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Contributions of the Concept of Self-organization for a Strategic Competence-management

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Contributions of the concept of self-organization for a strategic competence-management

1. Introduction

Due to the fast technological development, particularly in the communications sector, the last decade has been marked by a drastic shift from the industrial era to the information age. These changes are characterized by phenomena of hyper-linking, hyper-competition and hyper-turbulence (Tapscott, 1999; Siegele, 2002). The management has to cope with an expanding complexity of its highly dynamic environment. Consequently, demands for competences such as flexibility and adaptivity of systems rise. Therefore, higher decision-making competences for the management are needed to deal with the immanent complexity of their planning. Requirements for a more adaptable and more capable strategic competence management include the necessity to increase planning-, steering-, and controlling-competences in order to deal with the complexity and dynamic of organizational systems.

This discussion draws on recent reflections about possibilities to support the strategic competence management in increasing the adaptivity by measures of system integration on the one hand and in preserving the identity of the system through stabilization on the other hand. For this purpose the approach of self-organization, which deals with the development of order in complex systems, is an appropriate instrument. The objective of this discussion is therefore to deduce possible contributions of the concept of self-organization to a strategic competence-building and competence-leveraging.

This discussion is organized in the following way. Section 1 identifies current challenges of flexibility in competence-building and competence-leveraging, which are reflected in the paragraphs "flexibility as a basic requirement" and "the need of balance and the dualistic role of flexibility". A possible method of resolution of these challenges constitutes section 2, which describes the concept of self-organization in its history of development and its core statements. Section 3 examines potential contributions of the concept of self-organization for a strategic competence management with regard to the previous deduced challenges. A conclusion and implications for the application of the concept of self-organization within a strategic competence management can be found in section 4.

2. Challenges of flexibility in competence-building and competence-leveraging

2.1. Challenge 1: Flexibility as a basic requirement

Given that companies are attributed to the group of social systems (e.g. Luhmann, 1984), the argumentation of flexibility as being necessary for coping with complexity will initially be presented from a system-theoretic perspective. Correspondent propositions of the system-theory indicate that systems show a tendency towards self-preservation and balance (Ashby, 1962, p. 270) as well as a tendency to attain and preserve specific characteristics, which are necessary for achieving the system goals (Luhmann, 1999, p. 23; Beer, 1963, p.21; Mayntz, 1977, pp.40). To keep this equilibrium, according to Mayntz, social systems distinguish themselves on the one hand through a certain degree of integration but on the other hand are also characterized by a distinctive closure, which contributes to a differentiation from the environment to eventually preserve the separate identity (Mayntz, 1977, pp. 40). *Integration* as one characteristic enables the system to communicate with the environment through mutual interrelations and therefore to sustain the existential exchange process of resources (Staehele, 1999, p. 417; Böse/Schiepek, 1989, p. 121). This process of integration is implemented by system openings (Luhmann, 1973, p. 173), in which the system absorbs a part of the complexity of the environment to pursue the system goals, e.g. in terms of resources and information. Freiling also refers in this context of the identification, integration and utilization of external resources to a company's capacity of absorption (Freiling, 2004, p. 17). The term "open systems" as well as its understanding and use in organizational and management theory, was adopted from the natural sciences (e.g. Sanchez/Heene, 1996). To implement this process in a complex dynamic environment, the system must have organizational flexibility for being able to adequately respond to the changing and diverse environmental conditions, such as technological progress and emerging market demands (Sanchez, 1993, 1995). Thus, for example, a strategic flexibility to alter the strategic course of action is required, if changing circumstances give a reason to do so (Sanchez, 1997, p. 943).

To ensure the adaptiveness of the system in the long run and therewith the competitive advantages on the part of the strategic competency management, which are based upon a unique, valuable as well as unimitable and insubstitutable pool of genes (Well, 2001, p. 151), it is therefore desirable according to Al-Laham and Teece et al., to accomplish pre-conditions for a consolidation, further development and regeneration of these genes (Al-Laham, 2003, p. 160; Teece et al. 1997, pp. 524). According to McKelvey/Aldrich these genes correspond to

the company-specific „comps“ – here referred to as competences – , which form the basis for the evolution of the company (McKelvey/Aldrich, 1983, p. 113). The demand for dealing with external changes consequently entails the establishment of a variation-mechanism with recourse to evolution-theoretic reflections, to guarantee a continuous internal readiness for change regarding the competence spectrum of the organization. Thus, organizations have to generate new variation patterns of competences, which allow dealing with the environment through passive adaption processes as well as active interventions in their own organizational structure (Al-Laham, 2003).

