

Auftragstaktik for Business Organizations in Volatile and Uncertain Environments: a Competence-Based View

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Abstract

Dynamic and uncertain environments present challenges for business leaders and the governance of businesses. This encourages entrepreneurs and senior managers to look at other domains confronted with similar developments, such as the military sphere. Similarities to the military world are obvious: the military theorist Carl von Clausewitz (2010) characterizes war and conflict as non-linear, ambiguous and chaotic, meaning that military organizations have to adapt to perform well. Creveld (1985) underlines the high relevance of command and control systems for the military, focusing on coping with uncertainty, reducing complexity and enabling adaptability and flexibility. Consequently, recent business and management research has been looking at the flexible management concepts and governance modes used in high performance organizations, especially in the military sphere. Shilling et al. (2008) point out the innovative and adaptive side of Auftragstaktik (AT) as a governance mode that successfully formulates leadership and organizational processes across functional areas and is an essential element of management and leadership (Creveld, 1985). AT is able to address these governance challenges within business organizations.

In this conceptual paper, the author demonstrates that the military governance mode of AT, developed by the Prussian-German General Staff System and modified for the German Federal Armed Forces, is useful for business organizations in volatile environments, exemplified by the competence-based view.

Keywords: Auftragstaktik, competence-based view, anomic behavior, strategic flexibilities

Introduction

In recent times, businesses have faced growing challenges in terms of management, governance and leadership in a world where environmental volatility, uncertainty, complexity and ambiguity are inherent (Lawrence, 2013). Similarities to the military world are obvious: the military theorist Carl von Clausewitz (2010) characterizes war and conflict as non-linear, ambiguous and chaotic, and military organizations have to adapt to perform well. Creveld (1985) underlines the high relevance of command and control systems for the military, focusing on coping with uncertainty, reducing complexity, enabling adaptability and flexibility, accomplishing missions and realizing the minimax principle. Current management and leadership concepts focus on continuous change management and are less than adaptive when it comes to major unpredictable changes in highly volatile environments. Examples include Management by Objectives (Gebert, 1995; Hurst, 2013), the German Harzburg Model (Grunwald and Bernthal, 1983; Wunderer, 1995), the Japanese Kaizen (Imai, 1986) and the concept of semistuctures (Brown and Eisenhardt, 1997). Therefore, recent business and management research has been looking for flexible management concepts and governance modes for high-performance organizations that successfully recognize the effects of a combination of high complexity and high uncertainty (Weber, Königstein & Töpsch, 1999; Shilling et al., 2008; Bungay, 2011). In business (Shilling et al., 2008; Lutz, 2013b) as well as academia (March and Weissinger-Baylon, 1986; Schössler, 2013), the military technical term “Command and Control” often has a negative connotation implying strict governance rules and micromanagement, with strictly hierarchical and conservative structures being characteristics of the military. However, Shilling et al. (2008) point out the innovative and adaptive side of AT as a governance mode that successfully formulates leadership and organizational processes across functional areas and is an essential element of management and leadership (Creveld, 1985). Dupuy (1977) and Creveld (1982) emphasize the great impact of AT on military performance. There have been few attempts to translate military experiences with AT into business and other domains. Hinks, Alexander and Dunlop (2007), for example, relate AT to the primacy of innovativeness as a prerequisite for innovation in facility management. Leadership which grants leeway to local managers tends to be supportive of innovation, as exemplified in a case study from WW II applying AT. Suparamaniam and Dekker (2003) recognize the discrepancy between responsibility and authority during disaster relief operations. They propose the application of AT to renegotiate authority between the strategic, operational and tactical levels of project management in order to successfully solve goal conflicts or authority dislocation during disaster relief operations. AT is able to address these governance challenges faced by business organizations. In this paper, the usefulness of AT is compared with the competence-based view, an established management approach for responding in uncertain and dynamic markets (Sanchez and Heene, 1997a).

The following section describes the basics of AT. Business challenges and the competence-based view are the focus of the following chapter. Answers to the question “How can AT address the management and leadership challenges facing business organizations identified by the competence-based view?” are included in the findings of the paper, followed by a brief conclusion.

The military governance mode of AT

The origin of AT – from Clausewitz to Moltke

Two hundred years ago, in his work *Aphorismen* (Donker, 2016), the military theorist Carl von Clausewitz (1780–1831) characterized war as chaotic, uncertain (“fog of war”) and containing so-called “frictions”, mostly unforeseen and unpredictable events (Clausewitz, 2010) that are known as “black swans” in business terminology (Taleb, 2007). Clausewitz (2010) claimed that principles, rules and even systems of strategy are often misleading in a world where chance, uncertainty and ambiguity dominate. In the tradition of Clausewitz, Moltke the Elder (1800–1891) argued that strategy is a system of operational actions and reactions (*Aushilfen*) in volatile environments such as war and conflict: “No general plan survives the contact with the enemy for more than twenty-four hours” (Moltke, 2000, p. 77). Moltke refused to define concrete guidelines for military leadership. “The commander, who in our days no longer leads a closed phalanx but different armies in different theatres, cannot manage without the independent action of his subordinate commanders. A victory won without – or even against – higher orders can still be part of the totality, for each victory carries with it far-reaching effects. The commander will add it into his calculations, as he does all those other facts that went into modifying the plan he originally conceived and held to steadily” (Moltke, 1894, p. 308).

