using data as support of the claim.
4. Backing: provides other contentions supporting the warrant.
5. Rebuttal: The condition of rebuttal determines which warrants do not allow for inferring conclusions/claims based on data.

\(^{15}\) The hypothesis-evidence-argument structure as put forth by Lehn (1985) shows many similarities to the claim-data-warrant structure as put forward by Toulmin.

\(^{16}\) Toulmin also refers to the qualifier, which adds the modality (necessary, possible, probable, etc.) or the degree of certainty to the conclusion indicating the degree of force, which the arguers attribute to the claim. However, since this relates purely to the causality it is not refered to here.
The most influential elements of the argumentative structure—beyond the constitutive elements of datum and claim—is the *warrant* since it legitimizes the claim. As opposed to the other extensions of the basic data-claim model of argumentation (i.e. rebuttal, backing), the warrant is the only element that refers directly to the entire causal relationship. Therefore, I focus my subsequent analysis on the warrant as a first step to understanding argumentative structure in general and more particularly the justification within the argumentative structure. With this focus on the analysis of warrant, I see three relevant dimensions of argumentation or justification.\(^\text{17}\)

### 2.3.3 Dimensions of Justification

There are many ways to characterize the warrant in argumentation. The primary question in this context is the following: “When is an assumption taken for granted?” and more importantly, “Why is an assumption taken for granted?” In other words, when analyzing argumentation, the main objective is to find “what are the characteristics of a causal chain in order to protect a claim?”

When reflecting upon the numerous forms of argumentation or justification referred to in argumentation theory, i.e. inductive versus deductive, substantive versus authoritative versus motivational, *pathos* versus *ethos* versus *logos*, intuitive versus rational, I reveal three dimensions:

1. Elaboration of Justification
2. Internal versus External Justification
3. Justification by Temporality versus Justification by Generality

I differentiate the justification patterns along these three dimensions due to several reasons. First and foremost, relevance for the essentials of how a knowledge structure

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\(^{17}\) Subsequently, I refer to argumentation also as justification because the notion of ‘justification’ captures very well the focus on the warrant with reference to the backing.
or a dominant logic is created determined the selection of these dimensions. Second, these dimensions constitute a compromise of categories that are discernible and recognizable, but contain a maximum of relevant information on justification. Third, the categories are general enough in order to facilitate the comparison among argumentative structures and hence create generalizable knowledge.

The types of justification are presented according to their degree of their content-relatedness. While Elaboration of Justification refers to mainly quantitative measures, Justification by Temporality versus Justification by Generality goes as much into content as is generalizable across all arguments of an empirical text, to my understanding here, the maximal condition to still generate generalizable knowledge beyond the specific context.

2.3.3.1 Elaboration of Justification

A first and fundamental dimension of argumentation is the degree of elaboration of justification. The focus here is on the length of the causal chain when arguing for a particularly dominant variable within a knowledge structure.

This category, however strictly quantitative in a first step, reaches out to several other categories and possible distinctions of logic. A causal chain based on authority or intuition will be comparatively shorter than a highly rationalized justification. In other words, it seems plausible to claim that the more rationalized or analytical an argumentation, the more elements in the causal chains and, therefore, the longer the causal chain. Therefore, I see a connection to the differentiations of substantive reasoning or reasoning based on rationality versus reasoning based on intuition or emotion (e.g. Stevenson, 1944).
Second, the length of causal chain also alludes to the differentiation referred to by Tell (2004) between justification by *procedure* versus justification by *performance*. While justification by procedure is guided by *inference*, justification by performance is guided by *influence*. In other words, the underlying principle of justification by procedure is reason or rationality, whereas the principle that governs justification by performance may be irrationality or intuition. One may assume that more intuitive reasoning leads to shorter chains of reasoning, whereas more analytical reasoning leads to longer argumentative chains.

Third, to some extent this differentiation reflects the *degree of explicitness* of justification. This refers to a very prominent conceptualization of knowledge creation in strategic management literature, i.e. the distinction of implicit and explicit knowledge and their conversion as a process of knowledge creation (Polanyi, 1966; Nonaka, 1994; Von Krogh and Nonaka, 2000).

As the elaboration of justification reflects to some degree the above mentioned three other dimensions of justification, it is particularly appealing to analyze the elaboration of argumentative chains. Second, given the quantitative nature of elaboration of justification, it is appropriate to start an analysis of argumentation. For complementary insights, I would like to draw on more content-related types of justification.

### 2.3.3.2 Internal versus External Justification

The understanding of the differentiation of internal and external justification underlying this study is that the categories distinguish whether the justification is seen as within the entity or external to the entity. The entity in the context of this study is the firm. Therefore, one could claim that external justification applies to justification by the marketplace, industry recipe, and general knowledge. In contrast, internal justification refers to the justification on basis of knowledge within the firm. However,

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19 This differentiation is related to a distinction between logic of consequences (justification by procedure) and logic of appropriateness (justification by performance) (March, 1994 cited in: Tell, 2004).
this categorization will vary according to the subjective attitudes and characteristics of
the firms (e.g. self-confidence of the managers) and the interaction patterns of the firm
with its environment, for instance the firm shaping the industry recipe.

Since this conceptualization differs from other conceptions on the difference between
internal and external justification, I would like to draw the reader’s attention to the
philosophical notion by Bonjour, the theory in jurisprudence by Alexy, and the
hypothesis of attribution theory in social psychology by Wagner and Goodin.

According to Bonjour, internal justification refers to coherence theory, whereas
external justification refers to fundamentalist theories of knowledge creation.
Therefore, internal justification is based on no basic empirical beliefs and no
foundation of empirical knowledge. External justification, by contrast, assumes that
the non-inferential foundations are independent of the knowing subject. Hence, some
things are given. Bonjour’s differentiation is used by Tell (2004), who argues for its
application to a managerial knowledge creation. Like Bonjour, Alexy applies the
differentiation of internal and external justification to the context of jurisprudence:
whereas internal justification is seen as relative to the rationality of the premises,
external justification is the reasoning of the premises.

When Wagner and Goodin among others in the field of social psychology speak of
attribution bias or self-serving bias (Wagner and Goodin, 1997, 276), the authors refer
to a phenomenon which relates somehow to the above distinction, although it differs
essentially in its purpose and therefore in its focus. To put it simply, attribution theory
focuses on instances in which individuals falsely attribute causes to internal or
external circumstances. Specifically, external or situational attribution assigns
causality to an outside factor; internal or dispositional attribution assigns causality to
factors within the person. In many occasions, studies in the field of management draw
on this differentiation based on attribution theory. The reasoning in these studies is
similar, “managers will attribute positive outcomes (successes) of their own
organizations to internal, organizational strengths and negative outcomes (failures) of
their own organization to external, environmental factors” (Wagner and Goodin, 1997, 276). Therefore, many authors conclude, “the more managers make external attributions for poor performance outcomes, the lower the likelihood of strategic reorientation” (Lant et al., 1992, 590)” In addition, Barr et al. (1992) refer to the distinction and the same causality as the latter authors when explaining the survival of two major Railroad companies.

Despite the epistemological challenges, this research clearly relies on Bonjour’s theory between internal and external justification. Grounded in an objectivist paradigm, attribution theory claims to categorize objectively and then judges the correctness of the firm’s associations. However, a descriptive approach to argumentation theory as brought forth by Toulmin deliberately does not judge on the correctness of association as realized by the firm. An example illustrating the potential of abstaining from objectivist differentiations of internal and external justification is the transgression of boundaries: firms also shape their industry. Therefore, a significant factor impacting the firms, the industry, may be not stated since it is shaped by the firm itself. This leads me to a major implication of this distinction for this study. I distinguish the extent to which firms rely on the industry recipe instead of their idiosyncratic recipe.

2.3.3.3 Temporality of Justification versus Generality of Justification

Oftentimes justification of arguments is not atemporal. Therefore, several of the categories that Toulmin suggests for the categorization of arguments are related to time or temporality; notably, he proposes to analyze arguments with reference to past, present, or future. In my view, this categorization has two major drawbacks. First,

20 Toulmin (1958) suggested the following categories:
  1) Past
  2) Present
  3) Predictions
  4) Moral judgements
present tense is hard to distinguish from the ongoing past and from when the future has started, which resonates with the view that there is no present (e.g. Fromm, 1976). Second, there may be statements that refer to the past, present, and future. Hence, these arguments would have to be classified into more than one category.

In order to tackle this conflict, I introduce two categories: one that refers to temporality and one that refers to generality. If a statement is valid at all times it falls into generality. If a statement refers to something that started in the past and that is continuing today I classify it “past” within the category of temporality. This is to be distinguished from justification referring to the future including all actions that will be started in the future. In sum, the distinction into justification by temporality (past and future) and generality allows me to link other dimensions of justification. It connects, for instance, with a discourse of continuity versus a discourse of discontinuity and is related to path dependence and path breaking (e.g. Garud and Rappa, 1994). Furthermore, those distinctions relate to other distinctions, i.e. to the differentiation between empirical and theoretical, which respectively is related to the differentiation of inductive and deductive and also the differentiation between general and specific. Finally, this classification also alludes to retrospective and prospective implied in the differentiation between cognitive and experiential (Gavetti and Levinthal, 2000).

In conclusion, the above exposed dimensions of justification reveal additional patterns of the evolution of coherence or the dominance of logic. In the following, I refer to the relation of the evolution of dominant logic and strategic inertia.

2.4 Relation between Evolution of Dominant Logic and Strategic Inertia

The nature of dominant logic is ambiguous. Researchers perceive the construct as enabling or limiting for the firm’s strategic action reflected by metaphors, i.e. the
The objective of this research consists in gaining new insights on the above questions by revealing patterns of the evolution of dominant logic and contrasting them with the respective firm’s strategic change potential or in other words, strategic inertia. In order to clarify the assumptions of my endeavor, I illustrate my understanding of the dependent variable, strategic inertia.

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22 Emphasis added by the author.
2.4.1 Definition of Strategic Inertia

In physics, researchers define inertia as “the resistance an object has to change its state of motion.” The state of motion of an object is its velocity–speed with direction. Thus, inertia is a tendency of an object to resist change in its velocity.

Huff et al. (1992) see inertia in the context of strategic management as “tendency to remain with the status quo and the resistance to strategic renewal outside the frame of strategy.” Hodgkinson and Wright (2002) understand inertia as “habitual reliance on a (previously successful) organizational recipe or success formula.” In addition, Gresov, Haveman, and Oliva, (1993) define inertia as “tendency not to move or act.”

Common to the above definitions is the reference to status quo or reference to path dependence, which results in a belated, insufficiently radical action or no action at all. Inertia is seen in relation to the external forces, but also to the firm’s own development.

Inertia was introduced as “structural inertia” (Hannan and Freeman, 1977/84) in the context of population ecology: “Structures of organizations have high inertia when the speed of reorganization (core feature change) is much lower than the rate at which environmental conditions change” (Hannan and Freeman, 1984).

Over time, authors have discussed several other types of inertia:
1) Structural inertia (Hannan and Freeman, 1977/84)
2) Organizational inertia (Buchta, Meyer, Pfister, Mild, and Traudes, 2003; Kelly and Amburgey, 1991)
3) Competitive inertia (Miller and Chen, 1994)
4) Resource rigidity–routine rigidity (Gilbert, 2005)
5) Strategic inertia (Huff et al., 1992; Hodgkinson and Wright, 2002)
6) Cognitive inertia (e.g. Barr et al., 1992; Hodgkinson, 1997/2000; Reger et al., 1994) versus Action inertia (Gavetti, 1997)

7) Activity inertia (Sull, 1999 cited in: Gilbert, 2005, 757)

8) Technological inertia (Tripsas and Gavetti, 2000)

In this research, I would like to concentrate on ‘strategic inertia’. While there are, of course, overlaps with the above-mentioned types of inertia, there are differentiating criteria for my conceptualization of strategic inertia.

Strategic inertia applies to strategic actions rather than tactical ones. First, I consider strategic actions most appropriate for the understanding of dominant logic since the logic of the dominant coalition within the firms. Therefore, the notion is associated with strategic actions rather than other organizational actions. Second, strategic actions have primary relevance for long-term firm success. Third, strategic actions are easily detectable, which is particularly important concerning the fact that the nature of this study is comparative. Strategic actions are merger and acquisitions, strategic alliances, and important new products and services. In other words, strategic actions involve a larger expenditure of resources, a longer time horizon, and a greater departure from the status quo than do tactical actions (Dutton and Duncan, 1987 cited in: Miller and Chen, 1984, 2). This understanding of strategic inertia encompasses the core structure (goals, forms of authority, core technology, and marketing structure) and peripheral features (horizontal and market extension mergers, joint ventures, and interlocking directorates) of the firm (Hannan and Freeman, 1984; Amburgey and Kelly, 1993).

Initially, authors in management saw inertia as a danger. Later research, however, paid more attention to the potential benefit of inertia (Nelson and Winter, 1982; Hannan and Freeman, 1984; Amburgey and Miner, 1992). The benefits of inertia include greater reliability in delivering a sound product and many economies of efficiency and routine (Miller and Friesen, 1980). However, a particular appeal of the notion of
inertia lies in its possession of both positive and negative effects. Therefore, this study investigates both positive and negative effects of inertia.

According to Hannan and Freeman (1977/84) a firm can be inertial, even when it is making changes, if these changes are along the line of the firm history. Therefore, one can evaluate inertia in relation with the external environment and see it as a change or deviation from the focal firm’s internal history. For reasons of comparability, the evaluation of strategic inertia in this study will rely on the second approach for evaluation.

As alluded to when presenting the different definitions of inertia, the concept can apply to various specific fields. Rather then being tailored toward a specific field such as politics (e.g. Lant et al., 1992) or competition (e.g. Miller and Chen, 1994), this study’s conceptualization of inertia applies to various dimensions of strategic action. The main reason for this rather broad scope for inertia is that the nature of dominant logic— independent whether one relies on the traditional definition or the working definition of this study ‘strategic arguments that are more coherent than others—does not apply to particular fields, rather to a range of strategic moves.

2.4.2 Strategic Inertia: Antecedents and Moderating Variables

The first and foremost factor influencing inertia is firm age (Hannan and Freeman, 1984). The original authors assert that inertia will grow over time (Hannan and Freeman, 1984; Tushman and Romanelli, 1985; Schwenk and Tang, 1989). Therefore, with increasing firm age, inertia is estimated to be greater.

For the particular context of cognitive maps, the explanation of Kieser and Sproull (1982) captures and applies this effect of age to a cognitive context. The authors argue that cognitive representations are typically based on historical experience as opposed to current knowledge of the environment (Kieser and Sproull, 1982). Therefore, it
seems reasonable to assume, if the history of the firm is longer (with higher age) the probability of having outdated knowledge in the dominant logic is greater. This outdated knowledge will lead to greater inertia.

Based on the correlation between firm age and firm size (Hannan and Freeman, 1977/84, Miller and Chen, 1994, Ranger-Moore, 1997), frequently size is also attributed to inertia. Tushman and Romanelli (1985, Proposition 3 cited in: Huff et al., 1992) more explicitly argue that increase in size leads to increased complexity, increased convergence, and thus, increased inertia. Lant et al. (1992), link these assumptions to firm success arguing: “Large firms tend to be successful. Good performance tends to accumulate in the organization as slack (Cyert and March, 1963), and the organization will grow larger with repeated success. Since success reduces the probability of change in a target-oriented organization (Cyert and March, 1963), large organizations will be less likely to change” (Lant et al., 1992, 52).

Whether dependent on size or not, it remains clear that past success (Starbuck and Milliken, 1988; Miller and Friesen, 1984; Miller and Chen, 1994, Gresov, Haveman and Oliva, 1993; Audia, Locke, and Smith, 2000) and past investments in resources (Hannan and Freeman, 1984, 1989) impact strategic inertia.

Success of firms, however, is dependent upon environmental change (Lant and Mezias, 1992, 50). A core prediction of learning models and a central argument of the punctuated equilibria model (Romanelli and Tushman, 1985) is that a fundamental restructuring of environments should increase the likelihood of significant organizational change. The authors claim, for instance, that organizational change will increase following environmental change and will decrease during environmental stability (Lant and Mezias, 1992).

Of course, strategic inertia is also impacted by the characteristics of the management team, the leadership style (e.g. autocratic leadership, Fairhurst, Green, and Courtright, 1995) and the dynamics of the management and board—notably, the degree of consensus within boards (Dess and Priem, 1995, Floyd, and Wooldridge, 1992), stable
and continuous membership (Romanelli and Tushman, 1985), and homogeneity of beliefs (Abrahamson and Fombrun, 1994).

In sum, a variety of factors relate to strategic inertia. Therefore, a study on strategic inertia or related to strategic inertia will have to consider these factors. Nevertheless, firm age is most frequently associated with strategic inertia, so I focused on age when sampling and analyzing the firms. In the following, I detail the methodological issues of this study.

2.4.3 Dominant Logic and Inertia: Delineation of the Concepts

Considering the above definition of inertia and a frequently stated definition of dominant logic as the “way in which managers conceptualize the business and make critical resource allocation decisions—be it in technologies, product development, distribution, advertisement or in human resource management” (Bettis and Prahalad, 1986, 490), one may think that the two constructs are very similar or even tautological.

According to Bettis and Prahalad (1995) dominant logic is related to environmental-driven organizational change. Dominant logic functions as an ‘information filter’ or ‘funnel’ (p.7) limiting the organizational attention and resulting in what we may call strategic inertia. Through this filtering function, a relationship with strategic inertia is inherent in the construct of dominant logic.

In order to tackle this potential tautology, this research is particularly clear on the understanding and operationalization of the two constructs. Bettis (2000) stated, “We felt that [dominant logic] was grounded more in cognitive psychology than any other established academic discipline” (p. 168). Therefore, I conceptualize dominant logic as predominantly cognitive. The working definition of dominant logic as “strategic arguments that are more coherent than others” clearly reflects this understanding. Specifically, I focus on the reflection of strategic actions as reasoned by the CEOs of the firms studied in the research.
As shown above, inertia, in contrast to dominant logic, refers to action and cognition. The notion of cognitive inertia comes even closer to the notion of dominant logic. Hodgkinson (1997) defines cognitive inertia in the following way:

“Once established, there is a danger that actors may become overly dependent on their mental models of competitive space, to the extent that they fail to notice changes in the material conditions of their business environment, until these changes have become so widespread, or significant in other ways, that their organization’s capacity for successful adaptation has been seriously undermined” (Hodgkinson, 1997, 921).

Indeed, the concept of cognitive inertia is closely related to dominant logic. This research, however, focuses on strategic inertia rather than cognitive inertia. I see strategic inertia strictly as a function of past changes in actual strategic actions. Concretely, I compute change scores of past strategic actions in order to predict potential for future strategic actions. Past strategic actions refer to various areas: marketing, personnel, financial structure, organizational structure, external institutions, project or service-related activities, and technological innovation. I analyze the strategic actions that each respective firm in my sample realized in the marketplace along these dimensions.

In sum, this research sees dominant logic as predominantly cognitive. Furthermore, I investigate strategic inertia rather than other forms of inertia as illustrated above. This assures that this empirical study is less subject to a potential tautology of the concepts that could arise if one studied the relationship between cognitive inertia and dominant logic with a focus on cognition, or action inertia with an action-based understanding of dominant logic.
3 Methodology

In this chapter, I explain how I investigate the topic and provide a rationale for my methodological choices. More precisely, I expose the research design, methodology, empirical setting and selection of cases, of this study. In addition, I point out the core of my research process. I end this discussion by referring to the quality measures, i.e. validity and reliability.

3.1 Research Design: Comparative Case Study

Given that the question of this research is a ‘how-question’, i.e. “How does dominant logic evolve?”, case study research is particularly appropriate (Yin, 1994, 4). A case study is “[...] an empirical inquiry that investigated a contemporary phenomenon within its real-life context, especially, when the boundaries between phenomenon and context are not clearly evident” (Yin, 1996, 13). More precisely, the design of this research is an inductive case study. Since the literature review shows that there are different understandings of evolution and that there is no answer for how evolutionary patterns of cognitive structure relate to inertia, an inductive design is appropriate (Eisenhardt, 2007, 26). I entered the field with a hypothesis in mind, namely that organizational age is related to cognitive rigidity and hence strategic inertia. In line with Siggelkow (2007), I consider this procedure not only useful but also inevitable.23

The case study method thereby aims at retaining the meaningful character of studied phenomena for generating constructs and variables and for stipulating causal links (Eisenhardt, 1989a/2007; Yin, 1994). The foremost criterion in favor of case study methodology is the likelihood of building new theory. The juxtaposition of contradictory or paradoxical evidence brings about creative insights (Quinn and Camerun, 1988). The repeated verification and juxtaposition of results leads to a solid

23 Siggelkow (2007, 21): “In my view, an open mind is good; an empty is not. It is true that one wants to retain the capacity to be surprised, but it seems useful (and inevitable) that our observations be guided and influenced by some initial hunches and frames of reference.”
observation and are very likely to bring about testable constructs. Finally, the theory is empirically valid because we can sense things: “How they feel, smell, seem” (Mintzberg, 1979 cited in: Eisenhardt, 1989a, 547).

More precisely, this research is a comparative case study because this design counterbalances the generalizability of the results with the contextualist’s desire for descriptive understanding (Pettigrew, 1985, 242). I base my analysis on six cases, fulfilling Eisenhardt’s suggestion of a minimum of four cases24 (Eisenhardt, 1989a, 545). While relying on a rigid comparison of these six cases, I explore various dimensions of the single case - otherwise unrecognized by the researcher - that can then be classified and can promise robust results. Replication logic (Eisenhardt, 1989a) as opposed to sampling logic (Yin, 1994) is the underlying logic of this research. More precisely, this research is based on comparative case study by a theoretical replication as I expect the results, namely the impact of dominant logic on strategic inertia, to be different in the cases analyzed for predictable reasons.

Particular to the present comparative case study is its longitudinal character (20 months) and its grounding in real-time data collection. Several authors (e.g. Laukkanen, 1994) suggest this type of research for cognitive issues in general and for dominant logic in particular (Von Krogh and Grand, 2000).

3.2 Method: Cognitive Mapping

“The world of reason is poor compared to the world of senses - until or, but, because, when, if, and unless populate it with endless possibilities” (Kaufman, 342 cited in: Weick, 1979).

The main methodology I use for gaining insights into my research question is the cognitive mapping technique. In addition, I use document analysis and linguistic analysis. As the cognitive mapping technique is central to this research, I explain in

24 “With fewer than four cases, it is often difficult to generate theory with much complexity, and its empirical grounding is likely to be unconvincing” (Eisenhardt, 1989, 545).
more detail the assumptions of this methodology and present my stance in the discussion.

### 3.2.1 Cognitive Mapping Technique

Since dominant logic is stored as a “cognitive map (or set of schemas) among the dominant coalition” (Prahalad and Bettis, 1986, 491), I consider the cognitive mapping technique (Eden and Spender, 1998; Huff, 1990; Fiol and Huff, 1992; Walsh, 1995; Eden, 1992) an appropriate way for collecting and analyzing data.

For the purpose of this research, I define cognitive mapping in line with Cossette:

“A cognitive map is a graphical representation of the researcher’s mental representation of a set of discursive representations expressed by a subject based on his or her own cognitive representations with regard to a specific object” (Cossette and Audet, 1994, 5 cited in: Cossette, 2000).

Hence, I perceive cognitive maps as a promising analytical method for capturing causal relations for a defined problem space. This understanding is in line with the current comprehension of the researchers engaged in cognitive mapping in management studies. Eden, for instance, claims, “The only reasonable claim that can be made of cognitive maps as an artefact […] they may represent subjective data more meaningfully than other models” (Eden, 1992, 262). Similarly, Eden et al. (1979) state: “They [cognitive maps] facilitate the discussion of cognitive processes that can never be directly observed.” Moreover, Huff consider cognitive maps “an especially strong vehicle for moving between theory and practice” (Huff, 2002, 2).