On the one hand this provides a basis for retention (Wolf, 2003, pp. 293), in this case the maintenance and stabilization of profitable competences, which proved to be helpful to achieve the company goals and therefore will firmly be anchored in the system. On the other hand their utilization may invariably amount to context-conditional changes in the competence structure, which from an evolution-theoretic perspective would be conceptualized under the term of variation (Macharzina, 2003, p. 73). Moreover, the formation of variation patterns bears the opportunity of selection (Wolf, 2003, p. 292), i.e. the opportunity of sorting individual competences, which in the process of development proved to be ineffectual for achieving the company goals.

According to Al-Laham learning processes are necessary to form these competencies (Al-Laham, 2003, p.83), which relate to the further development of the existing knowledge pool of the organization. Utilizing existing competences involves the production of new knowledge (Freiling, 2004, p. 6) in ways that variations of existing competence patterns (formed by retention, mutation and selection) can be seen as internal alteration processes of the organizational knowledge base. According to Pawlowski these alteration processes distinguish themselves by a continuous review and, if necessary, extension of knowledge (Pawlowski, 1998, p.13). The implementation of this knowledge into processes of competence-building and -adaption requires a flexible organization after all, which must be alterable in regard to its structures, processes and actions. If, for example, potentially relevant system requirements of the environment were realized, adequate measures of adaption must be conducted within the competence-arrangement of the organization. Thus, flexibility is not only to be seen as a competence of the system, but also as a mandatory condition for the system to eventually build competences.

Consequently, flexibility is a requirement for the entire competence structure of a

company. It could be understood as a competence itself, or as a part of the competence-arrangement of the firm. Referring to competence theory, this understanding of organizational flexibility complies with and supports the goal of strategic management, which is to establish the organization as an adaptive system (e.g. Sanchez, 1997, p. 940).

2.2. Challenge 2: The need for balance and the dualistic role of flexibility

As a consequence of the previous specifications it can be deduced that only a flexible system can process the absorbed information and resources along with changing environmental conditions and at the same time adapt to these, if necessary. Thus, flexibility is a basic requirement for the system's ability of integration. The integration of a system equally implies the demand to differentiate itself from the environment. Through the system opening in the process of integration the borders to its environment become increasingly indistinct. Therefore, it is all the more important to stabilize these for not losing the separate identity in the permanent processes of adaption.

Thus the capabilities of system closure and partial system openings are essential in order to cope with the absorbed complexity of the environment, respectively. This means that the system does not absorb the entire complexity of the environment, but only the portion, which in terms of the specific problem solving ability corresponds to the system's identity (Luhmann, 1994, pp. 261). The process of system closure is implemented by creating and maintaining a system border, which in doing so constitutes itself – according to Hill/Fehlbaum/Ulrich – of the number and intensity of interrelations between the system elements and the environment (Ulrich, 1970, pp. 109; Hill/Fehlbaum/Ulrich, 1994, p. 21). In this way it distinguishes the system from its environment and stabilizes its identity at the same time. With an increasing degree of flexibility the system borders become more permeable and therefore appropriate measures of stabilization gain in importance to compensate these. *Stability* is consequently a second fundamental key factor for the survival of a system in the long-run, which is indispensable for securing the system's identity (Maturana/Varela, 1987, p.50).

Consequently, being able to survive in complex dynamic environments implicates the necessity for systems – in this case specifically for the strategic competence management – to adequately balance the proportions of integration and identity preservation. On the one hand

the system needs to be flexible enough to adapt to the changing environmental conditions through flexible adaption processes of the competence structure, if required. But on the other hand it has to remain stable to a degree where it can preserve its identity despite any system modifications. This implicates that the increasing degree of flexibility must always be coupled with an increase of system stability for closing the gaps, which originated from openings in the periphery of the system.