The strategic plan could, if necessary, be revised and re-oriented by ad hoc decisions and updates based on real-time events, following the core intent of the (strategic) commander. This understanding of governance allows for the exploitation of opportunities on the operational and tactical level, with decisive impacts on strategic plans and decision-making processes, leading to a quick and flexible situational adaptation to changing environmental conditions. Moltke emphasizes that leadership tenets can be used as flexible platforms for governance, enabling a system to cope with complexity and uncertainty. He prefers the use of a decentralized command system (AT).

AT as a military governance mode traces back to the nineteenth century. The Prussian-German General Staff System developed it under the auspices of Field Marshal Helmuth von Moltke the Elder, and the General Staff first discussed AT in 1888 in the Field Manuals of German Infantry (Leistenschneider, 2002).

The English-speaking literature prefers the technical terms “mission command” or “directive control” (Storr, 2003; Cullens, 1991), but the term *Auftragstaktik* (AT) is also widespread and in use as a Germanism (CGSC, 2014). Differences still exist in the understanding and application of AT, which are chiefly due to different military traditions (Milotat, 2000). The German Army Service Regulation 100/100 (BMVg, 2000) summarizes AT in just a few pages, outlining the tasks and requirements of superiors and subordinates, while the US Army dedicates a complete Army Doctrine Reference Publication (USDa, 2014) to “Mission Command”, reflecting its detailed framework. According to Chia and Holt (2008), the German interpretation of AT is based on knowledge-by-exemplification whereas the American mission command hinges on knowledge-by-representation.

The Imperial Japanese Army, for example, was an early adopter of AT and successfully applied AT in the Russo-Japanese War (1904–1905) (Immanuel, 1910). Experiences with AT and military management also seem – as in Western countries (Schössler, 2013) – to influence modern Japanese management culture, which emphasizes a bottom-up approach to

decision-making based on the human resources at the tactical and operational level as well as a high volume of cross-level communication within the enterprise (Yui, 1999).

Basics of AT

Defining AT. AT is the command and control system of the German Federal Armed Forces (BMVg, 2008). The German Army Service Regulation HDv 100/100 (BMVg, 2000, pp. 5–6) defines AT as follows:

Auftragstaktik is based on the mutual trust and demands made of each soldier, in addition to the conscientious performance of duty and willingness to achieve the objectives ordered, in that he is prepared to accept responsibility, to cooperate and to act independently and resourcefully in accordance with the overall mission.

The commander informs his subordinates of his intent, sets clear, achievable objectives and provides the assets required. He only specifies details on how the mission should be executed if measures serving the same objective have to be coordinated or if political or military requirements so demand. He grants subordinate commanders freedom in the way they execute the mission. This is a prerequisite for taking quick, decisive action and serves to strengthen the sense of personal responsibility. Military leaders are educated to utilize this latitude.

The style of leadership and supervision must take this into account. Auftragstaktik presupposes that a superior is willing to accept the occurrence of mistakes in the execution of the mission. Such tolerance, however, has its limits where the accomplishment of the mission and the lives of soldiers are unnecessarily put at risk.

The AT decision-making process. AT focuses on the relation between a superior commander and his subordinate, who interact with each other based on several core concepts (Hughes, 1993):

In the first step, the higher commander's intent (*Absicht*) lays out how the commander's plans for a campaign or battle should be conducted. The subordinate commander receives an order including the higher commander's intent and mission as well as the implied tasks (from his superior). The subordinate analyses the higher commander's intent and mission as well as the implied tasks and identifies his mission (*Eigener Auftrag*). Furthermore, he analyses the broad, local and geographical complexities of the situation (*Lage*). Together, the higher commander's intent and mission, the implied tasks, his proposed mission and the situation analysis produce a need for action (*Problem*). Taking all four criteria into account, the subordinate reaches a resolution (*Entschluss*) regarding the need for action, often based on several courses of action (*Handlungsalternativen*).

The following leadership principles and tenets are relevant for the (subordinate) commander (Uhle-Wettler, 1995):

1. an emphasis on speed in adjusting to new circumstances,
2. an emphasis on speed in maintaining the initiative,
3. making a mistake in a resolution is preferable to delaying or failing to reach a resolution,
4. a willingness to accept responsibility for independent decisions and

5. the authorization to abandon a task when necessary as long as the subordinate (commander) acts according to the higher commander's intent.