When introducing Tolman’s (1948) notion of ‘cognitive mapping’ into management literature, Axelrod defined it as a method for studying social actors’ cognitions with

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25 Tolman (1948) originally coined the notion of the cognitive map with the intent of developing an alternative to the stimulus-response model by Neisser, who intended to explain orientation behavior by assuming that the brain memorizes local and causal experience in the form of a map (Tolman, 1948, 192).
the intention of revealing a person’s stated values and causal beliefs in order to analyze and better understand the decision-making of influential actors (Axelrod, 1976 cited in: Walker, 2004, 68). More precisely, Axelrod argues that the objective of cognitive mapping is to uncover underlying beliefs or assumptions concerning causal relationships, to encounter explanations for past behavior, to comprehend actual interpretations and to make predictions for future action. Simply stated, every map reveals concepts and relationships (or causal beliefs) among concepts (Axelrod, 1976), with concepts being units of meaning (Bougon, 1983) and residing in the minds of the participants.

Frequently used for the analysis of competitive positioning as perceived by managers (Thomas and Porac, 1990; Reger, 1990), one of the major advantages of cognitive mapping is “that it encourages holistic synthesis rather than reductive analysis of the actor’s view of the world” (Huff, Narapareddy, and Fletcher, 1990, 403-404).

### 3.2.2 Causal Mapping as Specific Type of Cognitive Mapping

Among the various methods of cognitive mapping (e.g. Eden and Spender, 1998; Huff, 1990; Fiol and Huff, 1992; Walsh, 1995; Huff and Eden, 1992; Carly and Palmquist, 1992), the most appropriate for the purpose of this research is causal mapping, which is “a form of cognitive map that incorporates concepts tied together by causality relations” (Weick and Bougon, 1986, 106). For eliciting concepts within a causal map, I adhere to the principles of Axelrod, the pioneer of causal mapping: “But whatever concept is represented, it is always regarded as variable that can take on more than one value” (Axelrod, 1976, 59).

I adopt this particular approach to cognitive mapping for various reasons: first, it represents and operationalizes the concept of causality contained in logic in general and in dominant logic in particular. Second, this type of mapping is recognized for its integrity, internal consistency and stability of the actor’s map over time (Huff, 1990). Third, causal mapping is not only the original form of cognitive mapping (Axelrod,
51

1976, 10), but causality is also an epistemological primitive in organizational research (Weick and Bougon, 1986 in: Sims and Gioia, 1986). Fourth, causal mapping is one approach in cognitive mapping that is, *a priori*, suitable for the purposes of debiasing actors’ judgements of risky problems under uncertainty (Hodgkinson, Brown, Maule, Glaister, and Pearman, 1999). Fifth, while being reductionist, cognitive mapping (Huff, 1990) enables me to capture properties of a complexity of cognition through a pragmatist whole. Sixth, the maps allow eliciting the externalizable part of the tacit knowledge. Finally, causal maps are useful in eliciting logic because they can represent multiple explanations and consequences, show interrelationships between factors, and potential dilemmas (Eden and Ackermann, 1998).

3.2.3 Enhancing the Validity of Cognitive Mapping

As explained above, the cognitive mapping technique is an adequate elicitation method for a comparison of the evolution of dominant logic. Nevertheless, this methodology has potential drawbacks. A frequently mentioned criticism to cognitive mapping is that maps can only represent the ‘espoused theory’ and not externalize ‘theories in use’ (Argyris and Schon, 1974) given that one cannot reveal the interviewees’ implicit theories by simply asking. I address the ‘phronetic gap’

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26 “The cognitive mapping approach uses only one basic type of relationship, namely the causal relationship” (Axelord, 1976, 10).

27 “Causality is an epistemological primitive. There are only four possible things that can happen among events in an organization. The event can be either similar or different, and they can occur either at the same or different times. That is it. These four combinations are the primitives of all organizing. This chapter is about the most relevant combinations in organization theory: the combination of different events at different times. It is the combination that generates the inferences of causality that are stored in the sets of related causality beliefs we call cause maps” (Weick and Bougon, 1986 in: Sims and Gioia, 1986).

28 “Given the properties of the parts and the laws of interaction, it is not a trivial matter to infer the properties of the whole […in the face of complexity, an in-principle reductionist may be at the same time a pragmatist whole” (Simon, 1981 cited in: Eden et al., 1992).

between the formula and its enactment (Taylor, 1993, 57 cited in: Tsoukas, 1996, 20) in my research in several ways. First, I consider a cognitive map “a graphic representation of a set of discursive representations made by a subject with regards to an object in the context of a particular interaction” (Cossette and Audet, 1992, 327). Second, I incite the participants to articulate their knowledge by returning frequently to the research site and asking controversial questions based on their own prior statements and the ones made by their colleagues.

A second disadvantage critics associate with cognitive maps is that one cannot represent the dynamic nature of organizations in an appropriate manner (Huff, 1990). This critique is not entirely tenable given that “maps which portray causality, predicate logic, or sequences, all capture temporal relations: if this (in the now), then that (in the future)” (Weick in: Huff, 1990, 1). Nevertheless, this research differs from other studies that use the cognitive mapping technique in strategic management (e.g. Fahey and Narayanan, 1989; Barr et al., 1992) for collecting data in real time settings. Moreover, I enrich my argumentation based on the analysis of the carefully developed cognitive maps by referring to the chronological analysis of key events in firm’s history, which I develop on basis of conjoint document analysis. Sensitive linguistic analysis enables me to draw on the standpoint of interviewee and the intrusion of the causal relationship when referring to linguistic indicators. In sum, I render the dynamics contained in the maps more explicit by referring to historic events based on document analysis and linguistic analysis.

Having said this, I come to a related critical issue of cognitive mapping: missing information about the causal linkages. According to Huff (1990), there is no possibility for speculative or experimentally fitted relations: relations that are based on belief and environmental conditioning. However, this information is not relevant due to the epistemological stance I take in my research: rather than comparing my results with the ‘real world’ as validation, this research focuses exclusively on the internal coherence of the cognitive maps.
A last criticism of the cognitive mapping technique is *researcher bias*. Since I chose to draw the maps myself, I face this bias. If the interviewee were to draw the map himself/herself, the bias would be greater because of the variance in capability of each interviewee to understand, learn and implement the specific cognitive mapping technique. In order to reduce researcher bias, I diligently follow recognized procedures for cognitive mapping and report each step of my procedure. The ultimate objective of this research being the comparison across companies, the researcher bias is consistent, which is preferable to a bias that is applicable in different intensity to the respective maps.

### 3.3 Measures

Here, I refer to the measures I use when investigating the theoretical building blocks: dominant logic, evolution of dominant logic, and strategic inertia. While in the discussion of dominant logic, I concentrate on the static measurement of dominant logic; in the discussion of evolution, I focus on how to measure the shifts in dominance of logic. Finally, I present the measures for strategic inertia. This latter variable differs from dominant logic and the patterns describing its evolution in two ways. First, the two measures differ in the content that is measured. While dominant logic is the conceptualization of strategy, strategic inertia shows the differences in realized strategies among the firms contained in this study’s sample. Second, the variables differ in the underlying paradigm: while dominant logic in this study is a subjective measure, strategic action is objective. Therefore, the variables are clearly very different in *what* they measure and *how* they measure it.

#### 3.3.1 Dominant Logic

This research defines dominant logic as “strategic arguments that are more coherent than others.” As outlined in the theory part, I understand by ‘coherence’ that the different parts or elements *cohere* or ‘hang together’. When talking about building
blocks, I identified the concept of coherence as having several characteristics (Bonjour, 1985).

Although I draw on these commonly accepted measures of cognitive mapping (centrality analysis, domain analysis, and cluster analysis) for my study, the purpose of using these measures varies from other studies. While studies that I encountered used cognitive mapping technique to describe the maps, I use the measures to identify the dominant concepts within the cognitive maps. Therefore, I use the measures of cognitive maps for a very specific purpose that is at the core of this study. As I define dominant logic in this study as “strategic arguments overarching others by coherence,” the measures enable me to measure the coherence, and, therefore, the degree to which some arguments are more dominant than others. In the following, I explain the three measures indicating coherence of dominant logic in cognitive maps: centrality, domain, and cluster.

(1) **Centrality: Relative importance of concepts (CENT)**

Centrality (Carley and Palmquist, 1992; Eden et al., 1992; Freeman, 1979; Knoke and Kuklinski, 1982) is computed by adding the total number of concepts to which a specific concept is linked to, either directly or indirectly. In other words, centrality is the sum of the difference between the centrality of the most central concept and the centrality of all other concepts in the map scaled by the total number of possible links between the concepts in the map (Freeman, 1979; Knoke and Kuklinski, 1982). Centrality analysis is particularly promising for the purpose of this study since it helps me to identify the relative importance of a concept by taking into account indirect links.

While Bougon, Weick, and Brinkhorst, (1977) analyzed direct links systematically in an ‘adjacency matrix’ and indirect links in a ‘reachability matrix’, I do not use this method as I think this influences exceedingly the subjective reasoning of the interviewee by suggesting dimensions that the person may not have thought of and, therefore, may not be central to the interviewee’s thinking patterns.
(2) Domain: Importance of Explications and Consequences (DOMAIN)

Domain analysis counts the number of linkages, including explications and consequences. The total number of these linkages is attributed to each concept. This analysis is particularly valuable for identifying the most prominent explications and consequences used by the interviewee. In addition, this analysis helps me to identify whether the interviewee sees certain variables mainly as explications or as consequences. Of course, concepts can be most important in terms of explication and consequence.30

(3) Cluster: Structural Analysis (CLUSTER)

Cluster analysis is used to elicitate the structuring of the interviewee’s thoughts. More precisely, cluster analysis (Eden et al., 1992) provides the information concerning to which degree does the individual simplify reality by creating different groups. Typically, a map contains relatively separable clusters (Eden, Ackermann, and Cropper, 1992).

Cluster analysis is the analysis of the concepts, which are relatively isolated, where the number of links among the group is minimal. Hereby, only direct links within the group are taken into account. In addition, cluster analysis enables me to determine to which degree the interviewee simplifies his/her reality by creating different groups (Eden et al., 1992).

To conclude, these three measures help me to identify the dominant logic within the cognitive map, which represents the conceptualization of the strategy by the dominant coalition.

30 Cossette, for instance, identified, “systematic or deliberate soldlering” as a major explication and a major consequence when analyzing cognitive maps he had developed on Taylor’s thinking on the Principles of Scientific Management (Cossette, 2002).
3.3.2 Evolution of Coherence

The above explained measures form a basis for the operationalization of measure for the evolution of coherence and (the evolution of) justification patterns.

As the most fundamental, simple, and straightforward measures among the three proposed measures of cognitive maps, I use the domain value for identifying the most important concepts of the maps over time. Then, I use the remaining two measures, i.e. centrality and cluster in order to increase the explanatory potential and give a well-rounded picture of the cognitive map.

For determining the elaboration of the patterns of justification, I refer to the centrality value. This value is particularly apt for this purpose since it captures the length of causal chains, which corresponds to my understanding of elaboration of justification patterns. In other words, the centrality value together with the analysis of the actual chain of reasoning helps me to identify and characterize the justification patterns.

To conclude, the interplay of the three measures, domain, centrality, and cluster enable me to show the evolution of dominant logic and the underlying justification patterns.

3.3.3 Strategic Inertia

In the theory part, I defined strategic inertia in line with Huff et al. (1992) as the “tendency to remain with the status quo and the resistance to strategic renewal outside the frame of strategy” (Huff et al., 1992). Moreover, I referred to inertia as “habitual reliance on a (previously successful) organizational recipe or success formula” (Hodgkinson and Wright, 2002). For the purpose of operationalization, I understand strategic inertia in line with Gresov et al. (1993) as the inverse of an instantaneous rate of change between alternative levels of competitive response. More specifically, I operationalize strategic inertia as the deviation from previous strategic positioning at the firm level.
When searching for dimensions of inertia along which to measure this deviation from previous strategic positioning at the firm and then to compare it across companies, Manimala (1992) inspired me. The latter author performed a study on high pioneering-innovative ventures and low pioneering-innovative ventures, which he analyzed along seven dimensions:

- Marketing
- Personnel
- Financial Structure
- Organizational structure
- External Institutions
- Project/Service
- Technological Innovation

I selected the above-mentioned dimensions for operationalization of strategic inertia for mainly two reasons. First, they capture a wide variety of firm activities, which is necessary to my understanding for the context of entrepreneurial firms. While performing slight changes, I could apply these measures to the software industry. Moreover, I also included turnover and profit because these two measures provide further indication of inertia given that inertia is associated with deteriorating performance (e.g. Kelly and Amburguey, 1991). Second, all dimensions of inertia are relative measures in a scale of 1 to 7 (1 indicating no change and 7 indicating radical change), guaranteeing comparability among the cases. Based on these dimensions, I capture the change for the entire period of observation from mid 2004 to beginning of 2006.

Although I gather the information for the measures from multiple sources, information about strategic actions from the CEO builds the basis for this measure. Further research helps me to verify the CEO’s utterances and establish a complete list of strategic actions the firms performed. Subsequently, I evaluate the strategic actions
enumerated and reasons given for the amplitude of change and compare the measures across firms in order to minimize subjective perception. While I pursue capturing subjective perceptions when developing the cognitive maps over time, I minimize perceptual bias when evaluating and comparing strategic inertia across the firms. This results in measure of relative change. This deviation of the firms’ previous strategic actions appears to be the most appropriate in this context given heterogeneity among firms: although all firms are in the software industry, they vary concerning other aspects of their business and their organization.

The fact that this measure encompasses path dependence further justifies its aptitude. In other words, the path-dependence effects would have been exceedingly disturbed when anchored in anything else than the firm itself. For instance, a measure of the change in strategic action against the change of the competitors would not be satisfactory in the context of this study. First, the field of competitors for certain firms contained in the sample is very heterogeneous (e.g. SAP versus medium-sized suppliers of applicants software) Second, some firms simply changed their reference group of competitors over the observation period. While Alpha-Tech’s competitors, for instance, are similar medium-sized firms, the firm sees professional service firms (e.g. Accenture) and IT corporations (e.g. IBM) as its competitors at the end of the period of observation. Similar changes apply for other firms in the sample. Third, the field of competitors is very diverse given that the firms may specialize in a niche, e.g. library systems (Delta-Tech) or position themselves on a very general level, e.g. being an internet service provider (Gamma-Tech). Therefore, this procedure would not have led to comparability, which is the intention of a measurement of strategic inertia or change in the context of this comparative case study. Since such a measure would have been inaccurate and unreliable, this study relies on the change of the firm from its status quo as stated in the definition by Huff et al. (1992).

In sum, I base the measure of strategic inertia on seven dimensions capturing the breadth of the business orientation of the software ventures in their early years.
3.4 Empirical Setting and Selection of Cases

Here, I outline the empirical setting for my study and the cases I selected. I explain why and how I select this study’s sample from a population of German-speaking software firms. Second, I discuss the sampling method. Finally, I consider potential contextual influences.

3.4.1 Industry Focus: Software Industry

The selection of cases follows Eisenhardt’s recommendation to consider, first, a specified population to constrain extraneous variation and sharpen comprehension (Eisenhardt, 1989). The population of firms that I use in this research are new and adolescent software ventures from three to twenty years old.

Given that several authors have recommended studying dominant logic in changing environments (Von Krogh and Grand, 2000; O’Brien and Slack, 2003; Zietsma et al., 2002), I chose the software industry for its dynamic nature. Prahalad and Bettis also suggest: “[…] the process of changing dominant logics is important to any firm that encounters rapid change in the structure of the industries in which it competes (Prahalad and Bettis, 1986, 497).”

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31 Emphasis added by the author.
The Software Industry within the Information Technology Industry is interesting for several reasons: first, the burst of the internet bubble (European Information Technology Observatory, 2004) and the economic downturn 2001/02 (OECD report, 2002/03) hit very hard as the evaluation in this sector in the stock market and the projects done in this field were incomparably well paid. This, of course, led to major change in this industry. On the other hand, many potential openings for change through merging with other industries such as the telecommunication industry arose. This potential for horizontal diversification creates intense competition along the value chain. Second, the software industry reaches maturity over the observation period: professionalization, standardization, and industrialization become very relevant in this industry.

A further criterion in favor of the software industry is that this industry is characterized by little regulation by authorities, few standards and no patents (Liebeskind, 1996). An important threat to incumbent organizations is the creation of an organization designed specifically to take advantage of some new set of opportunities. When the cost of building an organization is low and the expected time from initiation to full production is short, this kind of threat is intense unless there are legal barriers to the entry of new organizations (Hannan and Freeman, 1989). Hence,
there is bias by ‘artificially’ regulated actions. The software industry, an industry with relatively few regulations, offers a great array of opportunities for venturing activities.

Due to this change in ‘industry recipes’ (Spender, 1989), the strategist is forced to make a personal judgement about the relevance of the recipe to his firm’s situation and is encouraged to (re)act. As the Information Technology Industry is a large field, I define more accurately the type of ventures that I consider for my research. I focus on firms that engage in software development, irrelevant of what the portion of their business this activity takes. There are mainly three areas in which these firms are active: technology development, consulting, and design. The ventures develop their own software products or make changes to existing software products (e.g. ERP software products). In this study’s sample, I include ventures that are active in customized software projects, on software products, or on modular constructs. The rationale for this broader focus on the activity is that exactly the changes in activity and the simultaneous change in reasoning or changes in dominant logic are relevant here.

3.4.2 Sampling Method and Criteria

The sampling method is theoretical replication, i.e. the results diverge for predictable reasons (Yin, 1994). Pettigrew argues for selecting cases of extreme and polar types in which the processes of interest are transparently observable (Pettigrew, 1988). I provide the ground for cross-case comparison by homogeneity of cases. For the selection of the cases of the German-speaking software industry, I refer back to the research question and the two sub-questions:

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<th>How does the evolution of dominant logic relate to variety in strategic action?</th>
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<tr>
<td>1) How does dominant logic evolve?</td>
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<td>2) How do the evolutionary patterns of dominant logic relate to strategic action?</td>
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Since I was, at the time of sampling, little knowledgeable about the central contextual factors affecting the emergence of a dominant logic, I made a single theoretically founded assumption based on the age of the software venture. Taking for granted that ‘cognitive rigidities’ (Von Krogh and Roos, 1996) augments with time, I group the ventures in three groups (please see figure 4-2), namely, Group A (ventures founded in the 80s), Group B (ventures founded in the 90s), Group C (ventures founded from 2000 onwards). As the ventures in each group realized their market entry at a similar point in time, I assume that they confronted similar context and environmental circumstances—the environmental munificence at time of inception being a criterion for the evolution of the mental maps as found by Barr et al. (1992).

This study’s data collection spans over a period of 20 months. This proved to be the adequate amount of time in order to provide insights from a longitudinal study on the one hand, and to be exempt from major change in the management team on the other hand, with the first change of a CEO being in June 2006 and, therefore, not subject to my observation. More precisely, data collection for this research encompasses three major interview periods: t₁=spring/summer 2004, t₂=spring 2005, and t₃= winter 2005. In the first phase, I interviewed three members of the dominant coalition of each venture. This helped me to validate that the CEO has the most comprehensive and controversial view of the dominant logic as suggested by Calori, Johnson, and Sarnin (1994). Consequently, I concentrated on CEOs of the respective company as interview partners in the subsequent periods.

The minimal condition for a longitudinal comparison across three different age groups is two firms in each age group, summing up to six firms in total. The reason for this is twofold. First, this research design increases the probability of discovering differences across groups and similarity within groups. Therefore, it increases chances of breaking simplistic frames and gaining a more sophisticated understanding (Eisenhardt, 1989). Second, this research design is particularly appropriate for the purpose of the present study as it allows the researcher to go into detail with the most revelatory cases.
In total, this research design involves $36 + 12 + 6 = 54$ interviews of 90 to 180 minutes, which I transcribed, represented in 54 cognitive maps, and analyzed structurally and linguistically. In other words, I created a base line of twelve firms and analyzed only six of these twelve firms for the final analysis that I present here. This procedure of generating a base line of firms allowed me to understand the possible differences in the general structure of the maps and observe possible change from map at t₁ to the map at t₂ at the respective firm.

In a second step, I pursued the two most revelatory cases in each group over three periods of observation. The rationale for this is threefold. First, I assume that I could most appropriately illustrate that the evolution of dominant logic is based on cases that showed the most diverse patterns among the four firms. I based this latter assumption on the suggestion of Bettis, Hall, and Prahalad (1978) to focus on outliers instead on central tendencies. Second, I did not intend to overwhelm the reader with confusing jumps in the data. I rather opt for explaining certain issues within a limited context. Third, the above stated number of interviews and cognitive maps constituted a limit to feasibility for a single researcher in the context of a dissertation. Therefore, I refer in the data analysis to the firms marked in yellow:

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Figure 5: Selection of Sample

### 3.4.3 Consideration of Context

Having discussed the impact of the age of the venture, there are multiple additional factors that are relevant.

Location and the position in industry clusters will definitely influence the environmental munificence. Software ventures in the area of Zurich and Munich are included in the sample. The cluster has an impact on the customer focus: while the
ventures in Zurich are clearly oriented towards the financial industry (e.g. UBS, Credit Swiss, Kantonalbanken, Wegelin & Co, RaiffeisenBanken), the ventures in Munich focus on the large automobile companies (e.g. BMW, Mercedes, and Volkswagen/Audi). Very much linked to the industry cluster factors and the geographical location are network effects (Low and McMillan, 1988) allowing entrepreneurs to enlarge their knowledge of opportunities, to gain access to critical resources, and to deal with business obstacles (Floyd and Wooldridge, 1999).

The vast majority of the sample originated from the principal engineering and business institutions: teams from the Eidgenössische Technische Hochschule (ETH) Zürich and the Technische Universität München (TUM) with the adjunct business school in Munich and teams originating in the business school at the Universität St. Gallen (HSG). In addition, the sample contains teams that spun off from Siemens AG and teams who prior to start-up worked for consulting firms (e.g. Bain & Company, McKinsey & Company). Obviously, I consider the impact of the dominant thinking of these corporations and institutions in the interpretation of my results. Concerning the interpretation of the previous experience before founding the firm, one can say that managers with less company and industry experience, and those with higher levels of education are likely to be associated with greater levels of change (Grimm and Smith, 1991; Thomas et al., 1991 cited in: Barr et al., 1992). Given the level of education of the founders of the ventures is comparable, mainly prior industry experience is subject to particular attention when interpreting this study’s results. Of course, there are other individual factors such as the executives’ personal background (Dearborn and Simon, 1958; Fiske and Taylor, 1984; Hitt and Taylor, 1991), their cognitive style (Hurst, Rush, and White, 1989) and their personal network of social interaction (Shah, Dirks, and Chervany, 2006), which have to be considered.
3.5 Research Process

In this paragraph, I outline the method for data collection, data analysis and theorizing. In order to look at the data in many divergent ways (Eisenhardt, 1989a/1991), I used different sources of data: semi-structured interviews together with documents provided by the company and documents outside of the company. I increase credibility and dependability of my research by carefully adhering to the guidelines by authors such as Lamneck (1988), Mayring (1988), and Eisenhardt (1989/07).

3.5.1 Data Collection

When entering the field, I realized a pilot study on the German and the Swiss experts in the field of Information Technology in order to gain insights in the sense of industry recipes, the evolution of the field of Information Technology and to better understand the particularities of the Information Technology industry in contrast to other industries. The group of experts that participated in this pilot study included Venture Capital Companies, Business Angels, and Technology Transfer Institutions at various Universities. This same group helped me to identify my sample and offered help when contacting firms.

However, this study’s main body of data consists of 54 semi-structured interviews in combination with internal and external document analysis. In the following, I present the two different types of data that I collected. While I used the interview transcripts in order to develop cognitive maps that served as a basis for measuring the evolution of dominant logic, the documents were used to constitute reliable information in order to evaluate the firm’s strategic inertia.
(1) Semi-structured Narrative Exploratory Interviews

The interviews with CEOs and founders of the companies in my sample are neither completely open nor strictly guided, but semi-structured narrative interviews (Schütze, 1977 cited in: Lamneck, 1988, 70), as this type of interview is particularly appropriate for exploratory questions with strong relation to action (Mayring, 1988). The interview leaves freedom for the interviewee to elaborate on his point of view and allows for richness of explanation on the topics referred to by the interviewer but also topics that the interviewee considers relevant. The concept that the interviewee answers freely to the questions clearly differs from a methodology where the researcher imposes topics and assumptions about relations (e.g. Bougon et al., 1977). Whereas the sequence of questions of the interview guideline is adapted to the specific situation in order not to interrupt the natural flow of the conversation, there is a set of open-ended questions that I consistently ask in each interview. The objective of these open-ended questions consists in provoking causal relationships. In order to do so, I use as little airtime as possible. I only devote reasonable time to explain the project in order to gain confidence and raise the interviewee’s interest. The duration of each interview is 90 minutes; the rationale being that this enough time for explanation while avoiding extensive deviations and repetition.