Specific competences are necessary to satisfy these requirements of the system, which is the integration of the system in its environment alongside the preservation of its identity. Regarding the aspect of flexibility, appropriate competences are required to provide the system with the necessary ability of integration, and which enable the system to e.g. recognize, evaluate and operationalize environmental conditions in direct measures of action. To succeed in forming a collective identity within the company system, specific competences are required, which bestow the individual elements of the system with the ability to select the pieces of information and resources from the environment, which the system needs for its specific problem solving and for closing itself vis-à-vis the external influences, which are not part of this selection. According to Sanchez et al. competences can be understood as „[...] the ability to sustain the coordinated deployment of assets in ways that help a firm achieve its goals.” (Sanchez/Heene, 1996, p. 8 and Sanchez, 2004. p. 521). Competence-based management is one of the foundation stones of competence-based theory. The function of a competence-based management includes the identification, evaluation, arranging, building and leveraging of the competencies of a firm (e.g. Barney, 1996; Thiele, 1997, Hamel/Prahalad, 1997; Klein/Hiscocks, 1994; Rogulic, 1999). It refers to dynamic, systemic, cognitive, and holistic concepts of competence (Sanchez/Heene, 1997, pp. 303). Based on this, Sanchez (2004, pp. 523) determines five “modes” of competences: 1) cognitive flexibility to imagine alternative strategic logics; 2) cognitive flexibility to imagine alternative management processes; 3) coordination flexibility to identify, configure and deploy resources; 4) resource flexibility to be used in alternative operations; and 5) operating flexibility in applying skills and capabilities to available resources. These five modes present different kinds of flexibility. They respond to a changing environment, for instance changing market conditions or changing technology. In this context the most significant role in competence-building and competence-leveraging is assigned to the feature of flexibility. Both, competence-building and competence-leveraging stand for specific forms of activeness and processes within the organization. They go hand in hand with a certain extent of

modifications and therefore require organizational flexibility.

On basis of the previous specifications, a *dualistic role of organizational flexibility* in terms of competence-building and leveraging can be identified. On the one hand flexibility as a competence itself or as a part of the competence-arrangement is needed to endow the system with the necessary adaptiveness, which will secure its survival in a dynamic, complex and highly competitive environment in the long-run. On the other hand precisely these components of flexibility are to provide the system with a basic flexibility within its predisposition. This is imperative for enabling the system to build and leverage competences in a permanent process of development.

For this reason the strategic competence management has to face two basic challenges, which as a result of the constantly changing environmental conditions arise from hyper-linking, hyper-competition and hyper-turbulence:

1. the basic requirement of flexibility
2. the need for balance between flexibility and stability

To meet these requirements effectively, our assumption states that the approach of self-organization could be an adequate instrument for the strategic competence management. Therefore, the following demonstrations give a brief discourse into the history of development and into the core principles of the approach of self-organization and intend to critically examine this approach in terms of its contribution potential concerning the two challenges.

3. The concept of self-organization

3.1. Origins of self-organization

The exact date of origin of the research program cannot be precisely identified due to the fact that it emerged from multiple sources. In particular in the history of ideas as well as in philosophic history the approach to self-organization cannot be clearly traced back. The concept of self-organization has its historical roots within multiple academic fields (e.g. physics, biology and chemistry) and going back at least to philosophical sciences in 500 BC. The intention of this young science is to study, explain and identify general principles on how complex systems autonomously create ordered structures. The concept was originated in the 70's by separate scientists of different disciplines, e.g. Von Foerster (1960) (cybernetics), Prigogine (1971) (chemistry), Haken (1973) (physics), Maturana and Varela (1980) (biology).

After recognizing a common background of the notions complexity and order at the end of the 70's, a basis for a comprehensive interdisciplinary theory was established. Until now this young science is still at a stage of forming and developing. First results of different approaches of self-organization diffused already into other fields of science. For example the approach of autopoiesis of Maturana and Varela (1980), for instance, appears in different scientific fields, such as sociology with reference to Luhmann's systems theory (Luhmann, 1994), as well as in psychology in the area of family therapy (e.g. Hoffmann, 1984). In order to generate a theory of complexity in not only formal science, but also within social systems, the merging of ideas of separate concerned approaches, such as synergetics, autopoiesis, dissipative structures etc. is essential.

3.2. Main statements of the concepts of self-organization

The concept of self-organization does not present an "over aging paradigm" but there is a general overlapping of attributes like complexity, dynamics, non-determinism, autonomy, redundancy, interaction and emergence, which can be found in several approaches belonging to the concept of self-organization.