Subordinates are explicitly allowed to act independently as long as they are doing so in accordance with the common intent as it relates to the situation or context. Acting independently also includes the acceptance of anomic behavior (Wittmann, 2013) as long as this behavior complies with the common intent of the superior leadership. According to the German Joint Service Regulation 10/1, superiors “must sometimes accept solutions that differ from their own” (BMVg, 2008, p. 612). This acceptance of anomic behavior in leadership processes makes AT unique among governance modes. For example, Vroom and Yetton's widely known leadership approach (Jago, 1995) takes into account a participative leadership style (Vroom and Yetton, 1973) but fails to accept anomic behavior in the form of a deviation from an order. In AT, the subordinate can nonetheless rightfully deviate from an order, but only when the following criteria are met (Oetting, 2000):

1. The situation significantly changes or a completely new situation occurs.
2. Immediate action is urgent.
3. The higher commander is not currently available.

Also, in the case of deviation from an order, the subordinate must inform the higher commander as soon as possible but is not required to supply a justification (Kortzfleisch, 1969). These emergent leadership characteristics underline the non-linear nature of AT in responding to the non-linear and chaotic character of war and conflict situations. Figure 1 summarizes the decision-making process and all the possible AT decision cases.

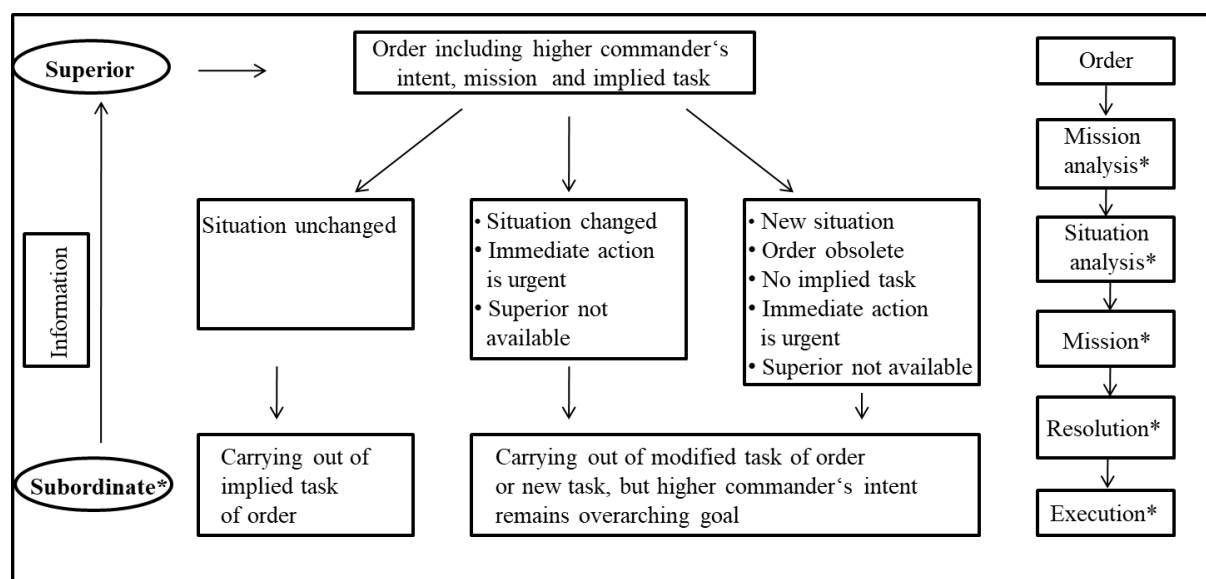


Figure 1: Decision-making process and decision cases of AT (Wittmann, 2012, p. 42)

AT as a comprehensive management and leadership concept incorporates characteristics such as participation and motivation, complexity reduction, mutual learning (Curcio, 2004) and non-hierarchical deviating behavior, including management behavior (as in deviation from the order). The application of AT cascades over all hierarchy levels and also guarantees the participation of all hierarchy levels. The common intent works as an overarching goal and framework for all hierarchy levels and enables military leaders to adapt quickly to situational changes while simultaneously remaining focused on the common intent. These characteristics

of AT enable reasonable exceptions to the traditional top-down execution system of orders (Moltke, 2000) as well as quick adaptation to situational changes in the environment. Additionally, they foster situational and organizational awareness and flexibility in the hierarchical military system.

Heterarchical nature of AT. The concept of heterarchy as a form of coordination (from the bottom up) within transaction theory (Bellmann, 2001) sheds light on the non-hierarchical character of AT mentioned by Simpkin (1985) and Oetting (2000). Hierarchy in terms of transaction theory represents a monolithic business organization with a high degree of specialization under stable environmental conditions. In contrast, a heterarchy comprises business organizations under unstable environmental conditions organized in networks with polycentric structures achieving competitive advantages and being led by one or more enterprises (Sydow, 1993). It reflects the principle of fluctuating hierarchical relations that change relative to the situation and context (Bellmann, 2001). Analogous to the military context, this is the case when a situation changes and a subordinate deviates from an order. The causes of deviation are often (situational) information, knowledge or competence advantages of the subordinate. Many advantages of heterarchy (Reihlen, 1998) justify the application of AT:

1. autonomy and self-control,
2. a high level of intrinsic motivation of the participants,
3. the exploitation of leeway through initiative, curiosity, improvisation and exploration,
4. commonly agreed tenets such as openness, tolerance, honesty and comradeship,
5. the creation of an organization based on mutual trust,
6. the reduction of transaction costs (supporting the economic minimax principle) and
7. a high level of ability to learn (from each other).