Over a period of 20 months, I travelled repeatedly to the respective company sites in order to capture the richness of the face-to-face situation and to guarantee that the interviewee feels comfortable in his familiar environment. Overall, I am convinced that - compared to telephone interviews - the richness of data largely rewards for time and travel expenses. It is important to note that I asked the same set of questions in the three interviews. Of course, there was a little variation in order of the questions; however, for comparability of the maps I disciplined myself to ask the same why questions at each interview with each company partner.
(2) Documentation

The objective of collecting a great variety of documents was to evaluate the venture’s strategic actions over time, and, hence, derive the measures for strategic inertia. In addition, the collection of various types of documents constitutes an additional means to reconstruct the relevant events in the venture’s history and compensate for potential retrospective bias due to the narrative nature of the interviews.

The documents that were at my disposition varied substantially. The limiting factors in drawing on material were availability and confidentiality. I gathered presentations of strategic moves to internal or external audience (letters to stakeholders and shareholders), annual reports or abridged versions of the annual reports, internal journals, newsletters, ISO certifications and any other quality standard, marketing material and various versions of a business plan.

3.5.2 Data Analysis and Theorizing

As shown above this study relies on diverse types of qualitative data and hence triangulation of data collection, in order to enhance robustness of this research (Krefting, 1991).

I also use various methods in order to elicitate dominant logic. First, linguistic or more precisely text analysis is used for the analysis of the argumentation structure. Second, I use cognitive mapping technique in order to elicitate the dominant concepts in the interviews over time. In the following, I discuss in more detail the latter two methods for elicitating concepts in order to provide robust results.
(1) Developing the Causal Maps

For developing cognitive maps, I follow a common three-step procedure as illustrated by Teegarden et al. (2003): (1) elicit concept, (2) refine concepts, and (3) identify relationships among concepts. In cognitive mapping, a distinction is made between two types of units, i.e. NLU (=natural language unit) and NCU (=natural causal unit) for the causal assertions of the type (A leads to B). Although I pay close attention to the nature of causal relationship (e.g. ‘may-lead to’, ‘has-implication-for’, ‘supports’) for the linguistic analysis and further interpretation of data, I intentionally reduce this variety of causalities to two main causalities, i.e. positive (+) or negative (-) relationship between two variables in order not to overload the maps with information. Precisely, I first identify the German pendant to the conclusions-indicators corresponding to therefore, hence, thus, so, accordingly, in consequence, consequently, proves that, as a result, for this reason etc. and the premises-indicators such as since, because, for, as, follows from, as shown by, inasmuch as (Copi and Cohen, 2002). In a second step, I reveal less explicit causalities. For instance, in a sequence of main clauses without a connector there may be a causality underlying. I detect these causalities and validate them carefully with the interviewee when reviewing the maps.

I consider the maps an analytical tool that provides insights into the argumentation patterns used by the interviewee. Based on this intention, I reached a compromise between authenticity of language and standardization of language in the maps. According to Laukkanen, standardization of NLUs is used for two reasons, i.e. (1) eliminate redundancy and (2) guarantee comparability (Laukkanen, 1994, 327). Given that the intention of the present study is to compare the cognitive maps, I need to compromise on full authenticity when transposing the content of the interviews onto the maps.³³

³³ I compensate for this potential drawback by performing an additional analysis of the argumentative structure.
This study puts particular emphasis on the elicitation method: freehand mapping by the same researcher across all six cases and three points of observation. Freehand mapping is preferred over the alternative method, i.e. pair wise elicitation method (Hodgkinson et al., 2004). Pair wise elicitation refers to the process of systematically detecting causal relationships between variables (Bougon et al., 1977). The particular value of freehand mapping, for this research, in contrast lies in the fact that this method allows me to show the concepts and causal relationship between variables that the interviewee really uses, rather than systematically suggest causalities that the interviewee might not have thought of in order to attempt high structural complexity in a systematic way. While the pair wise elicitation method reduced error of omission, it introduces error of commission from the point of view of a subjectivist paradigm underlying the freehand method. A critic associated with freehand maps is that this method underestimates the true complexity of actors’ mental models, including only a subset of the variables that are relevant for a decision (Baddeley, 1990). However, this is precisely the strength for eliciting concepts of the dominant logic of the interviewee, which I intend to influence in the least possible manner. Therefore, an error of commission would be more harmful to this study than an error of omission (Daniels and Johnson, 2002; Daniels et al., 2002; Hodgkinson, 2002).

Second, the number of concepts and causalities identified by the researcher depends on various parameters: more than on the speed of speech, the number appears to depend on other particularities of the interviewee’s speech, such as the degree of abstraction. Apart for the characteristics of the interviewee’s speech, the number of identified concepts and causalities depends, obviously, on the researcher’s ability to recognize the variables. However, the advantage of this particular research setting is that this bias is consistent among all cognitive maps.

In sum, the simple nature of causal maps (Huff, 1990), is very beneficial as it helps me to structure the material and discern the essential relationship, which I then analyze further in complementary linguistic analysis.
(2) Linguistic Analysis

Linguistic analysis enables me to look in-depth into the concepts and into the causal relations. For the analysis of the concepts (Bougon, 1986), I refer to linguistic analysis, in particular text linguistics and semantics, in order to identify the structure of the signifié (Saussure, 1916). I focus my analysis on the connotations, namely the individual, stylistic, local elements of significance of a signifiant, which overlay its denotation (general meaning), and which go beyond a general, context-independent description (e.g. Diekmann, 1979; Rössler, 1979; Maas, 1985 cited in: Lamnek, 1988). For the argumentation structure, I analyze every single causal relationship the interviewee states. In a first step, I am particularly attentive to the nature of the causal linkages. In a second step, I dissect the arguments referring to the methods used in text linguistics (e.g. Greimas, 1983). Finally, I analyze the semantics: here I refer to forms of analogy such as metaphors, metonymies, similes.34

(3) Consideration and Integration of the Interviewee’s Feedback

Feedback interviews are necessary for validation of the causal maps based on the original interviews. Concretely, the purpose of the feedback interviews consists in confirming the causalities that I assumed when developing the map. I see the potential of inconsistencies in gaining more insights about the main concepts and relationships and, therefore, gaining more insights on the dominant logic. The feedback interviews also serve to identify additional causalities. Hence, usually, the integration of the results from the feedback interviews increases the overall complexity of the causal maps. Finally, the feedback interviews serve to enrich the in-depth-insights from the linguistic analysis. After each interview, I transcribed the material, developed and analyzed the cognitive map (map at t₁, t₂, and t₃), and verified it with the interviewee.

34 Similes and metonymies as well as other forms of analogy—despite not being referred to explicitly here—are also included.
(4) Cross-case Comparison

Once all causal maps were consolidated, I conducted the cross-case comparison. At this stage of the research, I abstracted from the content and took a generic, process-centred stance. Patterns of emergence of dominant logic are supposed to emerge from the analysis. Subsequently, I singled out a reduced number of ventures differing most in their action space as well as the patterns of the emergence of their dominant logic. These ventures were then subject to comparison in order to formulate propositions for this study’s second research question.

3.5.3 Enhancing Validity in Data, Research Design, and Methodology

Since a body of qualitative data (semi-structured interviews and documents) build the basis for this study, construct validity\(^{35}\) is the most prevalent type of validity for this study.

In order to improve this study’s construct validity, I use multiple sources of evidence, maintain the chain of evidence, organize the data and document the data appropriately. In addition, I increase construct validity by having the cases reviewed by managers who participated in the study. As a test for construct validity, I reflect to what extent the observables tend to measure the same thing or different things. Finally, I increase construct validity by theoretical replication, i.e. measuring whether the measures of the constructs (i.e. dominant logic, evolution of dominant logic, strategic inertia) produce results that are predictable from accepted theoretical hypotheses concerning the construct.

Another concern of qualitative studies, such as the present one, is internal validity. I increase the internal validity of this research mainly by two means: pattern matching and explanation building (Yin, 1994). In addition, I show that the propositions that I

\(^{35}\) Construct validity shows whether the correct operational measures have been used for the concepts being studied.
deduce from this research resolve anomalies whereas other hypotheses would lead to anomalies (Christensen, 1997).

*External Validity* or degree of generalizability of results (Yin, 1994) is increased in this study by consistency of argumentation. Through coherent argumentation, I reach results that are general and transferable to other situations. In addition, I increase the generalizability of the results from this study by using replication logic (Yin, 1994). I generalize from the six case studies through ‘analytical generalization’ rather than ‘statistical generalization’ (Yin, 1994, 30). I realize this generalization through a gradual process of comparing the results with the results of other analyses (Lamneck, 1988).

### 3.5.4 Improving Reliability in Data, Research Design, and Methodology

Reliability is to be substituted in qualitative research for methodological reasons, which are mainly grounded in the fact the objective of qualitative research is context-dependence (Lamneck, 1988, 164). The researcher in the qualitative paradigm decided for depth in dispense of breadth of research focus. Reliability in a comparative case study implies a high level of consistency, uniformity, and stability in data production over the units of observation. Second, data should be replicable by other researchers with similar resources (Easterby-Smith et al., 1993). The usage of means of retaining observations and thought during the process of the case study research can enhance reliability.

One of the objectives of cognitive mapping is the reflection and therefore an awareness of issues. Reliability is reduced by the very interaction with the researcher. Even the least intrusive kind of research will change the setting, subsumed in the ‘Heisenberg effect’: “Even if the map is jettisoned, the thoughts generated during its creation cannot be unthought-of (although some may be forgotten) and will affect all subsequent versions” (Schwarz and Jacobs, 1979 cited in: Strati and Nicolini in: Ortmann et al., 1997, 400). Therefore, in this setting reliability refers to the plausibility of results rather than the actual empirical replicability.
3.5.5 Critical Review

This research illustrates the causality of the emergence and concurrent constitution of dominant logic through cognitive mapping. Pondering the various methods, causal mapping technique proved to be the most adequate. In order to compensate for the mono-dimensionality of the causal linkages I use linguistic analysis of the underlying argumentation structure. The chronological sequence of events reconstructed by document analysis together with the narratives from the interviews allows for illustration of the emergence and for drawing conclusions on emerging patterns, and develops propositions on the relation between patterns of evolution of dominant logic and strategic inertia. To conclude, triangulation of data sources and methods together with a consistent research procedure are the principal elements guaranteeing the quality of this research.
4  Results and Discussion

In the following, I present and discuss my study’s results. First, I present the research sites. Then, I discuss each one of the dimensions along which I performed the research: (1) structure of argumentation, (2) evolution of dominant concepts within the cognitive maps, (3) types of justification and their evolution.

4.1  Presentation of Research Sites

In the following, I present the companies constituting this study’s sample. I refer to several characteristics: the founding year, venture capital, company size, management fluctuation, and the ratio between software project, software product and technological platform.

<table>
<thead>
<tr>
<th>Company</th>
<th>Group</th>
<th>Inception</th>
<th>Inception in the 1980ies</th>
<th>Inception in the 1990ies</th>
<th>Inc. from 2000 onward</th>
<th>Venture Capital</th>
<th>Management Fluctuation</th>
<th>Ratio (Project/Product)</th>
<th>Technology/Platform</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpha-Tech</td>
<td>group 1</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>1</td>
<td>145 low (founder-CTO left)</td>
<td>100</td>
<td>100 UNIX®</td>
<td>Sun Solaris</td>
</tr>
<tr>
<td>Beta-Tech</td>
<td>group 1</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>0</td>
<td>50 very low (one of the founders left)</td>
<td>100</td>
<td>100 UNIX®</td>
<td></td>
</tr>
<tr>
<td>Gamma-Tech</td>
<td>group 2</td>
<td>x</td>
<td>x</td>
<td>0</td>
<td>90</td>
<td>50 very high</td>
<td>70</td>
<td>Internet E Business solutions</td>
<td>Enterprise Content Management Solutions</td>
</tr>
<tr>
<td>Delta-Tech</td>
<td>group 2</td>
<td>x</td>
<td>x</td>
<td>0</td>
<td>45</td>
<td>50 very low</td>
<td>20</td>
<td>Library Systems for Universities</td>
<td></td>
</tr>
<tr>
<td>Epsilon-Tech</td>
<td>group 3</td>
<td>x</td>
<td>x</td>
<td>1</td>
<td>100</td>
<td>50 low</td>
<td>20</td>
<td>Microsoft-based products</td>
<td>IBPM, APSIS, Busisy, ImmoWeb</td>
</tr>
<tr>
<td>Zeta-Tech</td>
<td>group 3</td>
<td>x</td>
<td>x</td>
<td>0</td>
<td>55</td>
<td>55 low (CTO left)</td>
<td>20</td>
<td>HR Solution</td>
<td>competitor of SAP and PeopleSoft</td>
</tr>
</tbody>
</table>

Table 1: Firm Characteristics (Part I)

In table 2, I present more information on the six companies contained in this study. I refer to their origin, the country, the industry focus, whether the firm focuses on a function within the business, the composition of the dominant coalition, and prior experience of the members of the dominant coalition.
Table 2: Firm Characteristics (Part II)

Common to all firms contained in this sample is that they are ventures in the software industry in German-speaking countries. The ventures are presented in three different groups by their age (=date of inception). The firms face a comparable environment during the observation period (2004-2006). However, they have different prior experience. While the firms in group A (ventures founded in the ’80s) have seen various economic and industry cycles and fundamentally different technologies and market conditions, the firms in group C (ventures founded since 2000) are experiencing their first economic downturn and major change with their company. I expect the age difference to result in diversity in the interviewees’ reasoning process. Furthermore, the firms differ in criteria such as size (=number of employees), initial financing (venture capital or not), and leadership structure (size of top management team). Therefore, the firms show variance in their objectives and orientation: interesting exit options, financial objectives, social value for the employee and society, shareholder value maximization, growth, or sustainability. Given the qualitative and exploratory nature of this research, this diversity is a prerequisite for understanding different potential developments of a dominant logic.

In the following, I briefly refer to the background and orientation of the six companies that constitute this study’s sample.
Five students in information technology founded *Alpha-Tech* in 1988. Alpha-Tech specializes in the evaluation, development and integration of secure web applications and portal solutions. Alpha-Tech develops tailor-made intranet, internet and extranet solutions in close cooperation with major financial service and telecommunication companies. Several companies are associated with Alpha-Tech, two of which are located abroad. One is located in San Mateo, California, and the other one is located in Budapest, Hungary. Alpha-Tech has seen several growth periods and has now 145 employees, of which 70% are engineers. Nowadays, Alpha-Tech is a well-recognized leader in its market: a high end, highly customized and technological niche market.

Founded in 1984, *Beta-Tech* is a spin-off from a major technology corporation and is associated with a technological university. The company had two major products that were highly successful in the German software market. However, over time the products lost their superior position in the market place due the fact that Microsoft became the dominant technological platform. At that time, Beta-Tech changed strategy and started to enter the market of technology consulting or body leasing, where today it makes most of its business. Recently, Beta-Tech started an initiative to develop a new version of its flagship product through open-source development.

*Gamma-Tech* emerged in 1996 from the integration of a small media company and a small highly technologically oriented consulting company. Today, Gamma-Tech clearly emphasizes the business side and the technology side of their business over the creativity-based side that the small media company represented. Today, the core business of *Gamma-Tech* is Enterprise Content Management Systems and E-commerce solutions. Gamma-Tech serves a wide variety of clients in numerous industries. The company saw substantial growth during the observation period. In the past year only, the company increased the number of employees by 30%. Today Gamma-Tech has 90 employees and has subsidiaries in two major cities.
Delta-Tech is a spin-off from a technology corporation. Founded in 1997, Delta-Tech specializes in database solutions and information portals. The company serves the German-speaking library market. More specifically, Delta-Tech’s focus is on academic libraries. Given market saturation and consolidation of IT solutions in the German-speaking library market, Delta-Tech recently merged with a major organization that offers database technology for library services worldwide. In this new constellation, Delta-Tech continues serving the German-speaking library market. The number of employees at Delta-Tech was stable during the observation period, almost no fluctuation.

Three consultants founded Epsilon-Tech in 2000. The company’s vision consists in developing and running a platform based on Service-Oriented Architecture for the global real estate industry. However, in order to reach this vision Epsilon-Tech needed to build an in-house consulting business. Today, Epsilon-Tech clearly positions itself in the market for Infrastructure Life Cycle Management. Epsilon-Tech acquired several smaller companies in order to gain access to market or technology. The company started its operations in Germany, but has subsidiaries in various countries. Recently, the company opened their office in Dubai in order to serve the Middle Eastern market. The company is venture-capital funded and is clearly growing at a very fast pace.

Four graduates from different disciplines founded Zeta-Tech in 2000 as a spin-off from a business school and a technological university. Zeta-Tech develops and implements customized HR solutions for corporations. At inception, Zeta-Tech had another business, a platform for start-up firms, venture capitalists, and business angels. However, Zeta-Tech separated itself from the other business in 2001. Zeta-Tech underwent a major restructuring in 2004 and 2005 and is now expanding its markets to standard software products, a very different way of doing business from the way it started out. In addition, Zeta-Tech no longer focuses on the German-speaking market but is moving towards being an international player.
To conclude, the companies vary a lot in their respective trajectories. In the next part, I discuss the argumentation of the core business of the six companies selected for in-depth analysis. The discussion of the argumentation structure will emphasize many more details about the strategic moves, convictions and values.

### 4.2 Structure of Argumentation

Here, I illustrate different types of argumentative structure as detected in the above-presented ventures. First, I analyze the arguments concerning the core business of a given firm, hence, core elements of the firm’s logic. Second, I present the firm’s core business. Referring to Toulmin’s model of argumentation as illustrated as part of the theoretical building blocks, I focus on the differences in the argumentation.

#### 4.2.1 Ventures founded in the 1980s

Alpha-Tech and Beta-Tech are two ventures founded in the 1980s. The two companies show a great variety of argumentation patterns when reasoning about their core business.

##### 4.2.1.1 Alpha-Tech

The first outstanding quality of the reasoning at Alpha-Tech is the clarity with which top executives argue for its core business. This becomes evident in the argumentation by negation (of what is not the core business), the intentional breakup of causal chains, and by referring to the core business when asked for other strategic possibilities. In the attempt of reducing the difficulty of describing the core business, the interviewee chose to describe what it is not. This does not only result in clarity but also opens the action space for the many things that have not been negated and that may be somehow related to the negated action, or the category of the negated action is change (e.g. through generalization). This is particularly easy to do since the negation leads to emphasis of the negated element. The negation clearly draws a line between single issues that are unwanted as opposed to all issues that are wanted, issues that are
invalid in contrast to all the ones that are valid. In sum, the negation opens up for action many other subcategories of which the negated unit is one.

(1) Argumentation by Negation

Frequently, the CEO of Alpha-Tech intentionally ends the causal chain and redirects on his argumentation back to the company’s core competence, i.e. software engineering. The following example illustrates this mechanism:

“I think that we have an extremely clear understanding of what is our core business, and we do also have a very clear understanding what is not our core business. From the very first day, we have focused on doing only what we thought that we could do. We did various things and learned that these were not part of our core business. Therefore, there was change, but essentially, we never tried to sell real estate or hardware, nor be involved in training, etc. From the beginning, we developed software and we continue developing software” (Alpha-Tech).

Another example of such an intentional breakup of the causal chain is the following:

<table>
<thead>
<tr>
<th>Infrastructure (¬) → product (¬)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructure ≠ core business</td>
</tr>
<tr>
<td>Core business → demanding problem solving software projects</td>
</tr>
</tbody>
</table>

“Furthermore, if you have been developing software for 13 years, you create products. Alpha-Tech has products in its portfolio. These are software packages, which we developed for a customer. At some point, the customer told us: yes, we are interested that this software is sold; you are allowed to license that further out. The condition to render that project successful would be an entire infrastructure for software support, etc. That is not our core business.” (Alpha-Tech)
(2) **Argumentation by Intuition**

Several causal chains concerning the core technology, a component of Alpha-Tech’s core business are rooted in intuition. This type of justification is similar to what Tell (2004) refers to as justification by performance’. Several decisions around the core business are based on the intuition and prejudices of Alpha-Tech, e.g. the decision on the technological platform:

1) Excitement for platform  
2) Stability of platform  
3) Professionalism  
4) Other’s opinion  

> Platform (Unix(R))

“I had a *gut feeling*. I liked the platform better. I had the prejudice that this was the more exciting tool, their operating system is more stable, and that it is more fun, much more professional. Fortunately, the prejudice became true, but it was a *pure prejudice*. I had heard it from *other people*, they said: that’s it. I had no clue at all.” (Alpha-Tech)

The interviewee at Alpha-Tech mixes arguments that are grounded in facts with arguments that are based on personal preference or intuition.

(3) **Argumentation by Authority**

In many instances, the argumentation at Alpha-Tech is authoritarian. The CEO’s authority constitutes the warrant of the claim and therefore validates the argument. The CEO assumes that nobody can be knowledgeable about the issue. Therefore, he does not believe that group discussions will reduce ambiguity. The CEO chooses to make the decisions himself:
“The way this firm does it [core business] is as undemocratic as you like: the absolute dictatorship. It’s me who decides and that’s it.” (Alpha-Tech)

The arguments are ideological, intuitive, and based on authority.

(4) **Argumentation by Ignorance**

“The guidelines are relatively flexible; they are mainly in my head. […] Software can be developed by a few people. The size of the project makes no difference. It is a question of principles how you develop software. […] I have my notions, how software should be written and of course, for those people I mentor, I look a little bit to see that they are doing it similarly. I often explain it to them with an example, not in detail.”[…] “It’s the chaos principle. It is simply written, *I don’t know in the least how this functions.*” (Alpha-Tech)

The above-mentioned mechanisms help Alpha-Tech to end chains of reasoning behind core arguments and create principles on which to act. In the following, I refer to the argumentation at Beta-Tech and then compare the two firms on their argumentative patterns.

4.2.1.2 **Beta-Tech**

The CEO of Beta-Tech employs four distinct forms of argumentation: negation, non-identity, ambiguity, and ignorance.

(1) **Argumentation by Negation**

Beta-Tech’s CEO defines the firm’s core business with clarity and decisiveness. He is very explicit in what Beta-Tech does *not* want as opposed to what Beta-Tech wants.
“At that time we did not think that much about the customer, we thought more in terms of products; we thought to explore new avenues. That meant that we didn’t want to develop old software, but we wanted to develop new software; no old operating systems, but new operating systems; languages of the future; and we wanted to make products. The urge to develop products was prevalent. Material, products, sustainability: all this was important at the time. We wanted to make products since this leads to sustainability and multiple turnover. We didn’t want service, which creates linear progress, but geometric progress and turnover that is not limited by simple resources such as time.” (Beta-Tech)

(2) Argumentation by Non-Identity

Beta-Tech identified numerous opportunities in the course of this research project. These opportunities are internally motivated rather than externally motivated. The choice of technological platform (clear preference for UNIX®) illustrates very well this type of argumentation.

“We wanted to bring something new. We said that there is a new technological route, and this was UNIX®. On UNIX® you can develop software, in the way that there is a user interface, that people can work much better with it. That means that UNIX®
enabled us to develop software that is much more apt for daily life, much more relevant for practice, with fewer rules and more intuitive. That was the goal. Well, we wanted to use the newest possibilities, to create new products that are much easier to use.” (Beta-Tech)

Moreover, authenticity and ideological argumentation are means to prevent Beta-Tech from exploiting certain opportunities that are potentially misleading. In other words, we observe here identity resistance, meaning that change is inconsistent with the firm’s organizational identity.

“Well, regarding the topic of knowledge management we learned the hard way that we are not good at developing things simply in our heads. Well, this is certainly linked to the market place at the time, where the rule was to conceptualize new ideas, to print them on high gloss, to create a brochure for the stock market, and then the market will buy that from you. For many firms that worked. A few organizations still live off the money that they earned at the time. Well, we recognized that it does not work for us to develop something on a purely theoretical basis. We need to be able to say: that’s something that we are proficient in. We need to be somehow authentic” (Beta-Tech).