To begin with, the above-addressed concepts could be broadly summarized under the examined research object. They all deal with *open dynamic complex systems* far off from a state of balance. Thereby it is not crucial, which kind of nature they are attributed to (e.g. living or non-living systems), but it is rather of importance that they possess a high occurrence of existing interrelations between the elements of the system as well as between the system and its environment (Dörner, 2001, p. 60; Malik, 2000, pp. 186). Probst/Gomez particularly emphasize the aspect of dynamic in their understanding of complex circumstances, which differentiates complex systems from complicated systems. A system can be specified as complicated, if it features various internal elements and links, as for example, in a functional description of a major machine. Referring to Probst/Gomez, complexity is not reached until a state of high dynamic between the system elements is identifiable, which describes the rate of modification of a system over a specific period of time, i.e. observable in biological cycles (Probst/Gomez, 1989, p. 3). Another common feature is the characteristic of non-determinism, which is found in all self-organizing systems. This means that the behaviour of the system is not causally predestined and thus not predictable (Haken, 1983; Prigogine, 1996).

The aspects of *complexity and dynamic* fulfil a fundamental function, which contributes to finding an answer to the question of how order evolves in chaotic systems. The individual elements of the systems considered separately, do not yet account for the formation of an ordered structure. However, researchers discovered by examining the complete system, that ordered structures evolve from the interaction of the individual elements, irrespective of external causes or internal demands. The research work of Haken, who detected the phenomenon of self-organization by investigating laser light, is a useful example. He observes individual light waves, which after supplying them with energy autonomously arrange themselves from a chaotic system status to a profoundly structured state, the laser (Haken, 1987). Similar discoveries were made by the researcher Prigogine when he fed a liquid with energy. As a result, an autonomous formation of patterns occurred, which he called dissipative structures (Prigogine/Glansdorff, 1971). But also without human interference, systems *autonomously* aim for a permanent ordered status, i.e. a balance as demonstrated in the research on living systems of Maturana/Varela (Maturana/Varela, 1987) or as in the concept of the ecological equilibrium (e.g. Odum, 1987).

One further major aspect of the observed systems is the feature of *redundancy*. Each element or subsystem of the complete system is equipped with the same assets and abilities by its nature, as for example, the individual light waves of Haken or the atoms of the dissipative structures of Prigogine. Whether a system element takes over the function of ordering in the process of self-organization and if so, which one of these elements, is dependant on how much more information (Probst, 1987, p. 81) or energy (Haken, 1987, p. 139) it possesses at a particular time compared to the other elements.

The development of a self-organized order within a system is the result of an *interaction* of the various system elements (Haken, 1987, pp. 132). From this process of interaction of the individual elements new qualitative characteristics of the system arise, so called *emergences*, which cannot be related to individual system components, but result from the synergy effects of the interacting elements (Haken, 1993, p. 16). Through processes of self-organization the system reaches a new increased level of quality, which distinguishes itself by an improved ability of the system to cope with complexity and therewith by a better fit of system structure and environmental demands

3.3. The concept of self-organization applied on business systems

Since approximately 1980 the concept of self-organization had reached a stage of

popularity and maturation, which even prompted researchers, who were not involved in the development of the concept, to look into the subject of self-organization. Therefore, the results also diffused into the field of business science, in which particularly e.g. Probst, Kirsch, Göbel, Malik, Hayek and Luhmann deal with the application of the self-organization concept on business systems (Probst, 1987; Kirsch, 1992; Hayek, 1994; Luhmann, 1994; Göbel, 1997; Malik, 2000). Up to now a consistent understanding, and thus a consistent definition of self-organization transferred into business science could not be established yet. As the on the above described applied concepts of self-organization in the economic field are much focused to their particular problems, the definitions of self-organization in business science of the presented appliances are specific as well. While Malik sees self-organization as "evolutionary problem solving" (Malik, 2000), Probst pursues a rather holistic approach of self-organization for the management and conceives self-organization as the emergent product of the system, resulting from the interplay of employee activities including the top management (Probst, 1987). Kirsch focuses in his work on the aspect of communication, which principally carries into effect self-organized processes (Kirsch, 1992). Hülsmann/Windt (2005), who are concerned with self-organized processes in logistics, worked out a more general definition, which describes self-organization in business sciences as processes of decentralized decision-making in heterarchical structures. It presumes interacting elements in non-deterministic systems which possess the capability and possibility to render decisions independently. The objective of self-organization is the achievement of increased robustness and positive emergence of the total system due to a distributed and flexible coping with dynamics and complexity (Hülsmann/Windt, 2005).