The disadvantages of a heterarchy, which are also relevant for AT, are as follows (Reihlen, 1998):

1. a high number of participants may make decision-making more difficult, slower or impossible,
2. a high and costly level of necessary qualifications and competences.

In (military) decision-making, heterarchy-based decisions can influence strategic thinking, strategy formulation, monitoring and controlling. This is because the information, knowledge and competences available to the subordinate experts rise to the strategic level and infiltrate the decision-making process.

Unity of command may be an ideal principle of leadership, but only stable environmental conditions can guarantee the monolithic and monocentric qualities a hierarchy would need to achieve this. In uncertain and dynamic environments, the relevance of an organization's heterarchical characteristics increases. Leadership in heterarchies temporarily requires the replacement of the unity of command of traditional hierarchies and focuses on an overarching goal (common intent). Therefore, it is necessary to situationally adapt the unity of command principle to "unity of common intent", this being the framework for action during heterarchical processes. This facilitates quick adaptability to environmental conditions, fosters the ability of the institution to innovate and change, and improves the quality of the military institution (Schmidtchen, 2006), all of which highlights the high degree of effectiveness that AT has as a governance mode.

Examples of applying AT in heterarchical situations. At the Battle of Colombey in 1870, Major General von der Goltz, commander of an infantry brigade, noticed an unexpected retreat by the French troops at Metz, France. He did not wait for a new order but decided to attack the French forces immediately in order to spoil the plans of the French General Staff (Goltz, 1891). He acted according to the common intent of the German General Staff to try to hold the French forces at Metz until reinforcements arrived (Uhle-Wettler, 2006).

First Lieutenant Rommel (1995) described his role as detachment commander during his attack against Italian defence positions at the Monte Matajur in 1917. He received an order which no longer matched the current situation, and, taking the current situation into account, he decided to exploit the opportunity to continue the attack in order to successfully occupy the peak of Monte Matajur. This action led to the breakdown of the Italian defence lines in the area and was a prerequisite for the breakthrough of German and Austrian forces in the Italian theatre (Häußler, 2008).

Widder (2002) and Dupuy (1977) exemplified the application of AT with the occupation of Fort Eben-Emael in Belgium at the beginning of the Western campaign by a platoon of German airborne pioneers in 1940. Despite the temporary absence of the platoon leader, First Lieutenant Witzig, due to an emergency landing at the beginning of the operation, the platoon, under the command of a non-commissioned officer, Staff Sergeant Wenzel, independently executed the mission successfully under his own initiative according to the common intent (Schriftleitung, 1954).

AT in the context of management and leadership. The heterarchical governance mode of AT as a command and control system has strong links to management and leadership (Crevelde, 1985), and it is part of management as well as leadership in military organizations. AT's decision-making process is similar to standard management processes containing target setting, planning, decision-making, execution and control (Ulrich and Fluri, 1995).

Management is defined on the one hand in an institutional manner, as a group of managers leading a (business) organization and its employees, and on the other in a functional manner (Ulrich and Fluri, 1995). Management functions include corporate policy, management philosophy, planning, controlling, organization, leadership and management development (Ulrich and Fluri, 1995). Three aspects distinguish military management from civil management (CDA, 2005):

1. the application of large-scale lethal force or the threat of this force,
2. commanding subordinates to go into harm's way and
3. dispensing specific military justice with substantial power of punishment.

Leadership is part of management and a distinction can be made between the leadership of an organization (leading the organization) and the leadership of people (leading people) (CDA, 2005). The latter is often what is meant by 'leadership' within organizations and involves influencing others to act in accordance with a common intent or a collective purpose (Ulrich and Fluri, 1995).

Business organizations and the management and leadership challenges they face in the context of the competence-based view

Business organizations in volatile and dynamic environments

The survival of business organizations in dynamic, volatile and highly competitive environments requires a high degree of adaptability and changeability on the part of both the organizations and their management. Bellmann (1995) emphasizes that, while optimizing the structure of a business organization is not absolutely essential, the adaptability of the business organization is a *conditio sine qua non* for its survival. An appropriate way of dealing with unexpected, unusual experiences based on frictions is becoming increasingly important in the management of business organizations (Garud, Dunbar & Bartel, 2011).