Beta-Tech identifies very much with its two original products, which constituted a huge success. These two products are extensions of Beta-Tech’s core competences. Even though these products no longer constitute an important part of sales at Beta-Tech they provide legitimacy for the firm. A business activity that is too far from the origin of the firm’s core competence is deemed not to be successful at Beta-Tech.

(3) Argumentation by Ignorance

Beta-Tech is highly aware of ambiguity.

“Yes, in the first years it was very easy to stay innovative. During these years, we were always among the first, whatever that may be due to” (Beta-Tech).
The interview partners at Beta-Tech formulate hypotheses without consciously considering the factors that may lead to success or failure.

“A position has to be evaluated. It is really true that if you ask ten people, you will hear different judgments from ‘lost’ to ‘won’ or ‘slightly better’ or ‘slightly worse’. And a [chess] grand master has better accuracy. If old Tarrasch came and he would say better or worse, then this would probably be correct” (Beta-Tech).

(4) Argumentation by Ambiguity

The CEO of Beta-Tech demonstrates a very particular trait in his argumentation: ambiguity. Repeatedly, the various interviewees at Beta-Tech refer to an open causality. They cannot explain the basis for their decisions that most affect the core business at Beta-Tech. The following are examples of argumentation ending with an ambiguous argument:

“Good numbers. There is always a related question: what is that? Is it a success if I have an income return of 10%? Or is it a catastrophe because the risk is incredibly high?” (Beta-Tech)

“I am not even sure whether growth constitutes an indicator for success. Today, everybody believes in growth. Besides, you have to distinguish qualitative growth from quantitative growth” (Beta-Tech).

“In 1986, Rappaport, inventor of shareholder value, was the very first to have said: the organization has only one purpose, and that is the generation of profit and an increase of the organization’s value. That is very different from what we learned at school in economics in 1963 and 1964. We learned that the organization is a social system that has to fulfill a duty toward the government, the employees, and itself. Profit
generation is an important purpose that keeps the organization alive, but not the only one. Profit is necessary; we learned that in business studies” (Beta-Tech).

In sum, Alpha-Tech uses a lot of *argumentation by authority or argumentation based on intuition*, while argumentation at Beta-Tech is primarily by *ignorance* and *ambiguity*. Alpha-Tech assumes that critical factors are *unknowable*, whereas Beta-Tech assumes “we don’t know.” While these two mechanisms are very distinct, both of them terminate the causal chain concerning fundamental issues of the firm. However, the mechanism observed at Alpha-Tech lead to earlier termination of the causal chains than the argumentation at Beta-Tech. Beta-Tech’s ambiguity is evident in its discourse with this researcher. The interviewees provided several possible scenarios but did not lean towards one or another.

For instance, Beta-Tech’s CEO reflected on the firm’s values and hence the pricing of software engineering in the future at Beta-Tech. I observed a similar mechanism at Alpha-Tech; however, the interviewee terminated the causal chain by attributing pricing to external influences, which are not under Alpha-Tech’s control and hence less worthwhile to reflect upon than internal issues are. This latter example shows the effects of the different ways of classifying influences on the length of the causal chains of Alpha-Tech and Beta-Tech.

### 4.2.2 Ventures founded in the 1990s

Here, I present the reflections on the core business by Gamma-Tech and Delta-Tech, two firms founded in the ’90s, and point out particular mechanisms that I observed when analyzing their argumentative patterns.

#### 4.2.2.1 Gamma-Tech

Initially, Gamma-Tech offered its customers a broad range of internet services. With the growing business related to internet services, however, this definition became too broad. Therefore, Gamma-Tech constrained its core business to Enterprise Content
Management (ECM) in order to gain credibility in the marketplace (through studies claiming the success of this business) and still provide a wide range of offerings. ECM constitutes a category that competitors used at the time that Gamma-Tech was searching for its identity. The identification with ECM resulted from a change of perspective within Gamma-Tech. First, Gamma-Tech thought ECM did not cover all the services and products its company offers. However, Gamma-Tech later changed its perspective when the IT manager for one of its customers indicated that the category adequately represents Gamma-Tech’s business.

(1) **Argumentation by External Legitimacy**

Relying on the wisdom of the marketplace rather than that of management or the user (as Alpha-Tech and Beta-Tech do), Gamma-Tech assumes the perspective of the customer:

“And then we simply started to test, and we let this process [of reflecting on the core business of Gamma-Tech] go on in the heads of our employees. Surprisingly, we had to reject all our previous hypotheses. First, we realized that we actually do make 80% of our turnover from very specific fields, namely in the field of Enterprise Content Management and in the field of E-Commerce Solutions. Prior to this realization, we had the impression that our business was highly diversified. But from the perspective of a CTO, who allocates 100% of the IT budget, it makes a lot of sense to have only four or five suppliers” (Gamma-Tech).

“Then we say: ECM, E-Commerce or we say: we are a general store selling about everything. […] We also don’t have to discuss every time, each day what is core and what is near core and what is not core, etc. […] We don’t have to argue whether a specific trade show is interesting for us or not. We can say for *many things: that is not interesting for us*. That is liberating, I think” (Gamma-Tech).
The decision for Enterprise Content Management is a way for Gamma-Tech to gain identity in the market place. This category existed already and studies predicted future success. Therefore, Gamma-Tech considers it a legitimate category to identify with. In summary, assuming the customers’ perspective, Gamma-Tech managed to define its business. This underlines the customer-oriented logic prevailing at Gamma-Tech, which is going to be shown more explicitly in the analysis of the cognitive maps at Gamma-Tech over time.

In order to open up this opportunity space, the firm has obtained an official certification for the dominant technological platform. In general, the technological decisions are subordinated to the business decisions as shown in the following quote:

“The awareness concerning the whole bundle of technologies has increased. Microsoft, core technology and programming languages were not that important to us. That has changed. We made certain investments. In the meantime, we became a certified Microsoft partner. That was very important since there are two different ‘worlds’ in our market: one is the Java world, the other one is the Microsoft world. There are firms that do only one or the other, but we do both. That makes sense since we install standard application software for our customers or need to create interfaces to standard applications. Typically, this is a heterogeneous task. There are not projects involving only one or the other. Therefore, we can’t say we do only this or that because this would mean that our market would be 70% smaller” (Gamma-Tech).

In general, Gamma-Tech consciously relies on externally legitimized categories and technologies in order to build its reputation.

(2) Argumentation by Analogy

Gamma-Tech came about in 2000 through a merger between a creativity-focused firm and a technology-focused firm. The two executives driving the new company had formerly worked for a major consulting firm. Therefore, the driving force was
business-oriented and the logic became based on efficiency and effectiveness in terms of financial growth. This process is illustrated by the following comment from the CEO:

“In December 2000, a colleague of mine joined, who also came from Chi-Consulting, who also thought in spreadsheets, who also didn’t do that for fun but to earn money. That is an essential factor. In the time frame of six months, the people who founded the organization didn’t dominate any more. The ones who saw the medium as a creative activity didn’t dominate any longer, but were replaced by the ones that came from the outside, who came from a professional service firm that was highly profitable, where people worked 70 hours a week, where people earned well their living, where people were smart, where people were fast and so forth. But most notably, there were certain structures and certain rules of the game, according to which one had to work and have success” (Gamma-Tech).

“I believe that we have managed to bring together two organizations that were relatively different in their rhythm, that we have transferred the best of both worlds—and that relates to the fact that our organization was more oriented toward consulting and more creative, and on the other hand the other organization was more focused on technology but also on consulting. I would even say we had a very technology-focused organization in Bern, on which the IT technology could grow very well. And that somehow had logic to it that we wanted to merge the three pillars of consulting, creativity, and technology. These are three different worlds. The day won’t come that a designer will be able to talk effectively with a technology guy. Rather they are merely exchanging information because they function fundamentally differently. You shouldn’t try to correct for it. It’s also important that every person excels in her respective field. A developer’s thinking has to be extremely well structured. A person working in the creative field that has extremely well structured thinking may not be a contradiction in itself, but at least it is rare. And mixing the three things together is definitely not a trivial challenge” (Gamma-Tech).
Later on, Gamma-Tech’s CEO argues that there is a commonality in the thinking patterns of the technology and the consulting section of the firm, whereas the creativity part is different.

“We do not think any longer that we want to be competitive in the field of creativity. That has always been that way. Most of our competitors and ourselves simply say: our organizations are important because we are a melting point of creativity, business consulting, and technology. A crucial insight has emerged from our discussions: mental structures and problem solving structures in the areas of technology and business consulting are essentially similar” (Gamma-Tech).

Reasoning by analogy stands out at Gamma-Tech. At the outset Gamma-Tech had three different competencies: technology, creativity, and business. As its leaders are from the field of business and define the purpose of the organization specifically in business terms, the company naturally places greatest weight on business arguments. Through reasoning by analogy, technology is said to be similar to business. Therefore, technology receives legitimacy. Creativity, however, is categorically discredited, mainly due to the difficulty of quantitative or objective evaluation. The company associates business and technology with efficiency and rationality. This has become more prevalent over time; the slogan on Gamma-Tech’s website reads, “Responsibility for Efficient Information Technology.”

4.2.2.2 Delta-Tech

Delta-Tech was founded in 1997 as a spin-off from a major technology corporation in order to serve the German-speaking library market. At the outset, Delta-Tech had a product that was not integrated and needed investment in technological updates. However, the company had customer relationships that could be used in order to promote their new solution for the library market.
In July 2005, Delta-Tech merged with Tech-Co₁, a worldwide leading producer of library systems. The library system business, which had long been stable, changed substantially during the past couple of years. Toward the end of the observation period, Delta-Tech came to perceive its biggest competitors as providers such as Google and salesforce.com.

Delta-Tech reunites three areas of competence: (1) experience in the library market, (2) technology, and (3) customer relationships. The customer relationships in combination with the knowledge of the library market clearly dominate the reasoning at Delta-Tech and technology is clearly seen as a means for improving customer satisfaction:

“Well, the technology does not play a very important role. Technology is necessary because it forms the basis of our business, but it is rather the means for a goal. The best that wins recognition, you can take it. But we don’t invest a whole lot of research into that” (Delta-Tech).

Clearly, technology for Delta-Tech is a means to reach an end, i.e., customer satisfaction. The business needs are driven by the customer rather than by the technology. Here again, the motivation for the decision against the adaptation of the software for Windows NT is based on a business logic or market logic rather than on technological considerations.

(1) Hypothetical Argumentation

The transcripts of my conversations with the founders of Delta-Tech abound with hypothetical argumentation. In the first example, its CEO argues why he decided not to develop an NT solution. The interviewee is persuasive in emphasizing the differentiation of the hypothesized behaviour of the market segment that Delta-Tech mainly occupies.
“We investigated at the time [deciding whether to introduce an NT solution or not] the outcome of producing a solution for this market and the chances of success. When we saw the time for development and the cost in relation to potential, then we realized that it is not worthwhile. We calculated that we would also lose customers since some customers will introduce an NT solution. In order to understand this issue, I suggest reconsidering the market segmentation that we have in place. We have academic libraries and public libraries. For the academic libraries, the tendency toward NT is not that strong as for the local authorities. Since the academic sector is a relatively big market segment for us, that danger is not very great that it would have been worthwhile to think about it more seriously. What we see is that the financial means for the local authorities have been cut a lot as opposed to the regional authorities, where the universities are and there are greater financial means. Therefore, this market segment continues to be the more interesting one. In this respect, the decision has proved to be right, even more so as the local authorities think about Linux for reasons of cost savings. Therefore, we can say that it was worthwhile to sit the debate out” (Delta-Tech).

This illustrates that the process of the evaluation of strategic initiatives at Delta-Tech is very well considered. Many reasons are behind the decision of not developing a library solution for Windows NT.

In the following, I refer to another hypothetical argument, which is combined with *argumentum ad metum*, i.e., technology-focus is associated with risk.
(2) Argumentation by History

(1) History
(2) Customer relationship
> Know-how (represented by experience of employees in different areas)
> Solidity
> Innovation

“Well, I think, due to our history and our customer relations, our company is associated with very good know-how, which is represented by the employees, who have been working in this field for a long time. We have librarians, we have IT people, we are recognized, I think, outside, for doing solid stuff. Maybe we are not always seen as highly innovative. That may have changed a little in the past, where we have demonstrated what we can produce” (Delta-Tech).

The interviewee at Delta-Tech consistently refers to the firm’s history and experience in its highly specific market segment. The knowledge that has been acquired over many years constitutes the fundamental justification for the CEO perceiving Delta-Tech as solid and having continued success. Given these prerequisites, Delta-Tech is reluctant to enter other markets, e.g., that of knowledge management for business organizations. This opportunity was recognized, explored, and evaluated, but the market was not entered due to insufficient internal resources for obtaining a competitive position.

4.2.3 Ventures founded since 2000

Here, I discuss the argumentative patterns of Epsilon-Tech and Zeta-Tech, two new ventures founded since 2000.
4.2.3.1 Epsilon-Tech

The vision of Epsilon-Tech is to provide an *ASP platform for the real estate industry*. The CEO defines Epsilon-Tech’s core business as providing project-oriented software for the real estate industry, which supports the entire Infrastructure Life Cycle. Consultants from a major consulting company founded the firm five years ago with venture capital from a major venture capital firm and a highly recognized bank.

Despite the recognition that the construction industry allows only for limited growth due to the size of the market and the long-lasting depression of this particular segment, the firm’s core business remains in the real estate market.

(1) Argumentation by Priorization

Based on the priorization of business objectives, Epsilon-Tech has prioritized its values and rules:

1. The customer’s interests always come first.
2. We invest as much as possible in products.
3. We encourage teamwork in everything we do.
4. We behave like a “firm” in every respect.
5. Our firm is the sum of its projects.

(2) Hypothetical Argumentation

The CEO of Epsilon-Tech has a clear vision of general developments of organizations:
“They [small and medium sized enterprises (SMEs)] will all be very much focused on the customers. All that can be produced in small amounts, the firm will organize according to projects. All that is produced in large amounts, will be industrialized. The project is then in development as they say, in run-up. Well, the working population will increasingly work together in projects. Organizations are organized around core competencies. They are mostly medium-sized. An organization that is organized around a core competence can’t be large. A large organization can’t have a core competence: you can’t equip 3,000 or 300,000 people with a core competence. Therefore, the companies will be organized as medium-sized organizations. And, as the organizations will want to serve their customers by working in projects, which have only one core competence, customer-oriented leadership, focus on core competence, and focus on projects. These are the three big management paradigms of the ’90s. Customer orientation, management, and project orientation with business process reengineering are the big paradigms of the years up to 2000. All this leads to the conclusion that in the future, people will be working in medium-sized organizations in projects and will have a problem, where transactions arise, when they want to initiate a new project, everybody has to coordinate. That is an important problem” (Epsilon-Tech).

Particularly revealing is Epsilon-Tech’s rationale for the choice of and future potential for the core business based on the believed trends.

The rationale for the core business of Epsilon-Tech is the anticipation that a certain segment will require vastly more SMEs in the future. These SMEs will need a platform to exchange documents. The platform will relate to the real estate rather than
to the individual. Because its goals were not achievable directly, Epsilon-Tech needed to identify sub-goals that were initially beyond its strategy:

“We built a business based on projects and solutions. At some point, we introduced a consulting unit. We wanted to introduce ASP software, which is as far away from consulting as could be. However, when we realized that nobody in the market place understood what we were selling, we started building a consulting business. That was in 2001. We get good returns from that. That was not our plan. We thought all the time: what would be a better way to do that? Do we really have to do that? Therefore, we can say that the initial business plan had the function of a light house” (Epsilon-Tech).

The company’s long-term plan of developing an ASP platform helps Epsilon-Tech to stay focused. Any time there is uncertainty whether to pursue an opportunity, Epsilon-Tech asks the question: “Does that help us to reach our goal of establishing an ASP platform?” This long term orientation becomes obvious if one considers the sheer length of the above causal chain arguing for the core business. In addition, the above hypothetical argumentation gains strength from drawing upon an observable trend: a shift towards a greater number of small and medium-sized firms. A noteworthy effect of this argumentation of the vision of the core business at Epsilon-Tech (i.e., development of an ASP platform) is to connect initiatives and actions that might otherwise appear disjointed. Hence, strategic actions that may be perceived as inconsistent from an external perspective are consistent with respect to the firm’s vision.

(3) Argumentation by External Legitimacy

Epsilon-Tech’s CEO grounds his argument in external legitimacy. In the following example, Epsilon-Tech argues with reference to the legitimacy of a competitor and the legitimacy of analysts:
Epsilon-Tech has clearly defined a category that received recognition from business analysts: Infrastructure Life Cycle (ILM) as a project management speciality applied to the real estate market.

“Last year, we started to observe the market in a way to reveal more insight on the question: What does our software category stand for? That is when we came across PPM and we positioned ourselves in that field. Our largest American competitor is now positioned in the field of PPM. Two weeks after we started to position ourselves with PPM, they also had done so. After a while the competitor changed it into ILM. In fact, they had found analysts who did PPM for real estate. We discussed whether we wanted to stay with PPM or did we want to switch to ILM? Then we decided to go for ILM because it is the right subcategory and the right industry. Analysts are working on it. That is reassuring. That also is reassuring for customers and therefore eases their decisions” (Epsilon-Tech).

Once Epsilon-Tech identifies with the ILM category within the real estate industry, there are clearly positive effects on its customers. That Epsilon-Tech was among the first to use this category of management software specific to the construction industry has bolstered its legitimacy with analysts.

The argumentation at Epsilon-Tech on external legitimacy is particularly effective, as the argumentation relies on two sources of legitimacy: a customer who has legitimacy in the eyes of Epsilon-Tech (which is the reason why the CEO checks this competitor’s website for current developments) and multiple analyst reports on software to manage the ILM software.
In sum, the argumentation of the core business at Epsilon-Tech displays numerous distinctive features. The argumentation by priorization constitutes an extremely effective means for Epsilon-Tech because it enables immediate action. The hypothetical argumentation, which is based on an observable trend in the software industry, gives Epsilon-Tech a vision and results in a particularly efficient effect, i.e., the argumentation of unrelated business activities by being related to vision. Together with Epsilon-Tech’s clear focus on how business is done rather than on what is done, this effect results in extraordinary flexibility. Finally, Epsilon-Tech’s analysis revealed argumentation by external legitimacy. This legitimacy of analysts is used to increase the legitimacy of Epsilon-Tech and can be used in turn for the internal argumentation of the customer for Epsilon-Tech. This can be a self-feeding cycle if the customer buys products of these software categories, because this, of course, increases the legitimacy of the analyst and Epsilon-Tech.

4.2.3.2 Zeta-Tech

Zeta-Tech started together with another venture, a firm focused on start-ups and new venture activities. Zeta-Tech officially separated from this other firm. Today’s core business of Zeta-Tech consists of development and implementation of Human Resource software.

Four students from different disciplines who shared an entrepreneurial mindset founded Zeta-Tech in 2000 in St. Gallen. Zeta-Tech has more than 50 employees and more than 100 customers in Europe, America, and Asia. The technology focus is on multi-layer software and configurable XML. Over time, Zeta-Tech developed several clear-cut definitions of what Zeta-Tech does and what it does not do. The clarity of definition of today’s core business reflects the emerging ideological assumptions of the firm.
(1) Argumentation by Negation

<table>
<thead>
<tr>
<th>Argument</th>
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<tbody>
<tr>
<td>Country-specificity of payroll</td>
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<tr>
<td>Regulation</td>
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<tr>
<td>Payroll (-)</td>
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<table>
<thead>
<tr>
<th>Argument</th>
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<tbody>
<tr>
<td>Organizational structure (-)</td>
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<tr>
<td>Payroll (-)</td>
</tr>
</tbody>
</table>

“For instance, we don’t do payroll. We will never do that. Precisely because it is too complicated, you have to consider issues that are country-specific and different legislation. I don’t want to say ‘never’; maybe we will get bored at some point and want to expand. That is a principle, where we say: payroll leads to too much, we would not have the structures to do that” (Zeta-Tech).

In sum, payroll is clearly not part of Zeta-Tech’s core business. The interviewees from Zeta-Tech provided numerous reasons for this decision, including that payroll implies too much complexity because of country-specific differences in legislation. Zeta-Tech manifests a particularly clear attitude, which is striking considering that the firm is in its early stages. One would normally associate such a categorical negation of certain strategic fields with firms that have been in the marketplace for a substantial time and therefore have experienced multiple economic cycles, such as in the case of Alpha-Tech or Beta-Tech.

(2) Argumentation by External Legitimacy

“When we started our company, we had the opportunity to speak to the CEO of Pixel Park, a star of the new economy, and he said: ‘What you are doing, I think it is great. I also think that this will be relevant in the future: profiling and matching.’ That’s when the notion emerged that we said: we are doing profiling and matching” (Zeta-Tech).
The argument for Zeta-Tech’s future core business, notably developing and selling a standard HR software application, is based on external justification. Here, external justification is particularly interesting because legitimacy results from dialectical consideration of the firm’s prior experiences. In other words, many of its current assumptions contradict those that were made early in the history of the firm, e.g., producing highly priced and customized software products for corporations. Now the firm wants to pursue a business that is very different from the existing business. Standardized software has a much lower level of customization and a different pricing structure:

“If you look at salesforce.com, that’s software, you go online, you pay and you work online. That’s exactly how things ought to be, more standard products. We don’t know the customers, we don’t have to interact with them, and they simply work using our software” (Zeta-Tech).

“Whereas we used to charge 100,000 [CHF] per year, we charge now a yearly fee between 500 and 5,000. Those are different worlds. We cannibalize our own market, but our goal is to enter the market from the bottom and to get the return through quantity” (Zeta-Tech).

The firm considers the experiences of the key players on other technological innovations and positions itself in differentiation to their experiences while adapting several fundamental ideas:

“We are reaching out for standardization of our own business. We visualize this as a pyramid. When doing solutions at lower levels, you have the greater volume. If you do solutions in the lower levels you have to target larger firms as they can bring in projects and volume. If we make a product, we are on the upper level. This is how SAP and Oracle started their business. Then there are others who overslept these developments, that’s Microsoft. They provided flow for databases, internet, and
server-operating systems. *Oracle*, they do really good databases. For a long time *Microsoft* did not do them. And then people became aware of the importance of databases. And then it started with *Access*, and everybody laughed about it. That’s not a solution. *SAP* laughed about it. It was substantially easier and everybody understood and then they started with *MySQL*, a very good database. And today, they come from the lower levels” (Zeta-Tech).

(3)  **Ideological Argumentation**

A particular form of argumentation that I identified in the interview transcripts of Zeta-Tech is *ideological argumentation*. It was surprising that over the observation period, I had a chance to see how Zeta-Tech developed a clear ideological stance not only on the positioning of its product but also an organizing principle of its emerging organization.36

The content of the emerging ideology at Zeta-Tech is based on the concept of simplicity. More precisely, one of the major argumentation patterns around this concept at Zeta-Tech goes as follows:

<table>
<thead>
<tr>
<th>Simplicity</th>
<th>Utility</th>
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<tbody>
<tr>
<td>Simplicity (-)</td>
<td>Extension (+)</td>
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<tr>
<td>&gt; Complexity of system (+)</td>
<td></td>
</tr>
<tr>
<td>&gt; Speed of system (-)</td>
<td></td>
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</tbody>
</table>

“This [a particular feature in the software program] is a typical example of total simplication that leads to a lot of utility through its simplicity. There are many
examples. There are many things that I learned over time. I dedicated a lot of time to the study of the concept of simplicity. I gave many presentations on the topic of ‘courage for simplicity’ and what that means. And that is also something that we—as an organization—still have to learn because I think that in many areas we are still far from there. We discuss with clients in projects: that is absolutely necessary and that has to be that way, if not it does not function. And then to have the courage to say: that’s possible, but we will not do it because it is too complicated. We see that everywhere where we do complicated solutions, people later start to find work-arounds and then the system gets more and more complex and eventually much slower. You need to have the courage to decide for simplicity in many things. That is something that has developed over time. That is something that I have seen somewhere, but every provider says in our day: I am simple. Everyone says that, also SAP and many others. But what simplicity means is not all that clear. On the one hand there are clearly methods and technologies. […] I am currently working intensively on the topic of usability, mainly to convince people to spend time and have the courage to choose simplicity because sometimes simple solutions look simplistic” (Zeta-Tech).