Thus, increase of the degree of self-organization in the organizational structures of the strategic competence management in general, means leaving operative decision-making in its sub-systems, -units, and -elements (Hülsmann/Windt, 2005). The individual system components have the possibility to design their individually needed competences autonomously and to manage and advance the further competence development corresponding to their needs without being in a dependency to external instances, such as the strategic competence management. Probst and Kappler summarize this freedom of decision of individual organizational units under the term of autonomy (Probst, 1987, p. 82; Kappler, 1992, p. 272). In doing so, higher *flexibility* of the entire system regarding decision-making processes will be achieved by focusing on smaller organizational units and their relations to the top-management. Consequently, it is expected that capacities of managing and planning

will deepen. More flexible adaptations to environmental demands for regaining and keeping system stability of the separate system elements could take place and thereby more capacities for discovering alternative ways of handling things will be available.

Based on this understanding of self-organization related to business systems, potential contributions of the concept of self-organization regarding the challenges of system flexibilization and of the necessary balance between the aspects of flexibility and stability will be critically examined in the following.

4. Contributions of self-organization to the management of competence-building and competence-leveraging

4.1. Contributions to the flexibilization of a competence management

As demonstrated in chapter 3, flexibility is a basic requirement for the strategic competence management. In the following the contribution of a self-organized strategic competence management will be examined in terms of system flexibility and in regard to qualitative, quantitative, temporal and spatial aspects.

The mentioned processes of delegation, which would be necessary in the context of implementing self-organizing structures, are linked with different effects of flexibility in organization-theoretic literature. Delegation enables the elements or sub-units of the systems to make decisions, which are spatially closer to the operational level of work (Mullins, 2005, p. 608). The spatial closeness of decision-making is coupled with the temporal effect of flexibility of self-organizing structures. Information can flow faster on the level of the sub-units. In this manner, ways of decision-making become shorter and faster, which in turn allows to rapidly and systematically respond to short-term or changing environmental demands, as for example, improved personal customer services. It is assumed that the ability of problem solving of the complete system increases through this spatial and temporal closeness of decision-making, quantitatively as well as qualitatively.

Through the processes of delegation the sub-units would have the necessary freedom to develop different variation patterns of competences in the constantly changing conditions. These could provide the system with the required flexibility to let evolutionary processes of retention, mutation and selection of competences unhamperedly take place. The outcome could immediately be fed into the competence arrangement of the individual sub-units. Due to the permanent natural autonomous adaption of the competence arrangement to

environmental conditions, the individual sub-units autonomously decide on the ideal degree of integration of the sub-system, i.e. which resources and which pieces of information are needed from the sub-system to solve a problem to which extent and at which time. Only the sub-units, which operate at the source of action directly, dispose of the relevant information to know which competences are needed at which time. Therefore, the qualitative level of the – in this way autonomously – formed competences is clearly higher since the affected sub-units can precisely adapt them to the current environmental conditions.

This, however, can only be implemented by the individual sub-units if correspondent competences exist in development and management e.g. decision-making within groups. Consequently, the ability of system integration increases, as operational levels of work recognize faster and evaluate necessary competence requirements and thus are able to implement them in measures of adaption and therewith to provide the system with flexibility.

Through processes of decentralisation, which means the approach to a heterarchically organized structure, the company is in the position to distribute the entire complexity (consisting of the system's as well as the environmental complexity), among the divers sub-units and elements of the company. In doing so, the quantitative level of complexity, which the management of strategic competence-building has to cope with, could be reduced. This could go hand in hand with an increase of system flexibility. Instead of concerning and controlling the required competences of each individual element and its system interrelations, it now only considers the sub-units of the organization in its processes of planning, designing and developing of competences. In this way the system-flexibility could arise cause the management have more capabilities to act. Since it only maintains the relations to the sub-units, the number of relevant system determinants is less. The level of management benefits from this: on the one hand it has more capabilities to keep a general overview of the entire system development, which means it can faster recognize incorrect developments or basic lacks of competences and could more systematically intervene. On the other hand it has more capabilities to develop the ability to support their subordinates increase their capabilities of managerial competencies (Hitt/Black/Porter, 2005, p. 237).