In contrast, (traditional) business organizations are often based on monolithic and hierarchical structures suitable for stable environmental conditions. The car manufacturer GM is a valuable example of a failure to adapt to environmental conditions, necessitating a later reorganization under US bankruptcy law (Chapter 11) (Lutz, 2013a; Altman, 2008). Studeny et al. (2017) argue that the Volkswagen emissions scandal, which came to light in September 2015, is a consequence of Volkswagen's failure to build up an economically and environmentally sustainable business model and its rigid focus on global market leadership combined with a centralistic management approach (Wimmer, Schneider & Blum, 2010; Lutz, 2013a; Hucko, 2015). However, environmental dynamism and complexity require high levels of flexibility, decentralization and delegation in organizational structures, management and leadership. Dunbar and Garud (2009) analyse the ill-fated case of the Columbia shuttle flight, where a strong and rigid focus on safety and meeting schedules led to a normalization of risk and a failure to exploit the distributed knowledge in the NASA organization to solve the non-routine foam shedding problem. The NASA specialists did not feel a responsibility to act and failed to escalate relevant information to the senior management because of the top-down, bureaucratic management style. Silicon Valley start-ups and new tech companies, such as Google and Uber, seem more adaptable to unstable environments. They tend to project themselves as organizations that focus on decentralization, autonomy and competence-based hierarchies based more on peer accountability than authority-based accountability (Ismail, Malone & Van Geest, 2014); however, recently there has been a great deal of criticism regarding their often aggressive management culture and discriminatory working environments (Lashinsky, 2017; Griffith, 2017).

Sanchez (2012) concludes that a selected set of competitive strategies and organization architectures are relevant when attempting to align to unstable environments. Consequently, as a part of strategic management, the strategic logic of an organization is the operative rationale. Strategic logic includes the management processes coordinating the assets, resources and competences, and incorporates, among other elements, the decisions, rules, norms and procedures necessary to achieve the organization's goals (Sanchez and Heene, 1997b).

In the following, the competence-based view is taken as being representative of up-to-date management research on business organizations in volatile environments (Wolf, 2013). This is important because "the competence perspective is making plain the need for theory that more fully recognizes the realities – above all, the uncertainties – faced by managers and organizations in the practice of strategic management" (Sanchez and Heene, 1997b, p. 5).

Basics of the competence-based view

The objective of strategic management in the competence-based view is to build up a competent organization which creates the value necessary to maintain the activities of the organization (Sanchez and Heene, 2004). The competence-based view focuses on the assets, resources and competences of an organization (Freiling, Gersch & Goeke, 2008). “Competences mean a repeatable, non-random ability to render competitive output” (Freiling, Gersch & Goeke, 2008, p. 1151). Organizational competence is the ability “to sustain coordinated deployments of resources in ways that help the organization to achieve its goals” (Sanchez and Heene, 2004, p. 7). The competence-based view considers firms as open systems which define strategic goals that contain a mix of objectives specific to each firm (Sanchez and Heene, 1997a). Competence-based competition requires an immanent corporate entrepreneurialism based on a permanent learning process regarding leveraging and building new competences more effectively (Sanchez and Heene, 1997a).

Three pillars of the competence-based view emerge for business organizations in volatile and competitive environments responding to market and technological opportunities and aligning to environmental changes:

1. strategic flexibilities for decision-making,
2. control loops to manage adaptation to dynamic environments and
3. gaining competitive advantages with organizational competences.

Strategic flexibilities for decision-making. A promising approach to strategic decision-making is to identify and create strategic flexibilities in order to adequately respond to market and technological opportunities (Sanchez and Heene, 1997b). The purpose of these flexibilities is to align organizational architectures to dynamic environments. Strategic flexibilities mostly appear as product (offer) flexibilities leading to strategic options, which enable a firm (Sanchez, 2001):

1. to initiate technological and organizational learning in order to improve customer-focused product features and functions,
2. to test and analyze market reactions and technological progress regarding modular architecture elements (e.g. component-based functions and features) and
3. to develop and introduce products into markets based on inherent modular architectures that take advantage of market and technology opportunities.

Strategic flexibilities very much depend on resource flexibilities based on the availability of multi-use resources as well as the coordination and cognitive flexibilities of (strategic) managers (Sanchez and Heene, 1997b; Sanchez, 2012).

Cognitive flexibilities are, on the one hand, flexibilities allowing the development of new strategic logics for value creation by integrating new competences and, on the other, flexibilities enabling the development of management processes for the application of new strategic logics (Sanchez, 2012).

Coordination flexibilities comprise the ability of strategic managers to coordinate the strategic use of existing and new competences in an effective manner to create value (Sanchez and Heene, 1997b).

Control loops to manage adaptation to dynamic environments. Strategic managers continually have to measure the level of their organization's goal achievement and identify strategic gaps in volatile environments. There are strategic (higher-order) and operational (lower-order) control loops to manage adaptation (Sanchez and Heene, 1997b):

1. higher-order control loops are based on what is often external strategic data focusing on fundamental changes in strategic logic and management processes by strategic managers.
2. lower-order control loops are based on current operating data and focus on incremental, often product-related changes by mid-level managers.