In sum, I discern three outstanding argumentation mechanisms at Zeta-Tech: negation, external legitimacy, and ideological argumentation. Even though this summary only presents a few very striking examples, there is a link between the ideological argumentation of simplicity and the example of negation: simplicity as the opposite of complexity reinforces the decision of Zeta-Tech not to engage in business related to payroll. Comparing Zeta-Tech’s argumentative patterns with those of Epsilon-Tech indicates that the firms partially overlap in their usage of external legitimacy; however, they show substantial differences in the remaining types of argumentation.

4.2.4 Summary

The above analysis revealed various mechanisms for the reasoning behind the core business: negation, intuition, authority, ignorance, non-identity, external legitimacy, intended ambiguity, analogy, history, priorization, hypotheses, and ideology. These
forms of argumentation function as efficient justification preventing further questioning of the assumptions in many cases.

At Alpha-Tech and Beta-Tech, the oldest firms in this study’s sample, the argumentation structure is outstanding since the above analysis revealed the most particular patterns and the highest diversity in their argumentation. One of the peculiarities of their argumentative structure, the negation, is also present at one of the most recently founded firms: Zeta-Tech. However, for Zeta-Tech, the impact of the negation is lower: while at Alpha-Tech, numerous business opportunities for its core business are eliminated, at Zeta-Tech it is only one dimension that is eliminated by the reference to the analogy, i.e., payroll.

In the argumentation of their core businesses, Alpha-Tech and Beta-Tech demonstrated a convincingly concise style and versatility when being challenged with inconsistencies and asked for implicit assumption or compatibility of values. I identified higher diversity of argumentation patterns for these two firms founded in the ’80s as compared with the remaining firms in the sample.

However, all firms show interesting forms of argumentation. For better understanding of the patterns in the firms’ argumentation, I investigated the evolution of the most dominant arguments or logic contained in the cognitive maps over time.

### 4.3 Evolution of Cognitive Maps

I use the conceptualization of coherence as developed in the theory part and its operationalization as established in the methodology section for revealing the evolutionary patterns of the cognitive maps. The centrality score determines the prominence of a node in the network by the number of ingoing and outgoing links to a concept weighted with the length of respective path (Bougon et al., 1977). The domain score refers to the crucial positions in the causal chains related to explications and consequences (Eden et al., 1992; Cossette, 2004). Finally, cluster analysis helps to
identify groups of concepts that are relatively isolated within the entire structure of the cognitive map (Eden et al., 1992).

In order to avoid bias in the representation, when the variables were the same I did not include overlapping concepts in my analysis. Specifically, I included the three concepts with the highest domain score for developing the analysis. In the case of Beta-Tech, however, the variables overlap, e.g., ‘technological innovation’ and ‘trust’ are the most prevalent variables in the map at t1 and at t2. A way to solve these issues would have been to include the next most important variables of the map at t2 and, by doing this, also obtain nine dimensions. However, this procedure might have led to distortion because comparability is unknown. Therefore, I decided not to include further variables in the case of overlap, which leads to some firms having fewer bars than others do. The reduced number of bars is to be interpreted as a strong sign of coherence.

4.3.1 Ventures founded in the 1980s

First, I refer to the evolution of the most dominant concepts in the cognitive maps at Alpha-Tech and Beta-Tech.
### 4.3.1.1 Alpha-Tech

<table>
<thead>
<tr>
<th>Alpha-Tech: Map n=year</th>
<th>Centrality (score)</th>
<th>Domain (number of links around)</th>
<th>Cluster(s)</th>
</tr>
</thead>
</table>

Table 3: Overview of Scores at Alpha-Tech

‘Quality of software engineering’ is clearly the most prevalent variable in Alpha-Tech’s map at $t_1$. The importance of software engineering as a core competence remains highly prominent in Alpha-Tech’s maps over time. The connotation of software engineering is consistently positive or at least neutral (“That’s what we do,” Alpha-Tech). Interesting is that software engineering is less prominent in the map at $t_2$, which captures a moment where the economic situation is particularly tense. Therefore, the interviewee emphasizes variables linked to the execution of the projects and increase of efficiency rather than higher order goals such as the ‘quality of software engineering.’

In Alpha-Tech’s map at $t_3$, the CEO focuses on firm values and refocuses on ‘software engineering’ and ‘solv[ing] problems’. The connectivity between the latter two variables emphasizes that these activities are co-dependent: only the interaction of

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37 Centrality: number of ingoing and outgoing links to a concept weighted with the length of respective path (Bougon et al., 1977), resulting in a score between 0 and 1.
software engineering and the application for the customer, i.e., solving the customers’ problems, creates value. The results of the cluster analysis of the map at t₁ and t₃ confirm the preponderance of ‘software engineering’.

In sum, the CEO of Alpha-Tech maintains consistency of argumentation—for instance when claiming that software engineering is the most important—by generating familiarity with other variables of the argumentation constituting potential strategic moves. In the initial interview, the CEO of Alpha-Tech claims several financial transactions in which Alpha-Tech does not engage and several other activities, such as managing real estate, that are beyond Alpha-Tech’s focus. Nevertheless, Alpha-Tech eventually engages in the latter activities. That Alpha Tech’s discourse centers on ‘software engineering’ pushes aside arguments such as cost, administrative, and organizational issues.

Below, I present an illustration of the evolution of the most dominant concepts at Alpha-Tech over time

![Evolution of dominant concepts at Alpha-Tech](image)

Figure 6: Evolution of Dominant Concepts at Alpha-Tech
Most concepts in Figure 6 occur in all three observation periods. Central values, such as software engineering, are consistently referred to by the interviewee from Alpha-Tech. Despite this, cost is consistently an argument. Interestingly, Alpha-Tech does not want to engage in a discussion on cost. The CEO wants to picture his company as a fast and high-performing sports car rather than an efficiently functioning family car. At Alpha-Tech there are relatively central concepts such as ‘speed of decision’ and ‘quality of project’ that come up in specific discussions; however, it is not yet clear whether these parameters are maintained in further discussions.

In sum, high consistency of the evolution of concepts (evaluated only on the basis of the domain values of the cognitive maps) characterizes the argumentation at Alpha-Tech over time. This will become even more obvious when comparing Alpha-Tech with the remaining firms in the sample.

### 4.3.1.2 Beta-Tech

<table>
<thead>
<tr>
<th>Beta-Tech: Map n=year</th>
<th>Centrality (score)</th>
<th>Domain (number of links around)</th>
<th>Cluster(s) (number of variables)</th>
</tr>
</thead>
</table>
| Map 1=2004            | 1. Technological innovation (21/43)  
2. Trust (19/35)  
3. Reputation (18/37)  
4. Product demand (18/39)  
4. Sustainability (18/39)  
5. Customer orientation (17/38)  
6. Social competence (17/33) | 1. Trust (12)  
2. Technological innovation (8)  
3. Social competence (7)  
3. Sales (7)  
4. Product demand (6) | C1: Technological innovation (24)  
C2: Trust and social competence (17) |
| Map 2=2005/1          | 1. Sustainability (32/60)  
2. Trust (30/56)  
3. Technological innovation (27/53)  
4. Keeping track of the market (25/55) | 1. Trust (14)  
2. Sustainability (14)  
3. Technological innovation (12)  
4. Social competence (7)  
5. Sales (consulting) (7)  
6. Income return (7) | C1: Technological innovation (23) |
| Map 3=2005/2          | 1. Success of bodyleasing activities (9/14)  
2. Profit (8/17)  
3. Turnover (8/16)  
4. Knowledge of employees/consultants (8/15)  
5. Word to mouth (8/16)  
6. Sales (8/14) | 1. Success of bodyleasing activities (6)  
2. Sales (5)  
3. Success and purpose of an organization (4) | C1: Success and purpose of an organization (24)  
C2: Success of bodyleasing activities (12) |

Table 4: Overview of Scores at Beta-Tech

There are several variables consistently stated across all three periods of observation at Beta-Tech: ‘technological innovation,’ ‘trust’, ‘sustainability’, and ‘reliability’.
Also noteworthy is the change in the position of the variable in the causal chain. While ‘technological innovation’ and ‘trust’ are the most dominant variables in Beta-Tech’s map at t1, these two concepts function as explanations for ‘sustainability’ in the map at t2. The importance of ‘technological innovation’ is illustrated by the ratio of its input and output variables: whereas in the map at t1 this is ratio is 5:8, the ratio in the map at t2 is 6:5. In the map at t2, ‘sustainability’, ‘trust’, and ‘technological innovation’ are very tightly linked.

Moreover, the variable ‘technological innovation’ alternates between positive and negative connotation over the period of observation. Interestingly, the variable is consistently impeded by the external variables (i.e., environmental forces, governmental issues, political issues). The ambiguity that characterizes ‘technological innovation’ is reflected by implicit contradiction of variables explaining the variable, i.e., ‘stability’ and ‘flexibility’.

The most important variables in Beta-Tech’s maps are ‘technological innovation’, ‘sustainability’, and ‘body leasing’. As ‘technological innovation’ is at the very core of the firm’s mission, it not only constitutes a recurring variable in Beta-Tech’s maps, but is tightly linked with the other concepts of each map. The cluster analysis confirms the above suggestions of a coherence pattern within Beta-Tech. The last cluster of ‘success and purpose of an organization’ hints at the self-reflection of this organization. The high scores for ‘trust’ and ‘sustainability’ balance the dominance of technological innovation in an organizational context.

In sum, coherence of Beta-Tech’s argumentation structure is clearly oriented toward technological innovation and social values. Not only is the consistency over time of these variables very high, but the consistency across measures (centrality, domain, and cluster) is very high.
The continuity of all central concepts is striking when compared with the remaining firms in the sample. The discourse at Beta-Tech refers repeatedly to the central concepts of ‘technological innovation’, ‘social competence’, ‘sustainability’, and ‘sales’.

Beta-Tech earns the major part of its income through consulting services or body leasing. However, this is only possible due the authenticity of knowledge and experience that Beta-Tech gained in the past and the vision for a new version of its well-recognized product in the future. The above chart illustrates this high continuity of dominant concepts at Beta-Tech.

When compared to Alpha-Tech, the most outstanding difference in the cognitive maps at Beta-Tech is their consistency and high connectivity of concepts.

### 4.3.2 Ventures founded in the 1990s

In the following, I illustrate and comment on the evolution of the cognitive maps at Gamma-Tech and Delta-Tech, the two ventures founded in the 1990s.
4.3.2.1 Gamma-Tech

Gamma-Tech has been evolving into an efficiency-based business based on rational (sizable) decisions. The leaders of the company have emphasized the comprehensibility of decisions based on clear and quantifiable decision criteria.

<table>
<thead>
<tr>
<th>Gamma-Tech: Map n=year</th>
<th>Centrality (score)</th>
<th>Domain (number of links around)</th>
<th>Cluster(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Map 1=2004</td>
<td></td>
<td>1. Revenues (25/48)</td>
<td>C1: Breadth of offered services (23)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Sales (24/50)</td>
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<td>3. Specialisation on Obtree (14/33)</td>
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<td>4. Cross-Selling (15/36)</td>
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<td>1. Breadth of services (11)</td>
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<td>2. Revenues (10)</td>
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<td>3. Sales (9)</td>
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<td>4. Customer satisfaction (6)</td>
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<td>5. Responsibility of employees (5)</td>
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<td>5. Specialisation (5)</td>
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<td>5. Size of organization (5)</td>
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<td>5. Specialisation on Obtree (5)</td>
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<tr>
<td>Map 2=2005/1</td>
<td></td>
<td>1. SBU structure (37/59)</td>
<td>C1: SBU structure (21)</td>
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<td></td>
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<td>2. Multiplication (27/52)</td>
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<td>3. Standardization (13/46)</td>
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<td>4. Economic situation (22/46)</td>
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<td>5. Modularization (22/43)</td>
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<td>1. SBU structure (21)</td>
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<td>2. Multiplicator (10)</td>
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<td>3. Size of company (8)</td>
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<td>4. Standardization (7)</td>
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<td>5. EBIT (7)</td>
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<td>6. Efficiency of employees (7)</td>
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<td>7. Market price (7)</td>
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<tr>
<td>Map 3=2005/2</td>
<td></td>
<td>1. Customer satisfaction (14/28)</td>
<td>C1: Stability (19)</td>
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<td></td>
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<td>2. Customer value (13/28)</td>
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<td>3. Industry groups (13/21)</td>
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<td>4. Turnover (9/21)</td>
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<td>5. Stability (9/14)</td>
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<td>6. Reliability (9/20)</td>
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<td>7. Recess (9/20)</td>
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<td>8. Speed of project execution (9/20)</td>
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<td>1. Industry groups (9)</td>
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<td>2. Stability (7)</td>
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<td></td>
<td></td>
<td>3. Customer value (6)</td>
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<td></td>
<td></td>
<td>C2: Industry groups (26)</td>
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Table 5: Overview of Scores at Gamma-Tech

My studies capture decisive developments at Gamma-Tech from setting the objective of being the largest privately-owned internet service provider in Switzerland. During this development, Gamma-Tech experienced the retention of the prevailing logic, i.e., business logic, which prevails over creative/design logic and technology-based logic.

Gamma-Tech is a particularly interesting case due to the merger and two ex-consultants being in management. Gamma-Tech underwent a lively competition of thinking patterns among disciplines and of general assumptions held by members of the management and employees.

In 2004 Gamma-Tech concentrated on the definition of its core business as Enterprise Content Management on the one hand (‘breadth of services’) and output-measures (‘revenues’ and ‘sales’) on the other. A debate on the breadth of services offered at
Gamma-Tech is tentatively settled. Gamma-Tech identifies its product as internet services, i.e., Enterprise Content Management (ECM). That by far the most prominent cluster is on ‘breadth of service’ indicates the need for a clearer definition of the core business activity.

In the map at t2, ‘Strategic Business Unit Structuring’ clearly constitutes the most important variable and represents a major internal strategic action in order to improve the firm’s efficiency and effectiveness when competition increases. The management replicated one particularly successful business unit across the company, which resulted in substantial change of Gamma-Tech’s organizational structure. More precisely, the firm’s leadership introduced a second management layer.

Whereas the results analyses of domain and clustering of the two first maps, i.e., ‘breadth of services’ and ‘strategic business unit structuring,’ confirm the coherence of argumentation at Gamma-Tech, there is substantial variation between the different analyses in the third phase of observation. Here, the argumentation refers to several variables that start to be important, i.e., stability, reliability, and industry groups, and the argumentation is linked between customer-related variables such as ‘customer satisfaction’ and the objective “customer gets in three years double as much.” Gamma-Tech’s CEO clearly identifies ‘sustainability’ and ‘reliability’ as the firm’s main objectives at t3. The latter concepts convey a consolidation of the previously attained growth of Gamma-Tech. The prevalence of these concepts reflects the perspective of the former CEO and co-founder of Gamma-Tech, who left the firm in June 2006.
While two of the three most central variables at Gamma-Tech (‘strategic business unit structuring’ and ‘industry groups’) are single data points, one is a continuous line over two periods (‘breadth of service’).

The remaining variables come up in the argumentation of the strategy at Gamma-Tech, but are not continuous. When compared with the above firms, the discontinuity of concepts at Gamma-Tech is striking. Rather than one single concept, Gamma-Tech develops several characteristics defining its business over the three periods of observation.
4.3.2.2 Delta-Tech

<table>
<thead>
<tr>
<th>Delta-Tech (Map n/year)</th>
<th>Centrality (score)</th>
<th>Domain (number of links around)</th>
<th>Cluster(s)</th>
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<tr>
<td>Map 1=2004</td>
<td></td>
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<tr>
<td>2. ROI (19/37)</td>
<td>2. Size of customer base (11)</td>
<td>C2: Saturation of the German library market (3)</td>
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<tr>
<td>3. Customer satisfaction (18/31)</td>
<td>3. ROI, employee motivation (6)</td>
<td>C3: Sales (3)</td>
<td></td>
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<tr>
<td>4. Sales (17/35)</td>
<td>4. Sales (5)</td>
<td></td>
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<tr>
<td>5. Quality of customer relationship (16/35)</td>
<td>5. Demand (14/35)</td>
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<td>6. Cost (15/35)</td>
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<tr>
<td>Map 2=2005/1</td>
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<td></td>
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<tr>
<td>2. Success (14/31)</td>
<td>2. Customer satisfaction (7)</td>
<td>C2: Sales (6)</td>
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<tr>
<td>3. Profit (14/29)</td>
<td>3. Recognition of the market trend in the 10 years</td>
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<tr>
<td>4. Sales (13/21)</td>
<td>4. Technological innovation (5)</td>
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<tr>
<td>5. Feedback (12/26)</td>
<td>5. Employee motivation (5)</td>
<td></td>
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<tr>
<td>Map 3=2005/2</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>1. Integration with Tech-Co1 (30/39)</td>
<td>1. Integration with TechCo1 (21)</td>
<td>C1: Integration with TechCo1 (41)</td>
<td></td>
</tr>
<tr>
<td>2. New product in portfolio (19/38)</td>
<td>2. Acquisition UK firm (9)</td>
<td>C2: Economic execution of customers’ goals (41)</td>
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</tr>
<tr>
<td>3. Revenues in existing markets (19/38)</td>
<td>3. Economic execution of customers’ goals (7)</td>
<td></td>
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<td>4. Integration of financial systems (19/38)</td>
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<td>5. Integration of technological infrastructure (19/38)</td>
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<td>6. Local presence in core markets (19/38)</td>
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<td>7. Development capability (19/38)</td>
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Table 6: Overview of Scores at Delta-Tech

Most striking in the above table is the dominance of the ‘integration with Tech-Co1’ in the third observation phase. The concepts directly related to this variable are understandably dominant, given that the interview was done only a few months after the official acquisition in July 2005.

However, over time the most dominant are customer-related concepts such as ‘number of customers’, ‘customer satisfaction’, or ‘customer orientation’. The analysis of domain and clustering confirms this: the dominance of customer-related variables.

The most important variable in Delta-Tech’s map at t₁ is ‘size of customer base’. The variables influencing ‘size of customer base’ are ‘openness’, ‘seriousness’, ‘reliability’, and ‘creativity’. These abstract terms in the argumentation of Delta-Tech are used as a means for ‘customer satisfaction’, which in turn leads to an increase in ‘number of customers’.

The ultimate factors responsible for the ‘size of customer base’ are ‘quality of team work’, ‘qualification of personnel’, ‘creativity’, ‘financial possibility through
prefinancing’ (through Tech-Co₂), and ‘breadth of service’. All these concepts apply to human resources or product and therefore to the persistent philosophy of Delta-Tech. Therefore, the argumentation is clearly from inside to the outside because the internal values of Delta-Tech enable the firm to serve its customers best.

In Delta-Tech’s map at t₂ the customer-related variables repeatedly dominate, but to a lesser extent than in the first interview. The variables leading to ‘customer satisfaction’ are ‘utility for the customer’, ‘technological innovation’, ‘aesthetics’, ‘quality’, and ‘price’.

Technological innovation is one explanatory variable for ‘customer satisfaction’. However, the ultimate reasons and explanations leading to customer satisfaction in the map at t₂ of Delta-Tech are linked to technology, i.e., ‘investment in technological development’ and ‘Linux’.

The technological competence of Delta-Tech is highly internalized; however, the eventual reasons for the argumentation of the most central variables make evident that Delta-Tech defines itself by its technological competence. Technology is natural at Delta-Tech, as well as the library knowledge and the customer orientation (the neutral term for customer satisfaction).

The dominance of customer-related variables is maintained at Delta-Tech in the map at t₃, but more subtly due to the above-explained prevalence of the highly recent and strategic integration with Tech-Co₁. The more neutral concept of ‘customer orientation’ clearly illustrates the continued dominance of the customer-focus at Delta-Tech. The variables explaining ‘customer orientation’ are different from the previous ones, i.e., ‘technological competence’, ‘library competence’, ‘optimized project management’, ‘excellent organization and consulting’, ‘consistency of service concept’, and ‘innovation capability’.
In the map at t_3, there is a direct linkage of ‘technological competence’ to ‘customer satisfaction’. A possible explanation for this tighter coupling of these concepts could be that the dominant partner (Tech-Co_1) is a technology corporation. This causality, which was rather implicit in Delta-Tech in the previous analysis, has become explicit over time due to highly frequent negotiation of objectives and values with the rather technologically-oriented partner Tech-Co_1 during the integration process.

The ultimate explanations given for ‘customer orientation’ of the map at t_3 are ‘innovation capability’, ‘competences’, and ‘consistency’. Consistency over time is an argument that can, per definition, only arise from the causality with previous concepts.

With the integration with Tech-Co_1, ‘customer satisfaction’ is transformed into ‘customer orientation’, which is less clear, more readily contested, and harder to measure. Several statements show the continued importance of the customer: “Well, the decision for the technology was secondary. That was mainly motivated by the customer; it originated from a necessity of the application” (Delta-Tech).

However, the analysis of the map of Delta-Tech at different points in time shows that technological innovation and technological competence are prevalent.

A possible explanation for the conundrum could be that the technological innovation is taken for granted and therefore not addressed in the argumentation. When Delta-Tech merges with a new, highly technologically-oriented corporation, the issue is discussed and hence not only is it more explicit in the cognitive maps of t_3, but also the causality is direct rather than indirect as in the previous maps.

The position of the central variables in the argumentation process at Delta-Tech remains stable over time: ‘technological innovation’ is always an explanation for ‘customer orientation’ or ‘customer satisfaction’. In other words, the customer-related variables remain the objectives and technology-related variables remain the means to reach them. After the integration of Delta-Tech and Tech-Co_1, ‘technology’ and ‘cost
awareness’ have gained importance. In Delta-Tech’s map at t3, customer orientation is associated with economic execution of customers’ goals.

Furthermore, the emphasis is on ‘usability’ as a variable connecting ‘customer orientation’ with ‘technological innovation’ or competence:

“Well, usability is certainly one, but I don’t believe it is that important to see what the task of the customer is, what the customer does. Usability always means to internalize the business. But what the business means for different people. If I were at the counter, would I be interested in what an exciting database this is? Not at all. It is not interesting to me. At the counter, everything has to simply function. Why it functions, that does not matter” (Delta-Tech).

Despite a major merger and an acquisition, there is relatively little change in the concepts behind the maps at Delta-Tech. The reason for this may be the particular homogeneity in the library market as a niche market. Another explanation may be very careful selection for the merger.

Figure 9: Evolution of Dominant Concepts at Delta-Tech
‘Customer satisfaction/orientation’ presents the single most important variable at Delta-Tech over time. At \( t_3 \) there is the incident of the M&A activities that attract much attention in the maps. Nevertheless, ‘customer satisfaction’, ‘RoI’, and ‘sales’ are consistently discussed at Delta-Tech.

### 4.3.3 Ventures founded since 2000

Finally, I discuss the evolution of the dominant concepts contained in the cognitive maps at Epsilon-Tech and Zeta-Tech.

#### 4.3.3.1 Epsilon-Tech

<table>
<thead>
<tr>
<th>Epsilon-Tech (Map n=year)</th>
<th>Centrality (score)</th>
<th>Domain (number of links around)</th>
<th>Cluster(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Map 1=2004</td>
<td></td>
<td>1. Adaptiveness to the environment (23/44)</td>
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<td>2. Innovation (21/44)</td>
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<td>3. Performance of strategy process (17/33)</td>
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<td>4. Delay (14/33)</td>
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<td>5. Project organization (13/28)</td>
<td></td>
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<tr>
<td>Map 2=2005/1</td>
<td></td>
<td>1. Sales (7)</td>
<td>C1: Characteristics of employees (fear/performance-driven) (5)</td>
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<td></td>
<td></td>
<td>2. 100 million dollar growth in 3 years (13/20)</td>
<td>C2: Cost of innovation (5)</td>
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<td>3. Quality of partnership (11/22)</td>
<td>C3: Number of medium-sized firms (4)</td>
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<td></td>
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<td>4. Consistency of vision (10/19)</td>
<td>C4: Quality of customers (4)</td>
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<td>5. Liquidity/Cash flow (10/19)</td>
<td>C5: Awareness of customers (3)</td>
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<td>6. Motivation of employees (9/20)</td>
<td>C6: Struggle (3)</td>
</tr>
<tr>
<td>Map 3=2005/2</td>
<td></td>
<td>1. (Number of) acquisitions (11/20)</td>
<td>C1: (Number of) acquisitions (20)</td>
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<td></td>
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<td>2. Consolidation of the organization (10/19)</td>
<td>C2: Ease of sales of ILM (10)</td>
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<td></td>
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<td>3. Amount of software in the industry (9/18)</td>
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<td>4. Profit (8/15)</td>
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<td>5. ASP platform (8/14)</td>
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<td></td>
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<td>6. Consolidation of organization (4)</td>
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Table 7: Overview of Scores at Epsilon-Tech

The length of the causal chains used for explanation at Epsilon-Tech varies substantially over time. Initially, the number of arguments is very high, though their interlinkage in the network is very limited. In the map at \( t_3 \), the number of reasons is much lower, and their interlinkages with the remaining network are much lower. This could be seen as an indicator that the reasoning at Epsilon-Tech became more consolidated.
One of the most outstanding causal chains is the argumentation for Epsilon-Tech’s core business in 10 years’ time. This is reflected by the high domain score of the variables, which in turn shows a long chain of reasoning.