Consequently, a self-organized strategic competence management can contribute to provide the complete system through spatial and temporal advantages with the necessary basic flexibility to form and further develop competences. But through qualitative and quantitative effects it can also lead to an equipping of the formed competences in the sub-systems with a degree of flexibility, e.g. increased problem solving ability of the sub-units,

which in turn provide the complete system with flexibility. Thus, a self-organized strategic competence management can also fulfil the dualistic role of flexibility.

4.2. Contributions to the balance of flexibility and stability

Alongside the advantages of self-organizing structures in terms of their ability of flexibilization, the possible risks of losing stability and thus system identity must equally be considered. As demonstrated in the previous specifications an increased degree of integration (as a result of arisen flexibility) at the same time implies the demand for measures of compensation to stabilize the by means of increased flexibility debilitated identity of the system. A permanent task for the strategic competence management is to find the ideal degree of system integration and system identity, which can permanently change due to the internal and external dynamic system status. To analyse the contributions of the approach of self-organization to this balance-act of strategic competence management, the potential risks of flexibilization within a self-organizing system will first be clarified on the basis of some examples. Afterwards the positive stabilization effects of a self-organizing competence management are demonstrated in terms of compensatory measures, which could contribute to a balance of both of requirements, flexibility and stability.

Through processes of delegation and decentralization a lack of information on the level of management can arise, which under certain circumstances can lead to a sub optimal integration level of the system. The level of complexity from the perspective of the management and the individual sub-units decreases, but in consideration of the complete system, the degree of complexity in turn increases. The management can examine the measurable output of the sub-units and thereafter evaluate the competence-building and leveraging, but it does not any longer have an overview of the individual internal processes and interrelations of the sub-units. Due to the increased scope for decision-making, the number of interrelations of the individual sub-units can uncontrollably rise and therefore resemble a black box from the external perspective. This intransparency, which is also discussed according to the agency theory embraced by the terms of „hidden action“ and „hidden information“, bears the risk of the so called „moral hazard“. From a competence-theoretic view this would mean that due to the lack of observability of the sub-units a asymmetrical distribution of information could originate on account of the management level, which the sub-units opportunistically could take advantage of by developing competences aimed at their own needs and objectives and implementing these in the sub-system. These

competences in turn are not compatible with the environmental conditions of the system.

Moreover, the implementation of self-organized flexible structures may implicate that the individual sub-units do not form their competences in the direction, which was planned by the strategic management. Although a kind of ordered structure evolves from this phenomenon, it is not desirable in the sub-element or in the overall view of the company, as it does not correspond to the goals of organization. Göbel also speaks in this context of autogenous self-organization (Göbel, 1998, pp. 184). This way of self-organization compared to planned autonomous self-organization can neither be autonomously controlled by executive positions nor by employees. It evolves from automatic actions, which consolidate in the course of time and eventually become accepted by the employees as natural rules of action within their job completion. Thus, detaining structures for competence-building could develop, if a general negative attitude towards innovative work strategies arises among the employees as a result of e.g. the fear of losing accustomed work procedures or prestige positions (Burke, 1982, pp. 52).

In case of conflicts between the sub-units caused by the processes of decentralization and thus changing processes of perception, the system's basic stability would be at risk (Staehele, 1999, pp. 301). These conflicts could result from a too strict focusing of the sub-units on their own system borders, whereby the overview of the own position in the complete system becomes unclear. These sub-units could begin to act in disfavour of the other sub-units. Instead of an atmosphere of cooperativeness, a form of competition within the company would develop in this case. This could inhibit the forming of synergy effects, which are based on the effective interaction of the individual system elements.

Since these disadvantageous effects of flexibilization present general disadvantages of self-organization as well, these could not directly be solved with the same concept. However, the concept of self-organization implicates potential contributions to outbalance debilitations of the system stability. The divided coping with dynamic and complexity in self-organizing structures (Hülsmann/Windt, 2005), provides the opportunity for the strategic competence-management to form system-stabilizing competence patterns. External disturbances such as a sudden serious environmental change concerning a specific competence requirement do not necessarily compromise the entire competence arrangement of a company in a self-organizing system. In the approach of self-organization it is referred to so called "restoring forces" in connection with the term of "ecological balance" (Bick, 1998, pp. 43). These enable the system to autonomously induce and accomplish regeneration processes and to return to its