Strategic managers earn high autonomy and early involvement during the strategic stages by installing strategic flexibilities and creating strategic options. Conversely, mid-level managers chiefly focus on executing operational and tactical tasks (Sanchez, 2013). Sanchez and Heene (1997b, p. 36) consider that “organizations managed through lower-order control loops are likely to be unable to identify opportunities to become product innovators, to adopt new technologies, or to experiment with new organizational forms”. Consequently, strategic learning and knowledge management incorporate the effective creation and management of knowledge, which are predominantly tasks for strategic managers (Sanchez, 2013).

Gaining competition advantages with organizational competences. Managing organizations and systemic organizational change require substantial organizational competences on the part of managers. Organizational competences embody a specific set of abilities, such as resource coordination, recognition and appreciation, problem and, in particular, complexity solving; these abilities distinguish the organization from its competitors (Schreyögg and Kliesch, 2005) and allow it to gain competitive advantages in dynamic and uncertain environments. For example, the effective management of modularization and innovation is a flexible management concept and builds an organizational competence (Sanchez, 2013). A key issue when it comes to advancing the understanding of building and leveraging organizational competence (Sanchez and Heene, 1997a) is the better integration of strategic learning and knowledge management.

The management and leadership challenges identified by the competence-based view

Sanchez and Heene (1997a) identify four management and leadership challenges which can limit the ability of managers to build and leverage new competences and retire existing competences:

Highly ambiguous data challenge managerial and organizational cognition. One of the management and leadership challenges of the competence-based view relates to better understanding how managers recognize market and technological opportunities to build or retire current competences, especially in volatile environments. Additionally, benchmarking and environmental scanning, as capable tools for obtaining the external strategic data that is a prerequisite for a situation analysis of business opportunities, suffer in highly volatile environmental conditions. However, highly ambiguous data challenge the recognition and perception of business opportunities by managers in dynamic environments. In particular, the limited recognition of unexpected and unusual incidents and frictions caused by business opportunities create high management risks to the business organization. The formulation of strategic plans derived from the strategic logic is a challenge for (strategic) managers, for example, when the necessary data are highly ambiguous and when it is difficult to acquire urgently required assets in time (Sanchez and Heene, 1997b). These effects also make the

identification and evaluation of strategic flexibilities and options for building new competences difficult, cause information asymmetries and often lead to mediocre management performance.

Limited governance mechanisms in firms as open systems. The improvement of the understanding of governance mechanisms in firms as open systems is a core challenge for management and leadership in the competence-based view. In particular, the evaluation and coordination of assets and resources in firms as open systems and their transformation into new competences in dynamic environments are of great interest for managers. However, the model of the firm as an open system (Sanchez and Heene, 1997a) contains some pitfalls that it is necessary to address:

1. The premise of the competence-based view that only the higher-order loops enable fundamental changes, while the lower-order loops enable incremental changes, does not fit with reality, where bottom-up market and technological opportunities, for example, open innovations (Chesbrough, 2003), are also evaluated and coordinated effectively by mid-level managers.
2. The competence-based view postulates that strategic control loops cannot be changed more easily than operational product-related loops, but this contradicts experiences in industries with long development cycles such as the automotive industry (Mildenberger and Khare, 2000). As a response to changes in the competitive environment, traditionally functional organizations in the automotive industry have transformed into product and process-related organizations with a strong focus on effective and efficient product development (Wheelwright and Clark, 1992).
3. The control loop concept is more of a two-tier hierarchical system, clearly separating the strategic from the operational level and limiting the comprehensive evaluation and coordination of assets and resources, than an integrative governance mechanism functioning for firms as open systems which also have to connect with other firms in order to exchange competences.

Limited coordination. In the competence-based view, coordination flexibility plays a crucial role in competence building and leveraging in dynamic environments. However, the understanding of the coordination of building and leveraging competences in and between business organizations is incomplete. The competence-based view encompasses several pitfalls:

1. The internal coordination processes for competence building and leveraging between strategic and mid-level managers are strongly limited in the control loop concept.
2. The modularity approach has a strong centralistic touch; this is a prerequisite for a top-down only exploitation of the full range of market opportunities and technological possibilities directed by strategic managers. But realistically, the modular approach cannot solely be a top-down approach because this would reduce adaptability to market and technological requirements and opportunities and neglect bottom-up developments, for example, retail staff proposals, open innovations.
3. Additionally, the proposal to implement and maintain a modular development process with absolute discipline (Sanchez, 2013) does not fit with the creativity, initiative and leeway required in a flexible organization to meet the market test for competence (Sanchez, 2001).

Neglecting strategic learning and knowledge management on lower hierarchical levels.

Strategic learning and knowledge management are fundamental parts of the competence-based view. A deep understanding of organizational learning and knowledge management is a prerequisite for building and leveraging organizational competences. Learning generally appears multi-directionally. The competence-based view offers concepts that neglect the fundamentals of learning cognitions:

1. Learning effects on the strategic manager level result in the neglect of both learning effects on the lower hierarchical levels and learning interdependencies across all levels of the hierarchy. Consequently, new ideas or ways of dealing with unusual experiences that come from lower levels often are ignored, blocked or underestimated.
2. Limited access to strategic learning and knowledge management by mid-level managers reduces the coordination and cognitive flexibilities of strategic and mid-level managers.
3. The gap between strategic and mid-level managers can also cause a lack of common cultural values and goals, hinder the effectiveness of governance modes and reduce management performance across all hierarchy levels because of information and knowledge asymmetries.