In the map at t₁, acquisition is a strategic action among others in order to reach the objective of ‘adaptiveness’. In the map at t₃, the CEO of Epsilon-Tech realized that acquisition capability constitutes a unique capability or core competence at Epsilon-Tech. Therefore, Epsilon-Tech managed to convert ‘acquisition activity’ from a sporadic strategic activity to a (core) competence. The following quotations of the interviews at t₁, t₂, and t₃ illustrate this process:
“Well, the last two acquisitions that we realized took two weeks. We had two weeks to build due diligence in the entire organization. You can’t do that in a traditional company, we are incredibly fast” (Epsilon-Tech).

Figure 10: Cognitive Map of Epsilon-Tech at t1
“Worldwide, there are three [competitors] that are larger than we are, but we grow faster because we buy organizations. If we continue working hard, then we may be able to occupy a [market] segment. And that is very good in this field [real estate]: when the segment is occupied, nobody can take it away from you. Well, it’s better to occupy with little turnover a small area than to occupy a larger area somewhere in the world that can be taken away more easily. If we did semiconductors or automotive - those are very large territories - then we would gain a few customers. But, all of a sudden there is someone who does exactly the same thing and he takes away your position. In real estate, this can’t happen to us” (Epsilon-Tech).

Figure 11: Cognitive Map of Epsilon-Tech at t2
(3) Interview - Map t₃

“For us it always worked very well, and then at some point we realized that it may be our core competence to manage companies. We have a very absorptive organizational structure, we have a relatively broad management team, and we have clear instruments for leadership. I think as an organization we are better than the market permits. That may also be due to the limits of the real estate market” (Epsilon-Tech).

Figure 12: Cognitive Map of Epsilon-Tech at t
A core competence of ‘managing organizations’ may have developed for Epsilon-Tech due to the particular situation in the real estate market. Therefore, one could also think that the conviction of Epsilon-Tech to stay in this market could be the driver for acquisitions.

Interestingly, the firm is coming again to its original business plan, which was to establish an ASP platform. In the meantime, Epsilon-Tech had to build in-house consulting expertise, but the partners were not particularly interested in having a consulting firm; rather they needed the consulting firm to reach their eventual objectives. Understanding to what extent the development of an ASP platform for Epsilon-Tech was connected to real estate may help reveal the logic at play at Epsilon-Tech.

In general, in Epsilon-Tech’s map at t1 the most central concept is ‘adaptiveness’. This concept is implied by the following: ‘composition of the competences of management’, ‘efficiency at handling feedback’, ‘priorization of feedback’, ‘clarity of guiding principles’, ‘delay’, ‘innovation’, ‘performance of strategic process’, ‘restructuring’, and ‘freedom of action for the partners’.

In the map at t2, the most prominent concept is ‘100 million dollar growth in three years’. This concept is explained by ‘speed’, ‘commonality’, ‘orientation’, ‘genetic code’, ‘vision’, ‘breadth of strategic space’, and ‘motivation of employees’.

An explanation for less attention being paid to the variable of ‘adaptiveness’ in the map at t3 could be that Epsilon-Tech is already a major player in its segment in the German-speaking real estate software market, so there is no longer a need to adapt rather than to drive the market place. Acquisitions have developed from a strategic action among characteristics of the firm (e.g., project organization, true partnership) to the core competence at Epsilon-Tech.
Domain and cluster analyses of Epsilon-Tech’s maps confirm this observation. Conjoined, these analyses illustrate very well the evolution of the central concepts at Epsilon-Tech. While adaptiveness is very important in the beginning, ILM and acquisition become important later.

Figure 13: Evolution of Dominant Concepts at Epsilon-Tech

Several concepts are consistently of high importance at Epsilon-Tech. While the important variables (on the domain measure) for the first two interviews are single data points, it becomes clear how ‘(number of) acquisitions’ is a concept that extends through the entire graph. Acquisitions gain the highest importance in the map at $t_3$, which coincides with time when acquisitions are no longer a strategic action but have been transformed into a core competence.

4.3.3.2 Zeta-Tech

Zeta-Tech’s maps stand out by their sheer number of explanations and consequences for certain central variables, such as “simplicity.” The maps are even more outstanding when considering the diversity in justification types of the variables.
At Zeta-Tech, I observed a particular change in the exploration and the emergence of a clear ideology of the firm. Since this process constitutes a particular curiosity I describe the process in more detail.

<table>
<thead>
<tr>
<th>Zeta-Tech (Map n=year)</th>
<th>Centrality (score)</th>
<th>Domain (number of links around)</th>
<th>Cluster(s)</th>
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<tbody>
<tr>
<td>Map 1=2004</td>
<td>1. Sales (14/26)</td>
<td>1. Sales (7)</td>
<td>C1: Sales (19)</td>
</tr>
<tr>
<td></td>
<td>2. Revenues (13/25)</td>
<td>2. Number of customers (6)</td>
<td>C2: Demand of product (5)</td>
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<td></td>
<td>3. Number of customers (13/25)</td>
<td>3. Revenues (5)</td>
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<td></td>
<td>4. Quality (9/19)</td>
<td>4. Customers satisfaction (5)</td>
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<td></td>
<td>5. Firm size (9/18)</td>
<td>5. Firm size of customers (4)</td>
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<td></td>
<td>6. Profit (9/20)</td>
<td>6. Economic situation (4)</td>
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<tr>
<td>Map 2=2005/1</td>
<td>1. Simplicity (14/17)</td>
<td>1. Overall quality (9)</td>
<td>C1: Customer satisfaction (17)</td>
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<td>2. Customer satisfaction (11/17)</td>
<td>2. Simplicity (9)</td>
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<td>3. Core competence (9/16)</td>
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<td>4. Number of customers (9/19)</td>
<td>4. Efficiency at work (8)</td>
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<td>5. Overall quality (9/9)</td>
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<td>2. Standard product (15/21)</td>
<td>2. Turnover (7)</td>
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<td>5. Focus on needs of end-user (11/24)</td>
<td>5. Growth 2004 (11/19)</td>
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<td></td>
<td>6. Growth 2004 (11/19)</td>
<td></td>
<td>C3: Customer satisfaction (9) (3x means, 1x end)</td>
</tr>
</tbody>
</table>

Table 8: Overview of Scores at Zeta-Tech

At Zeta-Tech, the output-oriented variables are consistently important in the maps. Among all measures, ‘sales’ is the most important variable in the map at t1. In the map at t2 the most important variable is ‘simplicity’. At t3 the idea of developing a standard product starts to prevail. The cluster analysis hints that the argumentation is far-reaching and well-connected. We observe a similar connectedness of variables at Beta-Tech, where it is clearly most emphasized among all firms in this sample. In the following, I discuss the evolution of the maps at Zeta-Tech in more detail.
(1) Cognitive Map of Zeta-Tech at $t_1$

Figure 14: Cognitive Map of Zeta-Tech at $t_1$
(2) Cognitive Map of Zeta-Tech at t_2

Figure 15: Cognitive Map of Zeta-Tech at t_2
“The person who designed this solution for us is very good at user guidance. He struggled very much until being able to convince others [in our company] of his ideas and his thoughts. And then he discussed these with them. And then we saw for the first time why they were liked” (Zeta-Tech).

The intense struggle for internal legitimacy of ‘simplicity’ at Zeta-Tech led to a more elaborate system of reasons in favor of the concept.
The original technology at Zeta-Tech was ‘matching and profiling technology’. A conversation with the CEO of Pixel Park led to the awareness and the eventual retention. From then on, Zeta-Tech identified itself with matching and profiling technology. However, one employee—after having worked in another field for a while—returned to a project based on matching and profiling and put forth a fundamental critique on the technology:

“Recently, we had a session on the topic of application management because we match applicants’ management with structured goals. For a while, we had no good feelings about that. That is simply because you realize that you cannot have it run the way you want. This requires a lot of overhead, a high amount of expenses, and many applicants. Many issues, many principles, and we were convinced that profiling and matching was very important and so forth. Moreover, we had mediocre feelings concerning many different issues. Matching and profiling did not work as it was supposed to work. Simplicity as concept, for instance, is very clear, it meets the market demand, people understand it, and these are really reasons why people buy” (Zeta-Tech).

The CEO of Zeta-Tech had been reflecting on the concept of simplicity for a long time. This ongoing process is reflected by the fact that the concept of ‘simplicity’ is contained in the map at t₁, but is does not appear in the analysis of the dominant concepts because it was not yet central in the argumentation at t₁. Back then, ‘simplicity’ was simply a characteristic of the product. Eventually, as a reaction to open criticism of ‘matching and profiling’, the latter technology was replaced by another technological approach based on the principle of simplicity.

Simplicity as concept may derive part of its strength from its ambiguity in general, and in the evolution at Zeta-Tech in particular. At first, the employees at Zeta-Tech viewed the simple character of the first software tool as negative: simplistic. Over time, it was internally legitimized. Once the employees were convinced of the value of
simplicity, their conviction led to powerful discourses with the customer and eventually an acceptance in the marketplace. Therefore, it is a differentiating characteristic of Zeta-Tech today. In other words, the transformation of the concept of simplicity at Zeta-Tech changed from an *individual concept* to a *collective concept*, from an *internally legitimized* concept to an *externally legitimized* concept. In addition, Zeta-Tech managed to convert the *negative connotation* that may be associated with simplicity to a *positive connotation*. Finally, Zeta-Tech shifted the concept of simplicity *from a characteristic of the software product to an ideology of the firm*.

This emergence of simplicity as the most central concept for Zeta-Tech’s reasoning about its core business goes along with a tremendous increase in explanations and consequences of the concept within the map at t₂. Whereas the consequences of simplicity are well interlinked with the remaining concepts in the map, the explanations are relatively short chains of reasoning, usually only one variable that is not very tightly interconnected. This may be interpreted as a sign of the ongoing evolution of the concept toward dominance. On the other hand, it may be an indicator for ‘competition for attention’ (Von Krogh and Grand, 2000) within Zeta-Tech. Therefore, the nature of the reasons leading to simplicity is varied. In other words, there is a high variety of justification patterns at play in the argumentation at Zeta-Tech. It can be seen that there are linkages back in the argumentation to previous statements.

The initial statement of ‘no payroll’ as defining the core business at Zeta-Tech is now linked to the concept of simplicity. Simplicity is one more element supporting ‘no payroll’, as the complexity of different tax systems adapted for each country would contradict the principle of simplicity. Interestingly, in the map at t₃, the concept of simplicity does not increase in importance, yet there is a decrease in overall importance in the map at t₃.
There are several concepts that consistently occupy the minds of the dominant coalition (i.e., ‘simplicity’, ‘efficiency at work’, ‘revenues’, ‘growth’). One issue that emerges in the discussion over time is the ‘standard product’. To an extent, simplicity, the ideological orientation of the firm, came up at about the same time as standard product. The remaining concepts contained in the maps of Zeta-Tech are clearly output-oriented and are consistently depicted by the maps. The number of variables (8 instead of 9) and the continuous lines of several variables (‘simplicity’, ‘revenues’, ‘growth’), and several continuous discussions (‘standard product’, ‘customer satisfaction’, ‘sales’), show continuity in the evolution of concepts at Zeta-Tech.

Epsilon-Tech and Zeta-Tech both formed outstanding concepts of their identity during the two-year observation period. In both cases, the identifying concept (‘acquisition capability’ for Epsilon-Tech, ‘simplicity’ for Zeta-Tech) was contained in all three maps of the respective firm. However, those concepts are rather unobtrusive for the central argumentation in the initial maps of Epsilon-Tech and Zeta-Tech. While ‘acquisition’ as a core competence becomes central only in Epsilon-Tech’s map at t₃, ‘simplicity’ clearly dominates already in the map at t₂ at Zeta-Tech. In Zeta-Tech’s map at t₃ the concept of ‘simplicity’ remains highly influential, for the reasoning
becomes internalized and reified in the strategic action. In other words, ‘simplicity’ best describes Zeta-Tech’s approach to business in general and the development of a standard product in particular.

4.3.4 Summary

Concerning their consistency or continuity of concepts, the most outstanding firms are the ones founded in the ’80s. The extreme continuity of concepts and consistency over time of Beta-Tech is especially noteworthy. Discontinuity of the cognitive maps is most prevalent in Epsilon-Tech, where concepts frequently appear only in one of the maps. As illustrated above, the two firms founded since 2000 reveal concepts that reach very high importance in the maps at t₂ (Zeta-Tech: ‘simplicity’) and t₃ (Epsilon-Tech: ‘acquisition competence’).
4.4 Types of Justification and Their Evolution

While the previous chapter elicited the most prominent concepts of the maps and their evolution, this chapter focuses on characterizing the justification patterns of the two firms that are compared here, i.e., Alpha-Tech and Beta-Tech, in order to subsequently compare the patterns of the evolution in justification patterns across the six firms.

More precisely, I analyze the justification patterns of the core variables that have been identified in the previous chapter, i.e., (1) Elaboration of Justification, (2) Internal versus External Justification, and (3) Justification by Temporality versus Justification by Generality.

Given the positioning of this study as comparative-analytic descriptive rather than prescriptive or normative, the ultimate justification is an indicator of equivalent strategies, not as a confirmation or refutation of strategy. Due to the diversity of these strategies, however, I need to analyze relatively diverse approaches in one category with a common purpose, i.e., to legitimize the respective causal chain. In other words, I characterize the warrant, on which the interviewees’ argument relies, according to the above-mentioned three dimensions.

In the following, I analyze the most central variables for each company, and I draw on all explanations for these specific variables contained in the maps. For these explanations, I look at the causal chains. I analyze the causal chains through the centrality value. Specifically, I identify the variable that stands out for the most complex and elaborate justification. Then, I investigate the explanations that are given for that variable, again for their justification.
I first focus on the elaboration of justification through a quantitative measure, and then I attend to the more fine-grained content-related typologies, which constitute the most fine-grained differentiation possible given this study’s comparative and longitudinal nature.

4.4.1 Ventures founded in the 1980s

First, I analyze the justification process at Alpha-Tech and Beta-Tech along the above-mentioned three dimensions: (1) Elaboration of Justification, (2) Internal versus External Justification, and (3) Justification by Temporality versus Justification by Generality.

4.4.1.1 Alpha-Tech

Here, I present the results of the analysis of justification patterns at Alpha-Tech:

<table>
<thead>
<tr>
<th>Map 1=2004</th>
<th>Centrality (score)</th>
<th>Domain (number of links around)</th>
<th>Cluster(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. Quality of software engineering (14/30)</td>
<td>1. Quality of software engineering (9)</td>
<td>C1: Quality of software engineering (37)</td>
</tr>
<tr>
<td></td>
<td>2. Salary of software engineers (11/24)</td>
<td>2. Value-added for customer (11/21)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Cost of project (11/23)</td>
<td>3. Quality of software (5)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. Ratio of software engineering (11/25)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Map 2=2005/1</td>
<td>Centrality (score)</td>
<td>Domain (number of links around)</td>
<td>Cluster(s)</td>
</tr>
<tr>
<td></td>
<td>1. Cost (17/32)</td>
<td>1. Innovation (11)</td>
<td>C1: Innovation (28)</td>
</tr>
<tr>
<td></td>
<td>3. Quality of Projects (14/27)</td>
<td>3. Quality of projects (5)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Awareness of internal development (13/27)</td>
<td>4. Software engineering (4)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. Functioning of processes (12/25)</td>
<td>5. Reuse (4)</td>
<td></td>
</tr>
<tr>
<td>Map 3=2005/2</td>
<td>Centrality (score)</td>
<td>Domain (number of links around)</td>
<td>Cluster(s)</td>
</tr>
<tr>
<td></td>
<td>1. Success (15/26)</td>
<td>1. Success (9)</td>
<td>C1: Success (45)</td>
</tr>
<tr>
<td></td>
<td>2. Value (13/28)</td>
<td>2. Speed of decision (6)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Software engineering (11/19)</td>
<td>4. Project volumina (4)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. Investment (8/16)</td>
<td>5. High increase of employees (4)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6. (Temporary) profit maximization (9/18)</td>
<td>6. Cost (4)</td>
<td>C1: Success (45)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8. Cost of project (4)</td>
<td></td>
</tr>
</tbody>
</table>

Table 9: Evolution of Justification Patterns at Alpha-Tech

In the section on Generality versus Temporality, I distinguish Temporality further into past (P) and future (F).
1. Elaboration of Justification

The CEO of Alpha-Tech elaborates much along all the dimensions of argumentation. There is high consistency in the centrality values of the most important explanations of the three major concepts (‘software engineering’, ‘cost’, and ‘success’) over the cognitive maps.

2. Internal versus External Justification

Internal justification prevails at Alpha-Tech. Alpha-Tech presents itself as an innovator on a marketplace that is limited by only a few parameters. All justifications are internal (I), with one exception of an interaction effect (I+E).

Alpha-Tech takes for granted several external factors such as hourly pay for software development. Rather than discussing changing these variables or moderating their effect on Alpha-Tech’s core business, the CEO is interested in internal consistency in order to make up for changes in the wage situation. The CEO argues that Alpha-Tech shapes the market place, at least in the high-end sector in customized projects. Alpha-Tech intends to ensure that there is almost no way for the customer or the economic situation to interfere with the firm’s objectives. Therefore, Alpha-Tech frequently uses dominant strategies in dealing with customers and competitors.

3. Temporality of Justification versus Generalization of Justification

Generalization is a prevalent justification pattern at Alpha-Tech. In order to maintain the generality of argumentation, the CEO of Alpha-Tech accommodates counterfactual insights by generating new categories for these facts. For instance, the CEO emphasizes the stability of Alpha-Tech’s customer focus. While he refers to financial service providers as the main customers, he broadens the category by defining the targeted customer by company size, i.e., large companies.
### 4.4.1.2 Beta-Tech

Table 10 summarizes the values for the different concepts at Beta-Tech:

<table>
<thead>
<tr>
<th>Beta-Tech: Map n=year</th>
<th>Centrality (score)</th>
<th>Domain (number of links around)</th>
<th>Cluster(s) (number of variables)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Map 1=2004</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Technological innovation (21/43)</td>
<td>1. Trust (12)</td>
<td>C1: Technological innovation (24)</td>
</tr>
<tr>
<td></td>
<td>2. Trust (19/35)</td>
<td>2. Technological innovation (8)</td>
<td>C2: Trust and social competence (17)</td>
</tr>
<tr>
<td></td>
<td>3. Reputation (18/37)</td>
<td>3. Social competence (7)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Product demand (18/39)</td>
<td>4. Sales (7)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Sustainability (18/39)</td>
<td>4. Product demand (6)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. Customer orientation (17/38)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6. Social competence (17/33)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Map 2=2005/1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Sustainability (32/60)</td>
<td>1. Trust (14)</td>
<td>C1: Technological innovation (23)</td>
</tr>
<tr>
<td></td>
<td>2. Trust (30/56)</td>
<td>2. Sustainability (14)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Technological innovation (27/53)</td>
<td>3. Technological innovation (12)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Keeping track of the market (25/55)</td>
<td>4. Social competence (7)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. Sales (consulting) (7)</td>
<td>5. Sales (consulting) (7)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6. Income return (7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Map 3=2005/2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Success of bodyleasing activities (9/14)</td>
<td>1. Success of bodyleasing activities (6)</td>
<td>C1: Success and purpose of an organization (24)</td>
</tr>
<tr>
<td></td>
<td>2. Profit (8/17)</td>
<td>2. Sales (5)</td>
<td>C2: Success of bodyleasing activities (12)</td>
</tr>
<tr>
<td></td>
<td>3. Turnover (8/16)</td>
<td>3. Success and purpose of an organization (4)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Knowledge of employees/consultants (8/15)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. Word to mouth (8/16)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6. Sales (8/14)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 10: Evolution of Justification Patterns at Beta-Tech

#### 1. Elaboration of Justification

The causal chains in Beta-Tech’s cognitive maps imply that the reasoning in this firm is outstanding. The complexity of the map at t2 is startling. In order to determine the complexity of causal chains and their content, I realized that at Beta-Tech, almost all causal chains in the entire cognitive map at t2 is connected to ‘sustainability’, the most central concept of this map.

The interconnectedness among the variables is generally very high, but there are several peaks concerning this measure in the argumentation of Beta-Tech. Particularly noteworthy are the domain value for ‘trust’ in the map at t2 and the domain value for ‘growth’ in the map at t3.
2. Internal versus External Justification

Several central concepts at Beta-Tech are supported by external justification (e.g., quarterly-driven results, impact of Rappaport, political environment). An example of external justification is following discussion of crowding-out and buy-out:

“We started the initiative four weeks ago and concluded it one week ago. That is an automotive company. That is rather short term. At the moment, I think this is the best way to grow. Now, it is not that urgent to gain new customers, I believe. It is more important to squeeze competitors out of the market. It is rather obvious that this process of squeezing out competitors of the market is difficult. If there is a target firm for takeover, that’s obviously more comfortable than crowding out competitors” (Beta-Tech).

Technological innovation is also argued externally by the CEO’s explaining the impediments to technological innovation. For instance, he explains that finding partners for strategic alliances is difficult due to the quarterly-driven culture of the other corporations and other governmental influences.

3. Temporality of Justification versus Generality of Justification

The causal chains at Beta-Tech exhibited a mixture of references to the past and to the future. On the one hand, extremely innovative first-mover advantage is frequent, which is path-dependent for Beta-Tech. Beta-Tech intends to engage in new forms of organization related to Open Source development. On the other hand, Beta-Tech refrains from certain opportunities such as knowledge management, due to Beta-Tech’s identity, which is shaped by the technological competence reified by the major products of the firm that have been highly successful in the marketplace or that bear great potential for future developments.
In sum, Alpha-Tech and Beta-Tech show high consistency in their justification patterns: the CEOs of both firms rely predominantly on *internal justification patterns* and *justification by generality* rather than reference to past or future. The few arguments at Alpha-Tech and Beta-Tech that are characterized by temporality show that Alpha-Tech refers more frequently to the future. In contrast, the most central arguments of the CEO at Beta-Tech make reference to the past.

### 4.4.2 Ventures founded in the 1990s

Here, I compare Gamma-Tech and Delta-Tech along the illustrated dimensions of justification.