original "stable" state of balance after a disturbance. The affected sub-units can autonomously and directly respond to these environmental changes due to their increased degree of autonomy in a self-organizing competence-management that is without going an indirect way via arbitrations on the management level. This response of the sub-unit manifests itself in an adaption of the competence arrangement to the modified environmental condition, which leads to an increasing degree of stability by means of the adapted competences not only for the sub-unit, but possibly for the complete system as well. This, however, implies basic requirements for the individual sub-units, which should be able to realistically evaluate their own potential that is to recognize disturbances at an early stage, to evaluate and operationalize these within activities. This means each of the sub-units should have to decide at the moment of disturbance whether it can handle the situation itself or whether an executive instance should intervene, i.e. the strategic management level. Given that the sub-units imply all of these described abilities, they would be in the position to autonomously alter their competence structure and thus, to simultaneously increase the stability level of the company by means of the implemented actions of adaption. In this case the concept of self-organization also refers to the condition of redundant capabilities of a system, which accordingly increase the degree of stability.

One further contribution to the basic stability of a company's competence arrangement might be accomplished by the synergy effects, which result from the concept of self-organization and which could provide the basic requirement for the necessary stability. Through the interaction of the autonomously organized competences of the individual sub-units, according to the conclusions of Haken the complete system experiences emergent characteristics, which raise it to a higher level of order (Haken, 1993, p. 16). From a competence-theoretic perspective a higher level of order would stand for a competence arrangement of a company, which is even better adapted to the environment and in turn demonstrates an increased degree of system stability. Thus, an adaptive system does not only imply a system's ability of integration, but also the preservation of its own identity by reaching a certain degree of stability. As the originating emergences of the system merely evolve from the bundling of company-specific resources and therefore from the focusing of the individual competence arrangement, in this connection it can be referred to the generation of core competencies (Hamel, 1994).

5. Conclusion

Based on the previous specifications the concept of self-organization appears to be an adequate approach to support the competence-building and -leveraging of the strategic competence management. Due to its general effect to increase system flexibility, self-organization contributes to increase the basic requirements for the formation of competences. Along with this, it implicates as a result of the heterarchical structure (the temporal and spatial closeness) of decision-making, the direct possibility of influencing the flexibility degree of the competences themselves through qualitative as well as quantitative effects of self-organization. Additionally, referring the main statements of the concept of self-organization it could be assumed that through the interacting of the various system elements emergences of the system arise (Haken, 1993, p. 16), which improve the ability of the system to cope environmental demands for specific and general competences. Overall, the approach of self-organization can satisfy the needs of a dualistic role of flexibility, which describes on the one hand flexibility as a basic requirement of the system structure to enable the system to build and leverage competences. On the other hand flexibility as a competence itself is needed to endow the system with the necessary adaptiveness, which will secure a sustainable survival of the system in a dynamic, complex and highly competitive environment.

In the course of these flexibility effects, however, the risk of possible instabilities of the system increases as a result of potential problems of a self-organized competence management, such as e.g. problems of intransparency and moral hazard, autogenously self-organization and intergrouping conflicts.

For these reasons the chances for a competence-building and competence-leveraging rise with a self-organized competence management and at the same time the requirements for the strategic competence management itself. To guarantee an existence of the system in the long-run, it has to find an adequate balance between the requirements of flexibility, i.e. the integration of the system and the involved necessity of system stability for the preservation of the system's identity. This balance-act poses a dilemmatic situation for the strategic competence management, which according to Fontin is in general characterized by two reasonable options, for which equal, but contradictory substantiations can be found (Fontin, 1997). The two reasonable options originate in our case from the simultaneous necessity of system openness for absorbing complexity from the surrounding (integration) and system closeness for the ability to cope with the absorbed complexity (system closure) (Gebert/Boerner, 1995; Gharajedaghi, 1982). The strategic competence management is in a special situation, which by Hülsmann/Berry is called dilemma of success (Hülsmann/Berry,

2004; Hülsmann, 2003). In order to fulfil the task of balancing the systems degree of integration and identity, the management has to decide whether to either invest their rare resources into the flexibility or the differentiation of the system. Only if both tasks are perfectly performed, a management could build up and leverage its needed competences successfully. Consequently, it could be argued that a self-organized strategic competence management implies the parallel implementation of a dilemma management.

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