In contrast to his favorable posture towards strategic managers over mid-level managers, Sanchez (2012) surprisingly postulates a shift from hierarchy-oriented to collaborative management concepts, thus reducing the gap between the management levels.

How can AT address the management and leadership challenges facing business organizations identified by the competence-based view

The four identified management and leadership challenges in the competence-based view relate to managerial and organizational cognition, governance mechanisms in firms as open systems, coordination and strategic learning, and knowledge management. AT can address the challenges facing business organizations in the competence-based view as follows.

How can AT improve managerial and organizational cognition in order to identify business opportunities for building new competences. AT is an approach for coping with highly ambiguous data supported by a mix of hierarchical and heterarchical elements in order to improve decisions on business opportunities. The close interaction between the superior and the subordinate plays a crucial role in the communication and common understanding of business opportunities as prerequisites for the build-up of competences. AT's specific view on the superior's role is essentially that they should grant leeway for subordinates' decisions and actions concerning business opportunities and be ready to accept mistakes made by subordinates in independent actions such as identifying and exploiting business opportunities. According to the AT principles, managers should only intervene when the accomplishment of the strategies and business plans or the working conditions of the staff are put at risk. These principles enable subordinates to successfully deal with unexpected, unusual incidents and frictions concerning business opportunities and easily communicate their experiences across hierarchical levels. This means that the exploitation of (business) opportunities initiated by bottom-up knowledge and the competence advantages of subordinates (e.g. R&D and retail staff) can be a core feature of the application of AT in business environments. During the decision-making process of the subordinates, for example, retail staff, a deep situation analysis makes it possible to weigh up both the relevance of the available highly ambiguous data and the situation on the ground. This lowers the decision risks for strategic managers and

leads to a quicker and more situational evaluation and coordination of assets and resources, as well as a quicker transformation into new competences. The subordinate's own resolutions to the need for action, including the permissible degree of deviation from the superior's mission, significantly improve the identification and evaluation of strategic flexibilities and options based on business opportunities. AT's emphasis on the unity of common intent also enables managers and staff to better adapt strategic flexibilities and options to environmental changes while maintaining the firm's set of competitive strategies and organization architectures. The firm remains governable in unstable business environments. Consequently, businesses must prioritize the knowledge and competences of the qualified rank and file in the decision-making process, for example, regarding business opportunities; this works through participation in decision panels such as simultaneous engineering team meetings and workshops. The focus of management processes is to be found in the lower management levels, guaranteeing adaptability to rapid environmental changes. AT improves the relevant cognitive flexibilities, which focus on lower management levels better recognizing business opportunities in volatile environments, and the coordination flexibilities required to anticipate the ideas and initiatives of customers in order to better coordinate assets and resources for the build-up of competences.

How can AT improve the understanding of governance mechanisms in firms as open systems. AT embodies a transmission belt across all levels of a hierarchy, guaranteeing the close participation of subordinates in the decision-making process and improving the comprehensive evaluation and coordination of assets and resources. AT applies a limited and comprehensible vocabulary, keeping communication simple across all levels. Consequently, the common tenets, based on a common understanding, simplify the comprehensive evaluation and coordination of assets and resources in dynamic environmental situations. These aspects of AT bridge the gap between strategic managers and operational managers, as well as staff, which leads to a better common understanding and a better corporate identity. AT's strong emphasis on informal aspects of governance strengthens the bonds between strategic and mid-level managers and staff. This tacit knowledge of informal aspects is a prerequisite for a collaborative working and management environment in firms as open systems and distinguishes the business organization from its competitors. These close and cooperative bonds guarantee the adaptability of the governance mechanisms, which is necessary to master the challenges of uncertainty and complexity in dynamic high-pressure environments – in the military as well as in the business sphere. This also makes comprehensive evaluation and coordination of assets and resources across the boundaries of the firm more effective. Here, AT is also very helpful due to its timeless tenets nurturing cooperation and communication with other firms. All these aspects lead to a better understanding of the coordination of building and leveraging competences in and between business organizations.