#### 4.4.2.1 Gamma-Tech

Table 11 shows the results of the analysis at Gamma-Tech:

<table>
<thead>
<tr>
<th>Gamma-Tech:</th>
<th>Centrality (score)</th>
<th>Domain (number of links around)</th>
<th>Cluster(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Map n=year</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Sales (24/50)</td>
<td>2. Revenues (10)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Specialisation on Obtree (14/33)</td>
<td>3. Sales (9)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Responsibility of employees (5)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Specialisation (5)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Size of organization (5)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Specialisation on Obtree (5)</td>
<td></td>
</tr>
<tr>
<td>Map 2=2005/1</td>
<td>1. SBU structure (37/59)</td>
<td>1. SBU structure (21)</td>
<td>C1: SBU structure (21)</td>
</tr>
<tr>
<td></td>
<td>2. Multiplication (27/52)</td>
<td>2. Multiplicator (10)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Standardization (13/46)</td>
<td>3. Size of company (6)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Economic situation (22/46)</td>
<td>4. Standardization (7)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. Modularization (22/43)</td>
<td>5. EBIT (7)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. Efficiency of employees (7)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>7. Market price (7)</td>
<td></td>
</tr>
<tr>
<td>Map 3=2005/2</td>
<td>1. Customer satisfaction (14/28)</td>
<td>1. Industry groups (9)</td>
<td>C1: Stability (19)</td>
</tr>
<tr>
<td></td>
<td>2. Customer value (13/28)</td>
<td>2. Stability (7)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Industry groups (13/21)</td>
<td>3. Customer value (6)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Turnover (9/21)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. Stability (9/14)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6. Reliability (9/20)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7. Revision (9/20)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8. Speed of project execution (9/20)</td>
<td>8. Speed of project execution (9/20)</td>
<td></td>
</tr>
</tbody>
</table>

Table 11: Evolution of Justification Patterns at Gamma-Tech

#### 1. Elaboration of Justification

While the justification of ‘sales’ in the map at t₁ is elaborate, the causal chains for the variables explaining ‘strategic business unit structuring’ are rather short. In Gamma-
Tech’s map at t₃, the justification of the variable ‘customer satisfaction’ is also relatively complex. In general, the justification at Gamma-Tech elaborates on more generic variables or constant variables such as ‘revenues’ and ‘customer satisfaction’.

2. Internal versus External justification

In the initial map at Gamma-Tech, external justification is slightly more frequent than internal justification. In the map at t₂, the most dominant concept is the implementation of a ‘strategic business unit structure’. The latter strategic decision obtained legitimacy through one particular success that propagated across the entire organization. Consequently, the justification is at least partially external because the data underlying the interpretation of the success is produced externally. In addition, the justification of business unit structuring is also based on reference to more general business concepts. Finally, ‘customer satisfaction’, the most dominant concept in the map at t₃, but very important across all three maps at Gamma-Tech, is once more an external justification. In general, external justification is outweighing internal justification in all three maps.

3. Temporality of Justification versus Generalization of Justification

At Gamma-Tech, justification by temporality is prevailing over justification by generalization. Exclusively when arguing for the relationship between ‘size’ and ‘revenues’ and that between ‘visibility on the marketplace’ and ‘revenues’, Gamma-Tech employs generalization. More precisely, reference is made to general assumptions, which legitimize the objective of being number one in Switzerland in terms of ‘size’ and ‘revenues’.

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4.4.2.2 Delta-Tech

Table 12 contains the results of the analysis of the justification patterns for Delta-Tech.

<table>
<thead>
<tr>
<th>Delta-Tech (Map n=year)</th>
<th>Centrality (score)</th>
<th>Domain (number of links around)</th>
<th>Cluster(s)</th>
</tr>
</thead>
</table>

Table 12: Evolution of Justification Patterns at Delta-Tech

1. Elaboration of Justification

Clearly the most elaborate arguments are customer-related. Very high scores on the elaboration of the argumentative structure have other variables such as ‘compatibility of NT solution’. While technological development is subordinated to customer needs, the score of elaboration of justification of technological development is relatively high.
2. Internal versus External Justification

A shift in Delta-Tech’s justification types reflects the substantial change in the company’s strategic positioning during this study’s observation period.

Strikingly, the CEO of Delta-Tech describes:

“Currently, we are the largest provider in Europe and through this merger we are number five worldwide. When compared to other competitors - which used to outrank us - we certainly have less development capacity. We do a great amount of solution-based business for our customers, representing a competitive advantage. The other issue is the strong local presence in this area in our core markets. And through the acquisition of a customer in the German market, we have a 70% market share of German customers in the academic market. […] We used to be a local player and now we are an international player. We used to be annoying, now we are dangerous” (Delta-Tech).

The latter statements illustrate a substantial shift in Delta-Tech’s identity. This is reflected by the reasoning concerning the rules or the industry recipe for the library market. While the limitations of this highly specialized market were emphasized in the first two interviews (see maps at t₁ and t₂), they are less explicit in the last interview (see map at t₃) because new possibilities of shaping this market and strategic action are considered.

Internal justification is based on resources that are currently in Delta-Tech’s possession. More than for other firms, the evaluation of opportunities at Delta-Tech relies entirely on existing resources and capabilities. Simply, the size of the firm after the M&A activities and the self-confidence of the newly created international firm indicate that the prevalent type of justification is internal.
In sum, the central concepts at Delta-Tech are predominantly *external* in the beginning of the observation period. Mainly due to the M&A activity, a *prevalence of internal justification* is discernable in the map at t₃.

3. Temporality of Justification versus Generality of Justification

Frequently, the discourse at Delta-Tech is linked to past experiences. The discourse is characterized by limited generalization. Only very few reasons hint to the future. The main activity that is definitely started in the future is the strategic acting in concert with the patterns.

Intentionally, the firm is rather reluctant when reflecting on new opportunities in the library market and the market for information portals. Numerous references are made to the firm’s longstanding experience in the library market, the technology, and customer relationships. This is reflected by the frequency of continuation of past actions.

Delta-Tech derives its value to a large extent from its longstanding history, customer relationships, and the experience of its employees. Solidity and reliability are particularly important values. However, innovativeness has also gained importance in recent developments.

During major changes, specifically independence from Tech-Co₂ and integration with Tech-Co₁, Delta-Tech values continuity rather than change. To conclude, the argumentation at Delta-Tech is characterized by continuity and reference to longstanding experience, traditions, and knowledge acquired over Delta-Tech’s years in the marketplace.

In summary, both firms have strongly developed argumentative structures for output-oriented and customer-related variables. Whereas Delta-Tech leads a discourse of continuity, Gamma-Tech adheres to a discourse of discontinuity. However, external
justification is prevalent at both firms. While at Delta-Tech internal justification
acquires some importance toward the end of the observation period, external
justification mainly legitimates the argumentation at Gamma-Tech. When it comes to
temporality versus generality of justification, both firms show a great number of
statements referring to the past, interspersed with a few general statements.

4.4.3 Ventures founded since 2000

In the following, I comparatively analyze the evolution of justification at Epsilon-
Tech and Zeta-Tech.

4.4.3.1 Epsilon-Tech

Table 13 shows the justification patterns at Epsilon-Tech over time:

<table>
<thead>
<tr>
<th>Epsilon-Tech: Map n</th>
<th>Central Concept</th>
<th>Causal Chain</th>
<th>Elaboration (=Centrality Score)</th>
<th>External (E)/Internal (I)/Interaction (E+I)</th>
<th>Generality (G)/Temporality (T)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Map 1: Adaptiveness to changing environment</td>
<td>Composition of the competences of management</td>
<td>0.4</td>
<td>I</td>
<td>T(P)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Efficiency of handling and prioritization of feedback</td>
<td>0.42</td>
<td>I</td>
<td>G</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clarity of guiding principles</td>
<td>0.4</td>
<td>I</td>
<td>G</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Delay</td>
<td>0.44</td>
<td>I</td>
<td>G</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Innovation</td>
<td>0.49</td>
<td>I</td>
<td>G</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Performance of strategy process</td>
<td>0.49</td>
<td>I</td>
<td>G</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Re-structuring</td>
<td>0.42</td>
<td>I</td>
<td>T(P)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Freedom of action for the partners</td>
<td>0.42</td>
<td>I</td>
<td>G</td>
<td></td>
</tr>
<tr>
<td>Map 2: 100 million dollar company</td>
<td>Speed</td>
<td>0.43</td>
<td>I+T</td>
<td>T(F)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cohesion</td>
<td>0.33</td>
<td>I+T</td>
<td>T(F)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Orientation</td>
<td>0.43</td>
<td>I+T</td>
<td>T(F)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Genetic code</td>
<td>0.43</td>
<td>I+T</td>
<td>T(F)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vision</td>
<td>0.43</td>
<td>I+T</td>
<td>T(F)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Breadth of strategic space</td>
<td>0.43</td>
<td>I+T</td>
<td>T(F)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Motivation of employees</td>
<td>0.45</td>
<td>I+T</td>
<td>T(F)</td>
<td></td>
</tr>
<tr>
<td>Map 3: (Number of) Acquisitions</td>
<td>Acquisition offer</td>
<td>0.5</td>
<td>I+T</td>
<td>T(P)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pricing</td>
<td>0.48</td>
<td>I</td>
<td>G</td>
<td></td>
</tr>
</tbody>
</table>

Table 13: Evolution of Justification Patterns at Epsilon-Tech

1. Elaboration of Justification

In general, the elaboration of the concepts in Epsilon’s maps at t₁ and t₃ is higher than
in its map at t₂. Particularly high is the elaboration of the causal chains for
‘adaptiveness to changing environment’. This argumentation is outstanding for
diversity of warrants underlying the reasons provided in the above table.
2. Internal versus External Justification

The above-stated superior elaboration in the map at $t_1$ and the map at $t_3$ predominates over the elaboration in the map at $t_2$.

The analysis of the maps at Epsilon-Tech shows that the first order explanations for the different concepts with the highest domain score are mainly internal explanations. Variables such as ‘efficiency of prioritization and handling’ or ‘motivation of employees’ are clearly internally justified concepts.

The only exception in these particularly dominant chains of reasoning at Epsilon-Tech is the concept of ‘succession problems in the real estate market’. This clearly externally motivated variable has a great impact on the most dominant variable, ‘number of acquisitions’.

3. Temporality versus Generality of Justification

Whereas generality of justification prevails in the map at $t_1$, the reference to the future for the concrete business objective dominates the map at $t_2$. For the low number of causal chains leading to ‘number of acquisitions’, it cannot be determined which mode of justification prevails in the map at $t_3$. Precise reference is made to the current situation in the real estate market - and therefore in the market for construction software - and a general statement is made concerning the relationship between pricing and number of acquisitions.

The few instances that I identified as reference to the past are reasons for the change at Epsilon-Tech. Therefore, it seems that there is no confirming or limiting reference to the past in any case.

4.4.3.2 Zeta-Tech

Table 14 shows the evolution of justification patterns at Zeta-Tech.
Table 14: Evolution of Justification Patterns at Zeta-Tech

1. Elaboration of Justification

The most central argument of the most central variable in the map at t2, ‘work load per user’, links the new technological concept with the previous technology, i.e., ‘matching and profiling technologies’. Hereby, the coherence of the entire argumentation is increased.

2. Internal versus External Justification

Zeta-Tech draws on many different forms of justification: internal, external, and their interaction. Particularly frequent in the explanations at Zeta-Tech, however, are the hybrids, i.e. the interaction between internal and external justification. This indicates that the interviewee clearly makes the connection between the conditions in the marketplace and the characteristics and processes in the firm. We may interpret that the firm managed to align its strategy very well with its environment, neither too dominant nor dominated by the remaining players in the market segment.

Furthermore, the interviewee at Zeta-Tech uses many highly diverse warrants in his discourse. The richness and diversity of explanatory variables concerning the concept
of simplicity is particularly surprising. One can consider this strength since Zeta-Tech is building a repertory of explanations.

3. Temporality versus Generality of Justification

‘Simplicity’, the central concept at Zeta-Tech, links the different temporal references: the origin of simplicity (past), the concept of simplicity (present), and intents based on the concept of simplicity (future). This reference across periods renders the concept of simplicity particularly powerful. When the dominant coalition reconsiders profiling and matching technologies, the concept of simplicity has already been well prepared.

In sum, the elaboration of argumentation at Zeta-Tech remains relatively stable. Therefore, no clear pattern is discernable. At Epsilon-Tech, in contrast, there is high elaboration in the first and last interviews. Interestingly, these peaks in elaboration of justification coincide with internal argumentation. The two firms differ substantially concerning their usage of internal and external justification: while internal justification predominates at Epsilon-Tech, external justification prevails at Zeta-Tech. Finally, the justification patterns of both firms show evidence of recurrence of temporality as well as generality, with Zeta-Tech relying more on temporality than generality.

4.4.4 Summary

The results of the justification patterns show that internal justification prevails at the older firms. However, at Epsilon-Tech, one of the youngest firms, internal justification dominates. Therefore, a generic pattern is absent.

Overall, the highest percentage of generalization is observed with the oldest firms. The lowest percentage of generalization is attributed to the middle firms. On the other hand, the younger firms refer to the past. For most of them, these single experiences have not yet been integrated into theories on how to operate. Here again, Epsilon-Tech constitutes an exception.
4.5 Comparison of Results with Strategic Inertia

As discussed in the literature review, strategic inertia or lack of strategic flexibility is a common characteristic that applies, to a certain degree, to all firms.

I analyzed the change in strategic action of the ventures along the following nine dimensions:39

- Marketing
- Personnel
- Financial structure
- Organizational structure
- External institutions
- Project/service
- Technological innovation
- Turnover
- Profit

These are relative measures: all nine dimensions along which I measure strategic inertia are rated on a 7-point scale, where 1 indicates no change and 7 indicates radical change. I captured the change for the entire observation period, from mid-2004 to the beginning of 2006.

Following the procedure for comparative case studies as outlined by Eisenhardt (1989a/91/2007), I refer to the comparison of the firms.

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39 Please see methodology section for further discussion of these measures.
4.5.1 Ventures founded in the 1980s

Figure 18: Comparison of Change Scores: Alpha-Tech -- Beta-Tech

Total Change Scores: 23 (Alpha-Tech); 17 (Beta-Tech)

The relation of change in strategic action illustrated in the above graph shows that Alpha-Tech is subject to more change than Beta-Tech is. The analysis revealed substantial change for both firms in personnel: both firms had a substantial increase of number of employees.40 While the extent of change of the two companies is similar, the strategies for increasing personnel differ: Beta-Tech acquired a firm in order to gain more access to the body leasing market. In contrast, Alpha-Tech increased its employees by 30% in recent developments due to the exploitation of a near-shoring opportunity in Hungary. This strategic move explains also the changes of Alpha-Tech in product/project and organizational structure.

Given that both firms rely on standardized processes for the project business and their technological innovation, there is little change to be observed. The dimension of

40 In both firms this is attributed to the second observation period.
marketing remains unchanged, too. The biggest difference between the firms is in their turnover. These are different strategies pursuing the same objective: growth. The routines that the firms generated in the project business and R&D remain stable.

### 4.5.2 Ventures founded in the 1990s

![Change scores at Gamma & Delta](image)

**Figure 19: Comparison of Change Scores: Delta-Tech -- Gamma-Tech**

Total Change Scores: 30 (Delta-Tech); 32 (Gamma-Tech)

While the largest change in Delta-Tech history fell into the period of observation, Gamma-Tech had undergone major change before the period of observation. The M&A activity that Delta-Tech realized recently leads to the change in financial structure. Given that Delta-Tech’s core business is in the library market, and mainly in the scientific branch of that market, it is subject to governmental regulations on budgeting and technological requirements at universities. Here again, major changes took place during the focal period (more precisely, during the second observation phase).
Gamma-Tech’s main objective in the focal period was growth. The success thereof is evident when considering the dimensions of personnel, turnover, and profit. In the first half of 2005, Gamma-Tech realized a major change in its organizational structure; more precisely, the firm implemented a business-unit structure. In addition, the firm made changes in the project business, namely intentions of a major quality improvement in order to attain the goal of rendering to the customer in three years, double the service available today.

While the change along the various dimensions of the two firms varies enormously, the total amplitude is comparable.

4.5.3 Ventures founded since 2000

![Change scores at Epsilon & Zeta](image)

Figure 20: Comparison of Change Scores: Epsilon-Tech - Zeta-Tech

Total Change Score: 24 (Epsilon-Tech); 22 (Zeta-Tech)

The most important change for Epsilon-Tech was in technological innovation. Through two major acquisitions, Epsilon-Tech increased the number of developers to
30, which is extraordinary in this firm’s target market - the real estate sector - taking into account the current firm size (100 employees). Clearly, product development was prioritized at Epsilon-Tech. The second major change at Epsilon-Tech is in its financial structure. Initially based on credit, the organization substantially simplified its financial structure and wrote off all its debts. The third most extensive change at Epsilon-Tech was related to external institutions, in particular the impact on the finance and construction markets in general.

At Zeta-Tech, the most extensive change took place along the dimension of personnel. The firm experienced fluctuation together with a substantial increase in personnel. The second major change at Zeta-Tech is in product/service and organizational structure. Zeta-Tech started to introduce a standard product and modified its organizational design by adding a hierarchical layer. In sum, both firms display substantial change; however, the dimensions along which the firms have changed vary.

4.5.4 Summary

The analysis of the change patterns across the six firms suggests that the causality between age and inertia is rather ambiguous: while there is evidence of inter-group comparability between the firms, the results are not clear-cut at all. A first explanation that comes to mind is the difference in internal, contextual and environmental conditions that these firms faced during the time they operated on the marketplace. Examples of internal changes at the firms are firm size, organizational structure, etc. While all firms are in the German-speaking software market, they are part of a certain sub-group within this industry. This means that the economic downturn and the situation in the software business affects the firms in a different way given their technological focus and customer focus.

However, the differences in group 1 (Alpha-Tech and Beta-Tech) and group 3 (Epsilon-Tech and Zeta-Tech) suggest - beyond the above mentioned internal, contextual and environmental differences - other influencing factors. This research
proposes that commonalities in patterns of the evolution of dominant logic and justification patterns or their co-evolution may yield additional explanatory potential for strategic inertia. In the following, I discuss the results of the study along these two latter additional explanatory variables.
5 Discussion of Results

In this section, I compare the insights of the above-discussed three dimensions of the evolution of dominant logic (argumentative structure, evolution of dominant concepts, and evolution of justification patterns) to the change in strategic action and formulate propositions based on this study’s results.

5.1 Argumentation Structure and Strategic Inertia

Regarding the change scores of strategy, the firms founded in the ’90s (Delta-Tech and Gamma-Tech) demonstrate the least strategic inertia, even less than the firms that have been founded more recently (Epsilon-Tech and Zeta-Tech).

In the analysis of its core business’s argumentation structure, Gamma-Tech, as the firm with the most changes in strategic action, exhibits one particularly eye-catching characteristic, i.e., reasoning by analogy. Whereas analogical reasoning is the most powerful form of reasoning in highly complex and ambiguous decision settings, this form of reasoning can be an insidious carrier of cognitive inertia (Gavetti, 1997).

The firms displaying the greatest number of examples of their argumentation structure in this sample are the ventures founded in the ’80s. Yet, their results on change of strategic action are heterogeneous. Focusing on the diversity of the two most mature firms in the sample reveals that the firms with the greatest diversity of topoi exhibit less change than do other firms with less diverse topoi.

Analytical reasoning - as opposed to reasoning by recurrence on topoi - is characterized by more explanatory variables in the causal chain and hence a higher degree of explicitness. Arguments that are explicit, are more accessible and hence can be revised more easily than if the elements are tightly coupled with each other (topoi). The reason lies in the salience of each construct; the more explicit the single elements
of causal chains, the easier it is to question the related arguments and disentangle them from the surrounding knowledge structure. For instance, when executives make analogies that originated in a personal preference that can no longer be recalled or that originated from an understanding of the company’s purpose, it may be hard to change their approach to their core business with changing environmental circumstances. However, if the company is very explicit about their reasoning of their core business, it may be easier to consider changing the orientation when certain reasons change or are no longer applicable. Beta-Tech, for instance, argues very explicitly why they adopted a certain technology and did not choose to sell software products. Once, a particular circumstance in the reasoning process changes, for instance, there are ways that you can develop products with less infrastructure or the necessary infrastructure becomes attainable to the company, then they can go back and adapt their chain of reasoning.

Within the great variety of topoi, there are topoi that can be disentangled with greater ease than others can. Greater diversity of topoi therefore leads to higher probability of encountering ones that are more rigid. These rigid topoi represent a highly implicit causality that is hardly accessible and therefore hard to change. This limits the firm’s potential for strategic change and hence leads to strategic inertia.

The above reasoning leads to the following proposition:

Proposition 1: Diversity of topoi in the argumentation of a firm’s core business is positively associated with strategic inertia.

5.2 Evolution of Dominant Logic and Strategic Inertia

Figure 19 (see below) shows the comparisons of evolution of dominant logic in the firms. The numbers represent the extent of continuity. № 1 (in blue) refers to ∑ (single data points over the maps at t₁, t₂, and t₃). № 2 (in red) refers to ∑ (variables that are
contained in the maps of two subsequent periods, but not in the third one, i.e., in the maps t₁ and t₂, but not in t₃, or in the maps at t₂ and t₃). № 3 (in yellow) refers to \( \Sigma \) (variables that are consistently contained in the maps at t₁, t₂, and t₃). According to this, I classify:

- № 1 shows discontinuity of evolution of dominant concepts in the argumentation.
- № 2 shows partial continuity of evolution of dominant concepts in the argumentation.
- № 3 shows (full) continuity of evolution of dominant concepts in the argumentation.

When categorizing according to the above scheme, I had to exclude the continuities that would arise from period t₀ to t₁ and from t₃ to t₄, as these two periods fall outside of the systematic data gathering process (in the case of t₀ to t₁) or are not available yet at the time of this study (t₃ to t₄). Therefore, some of the single data points in the map at t₁ and t₃ could potentially be partially continuous. Similarly, partially continuous variables may qualify as fully continuous variables. However, since this applies to all firms in the same way, this constitutes a minor limitation.

![Comparison of Frequency](image)

**Table:**

<table>
<thead>
<tr>
<th></th>
<th>№(1)</th>
<th>№(2)</th>
<th>№(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpha</td>
<td>1</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Beta</td>
<td>2</td>
<td>1</td>
<td>4</td>
</tr>
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<td>Gamma</td>
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<td>3</td>
</tr>
<tr>
<td>Delta</td>
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</tr>
<tr>
<td>Zeta</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

**Figure 21: Comparison of Frequency**
With respect to the evolutionary patterns as illustrated in Figure 21, the highest number of single data points or highest discontinuity correlates with the most extensive strategic change as demonstrated by the results for Gamma-Tech (32), Delta-Tech (30), and Epsilon-Tech (24).

Furthermore, the highest continuity (see: length of bars in above figure signifies continuity of argumentation in addition to the colors)\(^{41}\) corresponds to the least change. Beta-Tech illustrates this case very well. Beta-Tech shows the highest continuity of dominant concepts symbolized by bar length in combination with the ratio of continuity of argumentation (the interviewees mention four concepts consistently over all interviews). As indicated by the comparatively short bar in Figure 21, Delta-Tech displays relatively little change; its ratio of single data points to continuous argumentation is the second highest of all firms in the sample. For instance, the interviewee at Beta-Tech consistently refers to the concepts of technological innovation,

The comparison of the above graph with the ongoing strategic actions of the respective firms during the observation period shows that conceptual change can be associated with change in strategic action. With changing strategic action, the concepts that are most dominant in the management’s reasoning are also related to change. An example is the discussion of organizational design features at Gamma-Tech. While this discussion is very relevant in Gamma-Tech’s cognitive map representing its strategy at \(t_2\), it is no longer in the map at \(t_3\). While Gamma-Tech was changing their organizational design, the interviewee from Gamma-Tech highlighted the concept of Strategic Business Units and the related organizational challenges and performance implications. Because the change had already occurred, the concept of Strategic Business Units was no longer relevant at \(t_3\) and was no longer mentioned. Beta-Tech, the firm with the least change illustrates very well the opposite case. The interviewee at Beta-Tech mentions constructs such as ‘technological innovation’,

\(^{41}\) The length of bars differs intentionally. They represent the overlap of dimensions over time.
‘social competence’ or ‘sustainability’ at each time point. Therefore, we can say that the inverse also applies: continuity in argumentation leads to change. Summarizing the above discussed, I propose:

Proposition 2a: Discontinuity of argumentation (single data points) is negatively associated with strategic inertia.
Proposition 2b: Continuity of argumentation (continuous line) is positively associated with strategic inertia.

5.2.1 Evolution of Justification Patterns and Strategic Inertia

Here, I refer to the various dimensions along which I investigated the justification patterns and their evolution. To start the reflection, I summarize the above analyses for ease of comparison. Then, I link these data to the firms with the most outstanding results in terms of strategic action. A detailed explanation follows. Finally, propositions are developed.