How can AT improve understanding of the coordination of building competences. AT, with its heterarchical characteristics, improves the coordination of existing and new competences on the part of managers in a quick and effective manner, enabling value creation through cross-level communication and participation. The application of AT within the modular approach makes the modular approach more adaptive and permeable for bottom-up ideas and the build-up and integration of new competences in and between business organizations. Another aspect is linked to the character of development processes, which start with a feasibility study and become increasingly concretized in the run-up to the realization of the project. During this period, process changes have to be evaluated in time and must comply with the business plan (common intent) in order to be accepted and integrated into

the project configuration. So new ideas from the markets, the customers or technology must be evaluated and integrated into the project without additional costs and according to the business project plan. If this is not possible, the concept will be postponed for later projects. For example, development teams or simultaneous engineering teams have the leeway and permission to foster their own ideas and concepts and escalate them to the management board for perusal and final approval, closely supported by the financial department. There are many product offer examples initiated from the bottom up in the automotive industry by suppliers and inventors, such as driving assistance systems like cruise control and anti-lock braking systems (Teetor, 1950; Lawes, 2014), which enlarge the product configuration with new competences and significantly enhance customer value. This underlines that disruptive innovations on the systems and component level from the bottom up, such as by suppliers and internal purchasing department staff, could also have an impact on the strategic logic and management processes of a firm. Early supplier integration and open innovation tools require substantial and sustainable changes in the strategic logic and management processes.

How can AT nurture strategic learning and knowledge management. The self-regulation, initiative, self-organization and motivation incorporated in the AT concept highlight the better mutual understanding among participants from all hierarchical levels, for example regarding business opportunities. These comprehensive communication processes fuel strategic learning and knowledge management across all levels of the hierarchy with bottom-up information. Garud, Dunbar and Bartel (2011) propose a narrative development process that enables continuous learning for business organizations based on unusual experiences, exemplified by the 3M Corporation. This is very close to the Prussian-German military procedure of documenting and evaluating combat experiences for organizational learning, which has been transferred into army regulations and military publications (Samuels, 1995; Moltke, 1865).

The leadership principles and tenets of AT follow the common sense understanding of an organization by learning and training, and support the build-up and leverage of organizational competences based on its collaborative approach, distinguishing the business organization from its competitors. In particular, AT's acceptance and tolerance of anomic behavior by subordinates when working towards the common intent of the senior management improves the build-up of organizational competences, for example by enhancing the management of modularization and (open) innovation.

The effective and consistent application of AT incorporates decisions made on the lowest competent level, leading to better resource coordination and improved problem and complexity solving in uncertain environments. Other results of AT include a higher level of recognition and appreciation. These aspects lead to a better understanding of organizational learning and knowledge management through close and deep participation by all levels of the hierarchy. During the technical development process of industrial business organizations, mid-level managers and staff have continual and intensive contact with suppliers and development partners and exchange ideas and knowledge. Strategic managers have to support this exchange and motivate staff and mid-level managers to place an emphasis on speed when it comes to adjusting to new technological and business circumstances and maintaining the initiative in cooperation and coordination processes with suppliers and development partners. They also need to communicate that it is better to make a mistake in a resolution than to delay or not reach one and must be willing to accept responsibility for independent decisions as long as they are in accordance with the strategy and the business plan. The systematic collection and evaluation of the relevant information and knowledge in this exchange is

useful for strategic learning and knowledge management, especially for new strategic development projects or lessons learnt procedures.

Conclusion and further research

Dynamic und uncertain environments present challenges for business leaders and the governance of businesses. This encourages entrepreneurs and senior managers to look at other domains confronted with similar developments, such as the military sphere. Despite some management approaches addressing managing incremental change, AT possesses interesting characteristics in terms of its adaptability to frictions and the way it can be applied in dynamic and uncertain business environments. The exploration in this paper underlines the contribution of AT to the competence-based view and, in a second step, the improvement of business organizations in volatile environments. The improvements to the competence-based view that can be made by AT focus on the following points:

1. A better identification and quicker evaluation of strategic flexibilities and options.
2. A quicker and more situational evaluation and coordination of assets and resources as well as a quicker transformation into new competences.
3. A better understanding of the coordination of building and leveraging competences in and between business organizations.
4. A better understanding of organizational learning and knowledge management through close and deep participation from all levels of a hierarchy.

All these points improve the ability of businesses to quickly adapt to environmental conditions and exploit significant business opportunities in the form of technological and market opportunities. These may include identifying new customer needs, new market niches and new open innovations with the help of information from the bottom of the organization and by empowering mid-level management and staff. Further research is needed on:

1. competitor and customer-oriented research of needs by staff and mid-level management in order to better exploit business opportunities and
2. technological brainstorming by technical and engineering staff in cooperation with suppliers, development partners and (potential) customers.

The improvement of the competence-based view with the collaborative management and leadership approach of AT supports business organizations in better, faster and more situational adaptation to business opportunities, with a high level of participation by mid-level management and staff, and in a highly volatile environment. AT supports the build-up and leveraging of organizational competences, which distinguish the business organization from its competitors. AT supports the enhancement of the competence-based view, enabling it to more fully recognize the realities of an uncertain and volatile business world and become more strongly oriented to the market environment (Wolf, 2013). Recommendations for future theory building and research focus on two approaches:

The first is the (theoretical and conceptual) integration of AT as a comprehensive leadership and management concept into the competence-based view, which still lacks effective coordination and governance modes, especially in dynamic and uncertain environments.

The second, taking an opposite view, is to analyze the contribution that can be made by the competence-based view and other organizational research approaches, for example game

theory and new institutionalism, to AT as a comprehensive leadership and management concept.

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