5.2.2 Elaboration of Justification Patterns and Strategic Inertia

In the following section, I compare the results from the analysis of evolution of justification patterns with strategic inertia, measured as the change score. When I compare the overall average of elaboration of justification among the firms with strategic inertia, I cannot detect a pattern. However, figure 22 reveals a pattern.
Gamma-Tech, the firm with greatest change, shows the most extensive change in elaboration of justification patterns. Epsilon-Tech, the firm with the second greatest change, shows the second most extensive change of elaboration of justification patterns. This pattern also applies somewhat to the remaining firms in the sample that I studied here. The empirical evidence in this study shows that a shift of elaboration in justification patterns is related to strategic change.

In order to provide a theoretical explanation of the above relationship, I invite the reader to compare the elaboration of justification patterns with the widely-accepted explanation of knowledge creation in four knowledge conversion processes (i.e., Socialization, Externalization, Combination, and Internalization) as introduced by Nonaka (1994). Similar to knowledge conversion processes, a shift of elaboration in justification patterns leads to knowledge creation. The knowledge created in the knowledge conversion processes (represented here through the elaboration of justification) is then available to the CEO and the executive team in their attempt to change the company’s strategy. At minimum, new knowledge is a prerequisite for strategic change. In this line of thought, we can say that as more knowledge is created in conversion processes (operationalized by the extent of shift in elaboration in our
graphs), there is greater potential for strategic change. This leads to the following proposition.

**Proposition 3:** The magnitude of change in elaboration of justification patterns is negatively associated with strategic inertia.

In order to specify this relationship, I distinguish between the single phases of the overall observation period (i.e., Period 1 = $t_1$ to $t_2$; Period 2 = $t_2$ to $t_3$). At all firms, excluding Gamma-Tech, the period where the firms experienced the most change is associated with an increase in elaboration of justification patterns. The most significant event in Delta-Tech’s history (i.e., the integration with Tech-Co) fell into the second observation phase and can be associated with an increase in elaboration of justification patterns. The major increase in size and the start of near-shoring activity at Alpha-Tech also fell in the second period and coincides with an increase of elaboration of justification patterns. With the exception of Gamma-Tech, larger change can be associated with greater elaboration of justification patterns. At Gamma-Tech, the high elaboration in the second observation phase is most likely due to one single score of 0.62. Because this is the highest centrality score for the entire sample, it is probably an exception to the above-illustrated pattern.

Frequently, authors in change management recommend discussing change to give meaning to events (Palmer and Dunford, 2002; Grant et al., 2002). It seems intuitive that discussing issues related to change will result in more actual change, which the popular business press often suggests (Holman, Devane and Cady, 2007).

The present study’s results confirm this assumption and ground it theoretically. Change is related to an increase in discourse (operationalized through the increase of elaboration in justification patterns). Specifically, elaboration of justification patterns results in longer causal chains and greater analysis of arguments, making flaws in reasoning more accessible. Change in elements of the reasoning process become obvious to the managers and can change their rationale for certain actions completely.
Therefore, we can say:

**Proposition 4:** Increase of elaboration in justification patterns is negatively associated with strategic inertia.

### 5.2.3 Internal and External Justification and Strategic Inertia

![Evolution of external vs. internal justification](image)

**Figure 23: Evolution of Internal and External Justification**

When examining Figure 23 and the change realized in each period (period 1: map at $t_1$ to map at $t_2$, period 2: map at $t_2$ to map at $t_3$), we notice a clear tendency for firms that show higher proportions of external justification to experience greater strategic change in the observation period. Alpha-Tech, for instance, increased their company size by one third in the first period, and had a major change in customer focus at that point in time. With the exception of Delta-Tech, we observe the period with greater external justification to be associated with more change. This is a highly plausible relationship if we consider that this study’s sample is drawn from the software industry. This industry is highly dynamic. Therefore, it seems plausible that a randomly sampled firm in this industry is well off with an external focus in their reasoning (i.e., they
adjust more to the trends in their environment than generating ideas internally), as compared to industries such as the railroad industry studied by Barr et al. (1992).

Therefore, one can formulate the following proposition:

| Proposition 5: Increase of external justification (as opposed to internal justification) is negatively associated with strategic inertia.

5.2.4 Temporality versus Generality and Strategic Inertia

![Graph showing the evolution of justification by generality vs. temporality](image)

Figure 24: Evolution Justification by Generality and Temporality

When comparing the evolution with the extent of change on each period, the graphs reveal the following pattern.

Alpha-Tech, with greater change in the second period, shows an increase of generality. Beta-Tech also displays greater change in the second period. Gamma-Tech shows greater change in period 1, Delta-Tech in period 2, Epsilon-Tech in period 2, and Zeta-Tech in period 1. Therefore, all firms, except for Alpha-Tech, show a common pattern: more justification that is temporal is associated with more strategic
change and hence less strategic inertia. This observation seems intuitive for the future—one may agree that more reference to the future is associated with more change in strategic action. However, an explanation is needed for why this would correlate with strategic action if the temporality is in the past. I claim that this is because, by referring to the past, the context of these experiences is also considered. A general argument, however, implies that an abstraction process must have taken place. In other words, the argument has been decontextualized. This reduction of context and reference rule generation explains why change is less likely for general arguments. The next step would be the reconsideration of the context. Therefore, the procedure of general arguments leading to change involves more effort than the process of putting arguments characterized by temporality into action. Hence, the following proposition is plausible:

**Proposition 6:** Increase of temporality in justification patterns (as opposed to generality) is negatively associated with strategic inertia.

The above developed propositions reveal patterns in argumentation structure (proposition 1), the evolution of dominant concepts (proposition 2), and the underlying justification patterns (proposition 3 to 6) in relation to strategic inertia. Clearly, these patterns are suggestions given that this study is inductive rather than deductive. It would be interesting to see whether the proposed relations hold for a large sample including firms from various industries.

While the proposed relations may yield valuable recourses for further studies, these are not the only explanation for strategic inertia. As discussed above in the methodology section (see Chapter 2.6.4 Strategic Inertia), numerous factors influence strategic inertia. One factor that certainly influences the relationship between the characteristics of dominant logic and strategic inertia is the environment. The study takes place at a time of economic downturn with a low increase of project and product volumes towards the end of the observation period.
The advantage of this study is that the analysis of the firms took place at the same point in time. Even though subject to the same economic environment, the firms may experience it differently. This may be due to the differences in their core business or, more importantly, to their prior experience of how to interpret and cope with the economic challenges.
6 Conclusion

To conclude, I discuss the contribution of this study and its limitations. Furthermore, I suggest several avenues for further research.

6.1 Contribution

The present study investigated the evolution of dominant logic and its relation to strategic inertia.

More precisely, this research analyzed the evolution of dominant logic through (1) the argumentation structure, (2) the evolution of dominant concepts, and (3) the evolution of justification patterns. When comparing dominant logic along these three dimensions with strategic inertia, patterns evolved. These patterns were much clearer than when comparing firm age - an important variable affecting strategic inertia - to strategic inertia. This justifies the endeavor of this study.

This study’s contribution is threefold: conceptual, methodological, and theoretical. On the conceptual level, this study contributes to the construct of dominant logic. On the methodological level, the study enhances the method of cognitive mapping in several ways. On the theoretical level, this study contributes to a knowledge-based view of the firm and an evolutionary theory.

This study contributes in various ways to the construct of dominant logic. First, existing literature treats the notion of logic mainly as bias or simplification. Hence, the majority of contributions rely on the positivistic paradigm underlying behavioral decision making. This study, in contrast, takes the understanding of logic literally and investigates the multiple possibilities offered by the comprehension of logic along several dimensions. This is facilitated by a working definition of dominant logic as “strategic arguments that are more coherent than others.”
Second, the evolutionary aspect as evidenced by the adjective *dominant* is clearly inherent to the construct of dominant logic. However, most studies do not address the process of attaining dominance. Therefore, this study’s contribution consists in investigating ‘dominance’, proposing a process as to how dominance is attained over time, and actually executing these ideas in an empirical study.\(^{42}\)

Third, this study not only proposes a consistent conceptualization of this evolutionary process, while relying on coherence as the most appropriate theory of truth, but it also fills gaps emphasized by Bettis and Wong (2003). That study presented four dimensions along which dominant logic(s) can differ: (1) their locus within the firm,\(^{43}\) (2) their content, (3) their structure, and (4) their modality.\(^ {44}\) This study contributes to the discussion of the structure of dominant logic and particularly to the evolution of the structure and, by doing so, reveals the content, which is assumed to be tightly interlinked with the structure. Because no preconceived categories or relations were imposed on the firms, revelations about the content of dominant logic could emerge freely from the data. Therefore, the arguments contained in the cognitive maps are clearly constituents of the firms’ idiosyncratic reasoning process.

Finally, this paper provides further suggestions on the relation between dominant logic and strategic inertia. While this relation has been studied previously, results are far from conclusive. The contribution here consists in the combination of the above-mentioned particularities of this study’s understanding of dominant logic and strategic inertia.

\(^{42}\) By studying the process of the evolution of dominant logic, this study also contributes to the cognitive stream within strategy research (see: Ackermann, Baden-Fuller, Barr, Daniels, Duhaime, Dutton, Eden, Fiol, Hodgkinson, Huff, Ginsberg, Kieser, Palmer, Porac, Stimpert, Reger, Salancik, Schwenk, Sproull, Thomas, Von Krogh, Walsh, etc.).

\(^{43}\) The locus of dominant logic was not varied, which confirms this study’s claim for consistency with the original concept.

\(^{44}\) The modality increased the complexity of the research tremendously and put its feasibility at risk.
This exploratory investigation into the minds of managers utilized a particular *methodological approach: cognitive mapping*. While numerous authors suggested this method for eliciting concepts, only one study to my knowledge has actually used cognitive mapping in order to elicitate dominant logic (Porac, Mishina, and Pollock, in: Huff and Jenkins, 2002). However, the present study differs substantially from Porac et al.’s study through using cognitive mapping along several dimensions. First, the *purpose* of using cognitive mapping is unique. To my knowledge, no published study utilized the established measures of centrality, domain and cluster for revealing dominance in the cognitive maps. Intentionally, this research does not assume preconceived categories. Therefore, the complexity of maps is much higher than in studies using cognitive mapping technique in the field of strategic management.

Second, this research studies the *evolution of dominant logic*, while studies using cognitive mapping mainly rely on a static comparison. The few examples of studies using cognitive mapping for comparisons over time (e.g. Barr et al., 1992) do not apply a rigid and consistent way to interpret dominant concepts and overall structure of the cognitive maps.

Third, the study contributes to enhance the possibilities of *comparing causal maps*, a major challenge of this method (Brown, 1992). Finally, this study differs from other studies using cognitive mapping technique by drawing maps from *real time data* rather than archived documents. This procedure facilitates revealing the underlying warrant at each point in time and hence the evolution of warrant or justification patterns over time. This approach is advocated by Von Krogh and Grand (2000), saying that the best way to study knowledge creation empirically is to focus on mundane management discourses, the rationale for the authors’ proposition being: “This is where the principles of justification will basically be maintained, reinvented or discarded” (Von Krogh and Grand, 2000).

Besides, this study contributes to a *knowledge-based view of the firm* (Kogut and Zander, 1992; Nonaka, 1994; Grant, 1996; Spender, 1996; Von Krogh and Grand,
2000), since a pivotal question of this view is the process of knowledge generation. With the propositions developed in this research, I try to provide additional insights on the justification process. Beyond these particular insights, this research also addresses other central questions posed by a knowledge-based view of the firm, notably: “What is knowledge?” or “How does knowledge relate to action?” or “What are criteria for validation of knowledge?” Here, the study’s results particularly contribute to questions that are concerned with the strategic change process (Von Krogh and Roos, 1996) or the “inertness of knowledge” (Kogut and Zander, 1992). This study’s main contribution to a knowledge-based view of the firm, however, is that it actually analyzes the evolution of managers’ justification patterns as they occur in real-life discourse.

Finally, this study contributes to evolutionary theory (e.g., Nelson and Winter, 1982; Dosi and Nelson, 1994). More precisely, I approached the evolution of dominant logic in three ways. First, I sampled the firms contained in this study by age groups, based on the assumption that evolution leads to cognitive rigidity. This constitutes a procedure based on evolutionary assumptions. Second, the objective of this research is the analysis of the evolution of dominant logic. Third, I analyze the justification patterns as underlying the evolution over time, although the patterns in their evolution may or may not be simultaneous to the evolution of dominant logic.

With this combination of evolutionary assumptions, this study contributes in multiple ways to evolutionary theory. First, the generic comprehension of the concept of dominant logic as “strategic arguments overarching others by coherence” yields insights for what Nelson and Winter (1982) call search routines, the routines guiding actual behaviour. For instance, Prahalad and Bettis (1995) and Nelson and Winter (1982) refer to their respective constructs as generic code or genes of the organization. Both constructs refer to behavioral and cognitive aspects. Briefly, the theoretical dilemmas faced by these two constructs resemble each other along multiple dimensions. The intention of this study consisted in providing an understanding of how dominant logic evolves.
Second, the concept of coherence is central to recent evolutionary thinking (Dosi et al., 1992). This paper gives another point of view on coherence and its evolution. Related to the conception of coherence within evolutionary theory, Foss and Christensen (1996) ask questions such as “How fragile is coherence?” and “How transferable?” I think consistent studies of the process of evolution of coherence will yield answers for these questions.

Third, the insights from this study may increase the empirical understanding of path dependence effects (David, 1985/1992; Arthur, 1990; Liebowitz and Margolis, 1990), adaptation, and variation (Nelson and Winter, 1982; Dosi and Egidi, 1991).

Finally, by referring to the process of evolution of dominance in combination with the evolution of justification process, this study opens up an opportunity for the analysis of this co-evolutionary process.

### 6.2 Limitations

This study’s limitations concern the *empirical sample*, the *methodology*, and the *execution of the research*.

The selection of the *empirical sample* constituted a particular challenge. While I intended to have *homogeneity* for reasons of comparability of the case study, I also needed *heterogeneity* in order to facilitate gaining new insights. The decision for a comparative case study represents a compromise between breadth and depth. I opted for depth rather than breadth in reducing my analysis from the initial twelve firms to six. The diversity of the sample is too high to produce deductively valid knowledge. However, the intention of this study is to improve comprehension of the process. The nature of this study is inductive with the objective of generating new theory.
Concerning the *method of this research*, i.e., cognitive mapping, two limitations are the complexity of the maps and the implicit assumptions. The strength of the cognitive mapping technique is to permit simultaneous viewing of visually complex causal relations. However, it is acknowledged that the complex information in the cognitive maps I produced cannot be fully grasped, at least not simultaneously. Rather, one needs to understand the complexity of the maps first and then sequentially analyze single paths, as I tried to do in this study by including various tables and by discussing the dominant concepts and causal individually rather than in the context of the cognitive map.

Although I realized a pilot study with experts in Information Technology, spent numerous weeks at one of the companies (Alpha-Tech), and frequently travelled to execute interviews and feedback interviews or to meet with the other company partners, there is always room for improvement of *execution of research*. Consulting a psychologist who specialized in cognitive mapping technique ensured that I had the appropriate knowledge and approach for collecting and analyzing the data.

Another limitation of this study is the limited comparability of the cases that I selected according to one central hypothesis relating firm age to strategic inertia. Although all businesses have their activities in the German-speaking software industry, their businesses vary along several dimensions. The markets that the firms in my sample serve are different. In addition, the firms vary in their industry focus. While some firms focus on financial institutions, others target the automotive industry, or governmental institutions and still others do not have a clearly defined customer focus. The firms also vary concerning the application of their software. The software products and projects that firms generate have different applications: Human Resources, security, web design or project management software. One has to consider the differences along these dimensions when evaluating the comparability of the causal maps generated in this study.
6.3 Directions for Further Research

6.3.1 Extension and Greater Generalization of the Study

An extension of the current study would be an opportunity to gather more insights. First, there is usually the possibility for more long-term observation. This setting provided me with the minimum observation of three data points derived from three semi-structured interviews. Here, the resources necessary to execute cognitive mapping technique in a comparative design were definitely a limiting factor for the current study. Given that the relationship with the company partners was very fruitful for both parties, it would be very interesting to extend this study. I expect the evolving patterns to be much more complex and revelatory about the underlying processes. The only challenge of such an extension is to provide consistency of interview partners.

Another focus of research could be to include heterogeneity on the industry level, i.e., comparing highly dynamic industries such as the software industry with more stable industries and detecting the changes over time. However, this type of research constitutes a challenge on the comparability of the maps and on the assignment of influences due to the interlinkage of dominant logic and industry characteristics.

A slightly different but also highly interesting approach as an extension of this study would be to analyze the aggregated cognitive maps and focus on the different justifications that different organizational members or executives may provide for the same dominant concept. Here, I suggest not focusing on the overlaps between the organizational members, but on the diverging explanation for the same dominant concept. This may generate very valuable insights into the potential for future strategic action.

6.3.2 Methodological Variation

Concerning methodological variation, the *repertory-grid technique* (Kelly, 1955), for instance, offers great possibilities to gain further insights into the implicit assumptions
behind dominant logic and therefore into the analysis of the warrants in this study (Brown, 1992). However, the technique has substantial drawbacks, i.e., needing to establish an atmosphere of confidentiality to where interviewees are comfortable sharing their thinking patterns.\footnote{This is also the major drawback and a reason why this method was not used for the current study.} Since the companies participating in this research showed extraordinary interest in the study and were ready to spend numerous hours so that an atmosphere of relative confidentiality between the interviewees and the researcher could develop, it would be a great opportunity to extend this longitudinal study by a repertory-grid technique.

Through frequent contact with the partner firms and the three main interviews over a period of almost two years, the researcher gained an awareness of the evolution of the strategy process at the firms. However, it would be interesting to see how the process of \textit{generation of dominant logic develops in more detail}. An adequate setting for this would be an \textit{ethnographic study} where the researcher would have permission to attend strategy meetings and workshops over an extended period. However, this high confidentiality would be rather improbable for a comparative setting, which was one of the prerequisites for the present study. Another possibility of capturing the process aspect more closely, and still have the possibility for contrasting results, would be a \textit{semi-experimental setting}. A semi-experimental setting with MBA students working in groups over days or weeks on a business simulation would be a great opportunity to see a dominant logic evolve. Concretely, one would have to do such a study in a business school with a high number of students participating in business simulations. The underlying theory here could be a constraint-satisfaction model (Holyoak and Thagard, 1989; Holyoak and Simon, 1999; Simon, 2004).\footnote{Concretely, I am planning to do such a study with the MBA students at the Fuqua School of Business at Duke University in the summer of 2007.}

A large-scale investigation would obviously extend generalizability or external validity of the current study. However, neither the method of the present study nor the
subjectivist approach to capturing the concepts for evaluating the dominant logic would be applicable for the simple reason of feasibility in terms of access to the field and the time that is involved on the side of the interviewees and researcher(s) to perform this method. Two changes in paradigm would be necessary for such a study. First, adherence to a descriptive-normative paradigm would be an epistemological prerequisite. Here, certain heuristics and biases would be investigated, e.g., ‘availability bias’, ‘confirmation bias’ (Tversky and Kahneman, 1974), ‘judgemental heuristics’ (Nisbett and Ross, 1980), or ‘assessment heuristics’ (Von Krogh and Roos, 1995). Second, an understanding of dominant logic based on the overlap or consensus among members of an organization or players in an industry would be preferable. This implies that the definition of dominant logic would be very different from the current research, but this would be within the range of possible avenues that the construct of dominant logic opens up.

A further methodological approach for extending the results of the present study would be a computer simulation. Here, I see mainly two possibilities. First, the simulation could investigate the evolution of archetypes of dominant logic based on archetypes of logic derived from this comparative case study. These archetypes of logic would differ in their content as well as in their structure. Therefore, a computer simulation could investigate how the generic logics develop when faced with varying environmental circumstances. One could also model the differences in justification: degree of elaboration, internal versus external justification, and temporality versus generality of justification. Second, an agent-based model could represent multiple agents that are subject to a variety of biases and heuristics given their limited cognitive capabilities. Variation of the environment (Eisenhardt, 1989b; Bogner and Barr, 2000), distortions in feedback from the environment (Denrell, Fang, and Levinthal, 2004) and difficulties of interpretation under these conditions (Sterman, 1989) would be interesting to study in this context.
As briefly illustrated above, the research gap that this study addressed, i.e. the relation of evolutionary patterns of dominant logic and strategic inertia offers a great array of future research opportunities and allows for a variety of methodological approaches.
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8 APPENDIX

Interview Guideline

General

What does your company do?
→ Does your company still do the same thing since we last met?

What were the greatest changes in your company (since we last met)?

Business Model

What was your original business idea?

What is particular about this idea?

Have you adjusted the idea over time?
→ What would be the greatest adjustment to your business model you could imagine (or: since we last met)?

Who is involved when you change the business model?

What led to your company’s success?
→ What will drive the further success of your company?

What could endanger the success of your company?
→ Why would this endanger the success of your company?
→ Can/should this be avoided?
→ If it can be avoided; how would it be?
→ What is done today to avoid those risks?

What is today’s goal of your company?
→ Why is that the first goal?
→ Which other goals are derived from that?
→ In contrast to which other goal might this be?
→ What might be (internal or external) obstacles to reach the goals?

Learning / Challenges
What are the greatest challenges since the foundation of your company?

How did you approach these challenges?

How did you learn from the events?

If something does not work out, what do you do, how do you proceed? (please state an example)

_____________________________________________________________________

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**Strategy / Core Business / Core Competences**

How do you take strategic decisions?
   ➔ Why do you take the decision in that way?
   ➔ Has the way you take decisions changed since we last met?

How are these evaluated and controlled?
   ➔ Why…?
   ➔ Has this changed since we last met?

What are your core competences?
   1) What do your customers think are your core competences?
   2) What do your employees think that are the most important/competences?
   3) How particular is the core business of the firm?
      ➔ Are there any changes since we last met?

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**Customer**

Who was the first customer of your company?

Which are the industry sectors in which your company does its main business today?

Do you have a customer focus?
If yes, upon which (type of) customer do you focus?

How did chose your company’s customer focus?
   ➔ Why do you/do you not have a customer focus?
   ➔ Why do you concentrate on this group of customers?

Are there changes concerning customer focus since we last met?
Strategic Alliances

Which are your technological partnerships?

How did you establish these technological partnerships?

What is the reason for you to choose these partners?

Which are the most important partners? Why is that so? Why do you have so few/so many partners?

Perception of the Industry and Competition

How does your firm differ concerning its value proposition from the competition? What are the criteria?

Who are your competitors?

How do you define your competitors?

Has the view on competitors changed since we last met?

Vision

Where do you see your company in 2010?

Which are the strengths of your company? What will be the strength of your company in the future?

Which are the weaknesses, which you would like to transform into strengths? Why?

What could endanger the success of your company in the future? Why?

What is the greatest opportunity for your company? Why?
Daniela Patricia Blettner  
08/24/1974, Augsburg, Germany

EDUCATION

2002 Master of Business Administration (MBA), with distinction 
Sheffield Business School at Sheffield Hallam University, U.K.  
Thesis Title: “How can Communities of Practice add Value to Consultancy Firms?”

2000 Postgraduate Diploma in International Business Administration  
Ecole Supérieure de Commerce Internationale (ESCI) in Fontainebleau, France

1995-2000 Master’s Degree in Modern Languages (MA), with distinction  
Thesis Title: “Comparative Analysis of Gallicisms in an 8000 pages corpus of Italian and Spanish newspapers”  
Ludwig-Maximilians-Universitaet, Munich, Germany  
Julius-Maximilians-Universitaet. Wuerzburg, Germany  
Universidad de Zaragoza, Saragosse, Spain  
Université de la Sorbonne, Paris, France

WORK EXPERIENCE

2005-2008 Visiting Scholar and Adjunct Faculty  
Kenan-Flagler School of Business at the University of North Carolina (UNC)

2005 Visiting Scholar as part of the doctoral studies  
École des Sciences de la Gestion at the Université du Québec à Montréal(UQAM), Canada

2002 - 2005 Research Associate at the Research Center for Innovation, Strategy, and Entrepreneurship (RISE) and Teaching Assistant at the chair of Georg Von Krogh, University of St. Gallen

2001 – 2002 Consultant with PricewaterhouseCoopers  
PricewaterhouseCoopers, Frankfurt

2001 Consultant as a part of the MBA Degree  
Noel Village (Steel Founder) Ltd - Doncaster, U.K.