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Mechanisms of Teleological Change**

Teleology is used as fundamental principle in describing and explaining actions. The basic concept of teleology is the assumption of an actor engaging in intentional, goal-oriented behavior. This article describes how teleological mechanisms work and show changes can be effectuated. A short case description of strategic, technological and organizational change illustrates some fundamental characteristics of teleological actions in real economic situations.

Key words: **teleology, change, strategic change, technological change, organizational change**

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1. Definition of terms and the character of teleology

Teleology – from the Greek telos (goal, purpose) refers to an actor's purposeful, planned action. Teleology means conscious goal-orientation toward a defined aim. Action is considered to be intentional acting or working in contrast to mere reaction. Teleology is thus fundamentally different from simple stimulus and response relationships. In contrast to "causality" in the technical-mechanistic sense of the word, it means formation, or human-intended (voluntary) shaping, often connected with processes of change.

Voluntary action has been a topic of interest for psychologists, notably for Lewin (1929) and Ach (1936), since the beginning of the 20th century. For a long time however volitional psychology was considered to be unscientific. Cognitive psychology took up this topic again, and studied problems of action control (e.g. Norman/ Shallice 1986) and self-reflection (e.g. Rosenblueth/Wiener/Bigelow 1943; Dörner 1989), focusing on the individual and his teleological behavior, with behavior understood as all steps in decision-making and action together with its accompanying emotional, cognitive and conative processes. In an economic context teleological approaches to behavior are discussed especially in the fields of organizational learning (March/Olson 1975), decision-making (Chakravarty/Lorange 1991) and strategic planning (Mintzberg et al. 1976; Nutt 2002). Teleological action as related to organizational change processes has the following characteristics:

Development and formulation of goals: Referring to the seminal work of Heinen (1971: 51), goals can be considered as the "general imperative of the preferable". In order for an actor to consciously formulate a goal, there has to be a particular stimulus, which according to the results of the cognitive motivation psychology develops out of an interaction between internal dispositions (motives) and the perceived environmental situation (Puca/Langens 2008: 224). For example an actor might become aware of his dissatisfaction with a prevailing situation, e.g. developments in his surroundings, such as a new legal situation or organizational changes, such as a new production technology. Crucial for a teleological perspective of goal-setting is that it is based on a relatively well-defined decision-making situation, in which the actor has sufficient information, i.e. functional knowledge. This allows the actor a realistic evaluation of his goals, as well as the chances of them being implemented. In order for a goal not to remain in a stage of pure imagination, the actor needs to take action in conscious pursuance of the goal – the will to do something - is necessary. So he has to find the willpower and the energy to move this goal beyond the stage of pure imagination to have a realistic chance to reach the goal. More recent findings, especially from neuropsychological researchers of motivation, assume that the intensity and persistence with which a goal is pursued, i.e. the strength of motivation, is dependent on so-called "emotional anticipation". A positive emotional anticipation (the expectation of more positive than negative effects) – similar to the actual perception of a reward – is accompanied by an increased release of dopamine (the "happiness" hormone) in the central nervous system (Walter et al. 2005: 368; Harmon-Jones/Winkielman 2007: 3). According to studies by Depue/Collins (1999), the concentration of dopamine in specific regions of the brain determines the conversion of motivation into action, thus making it an engine of goal-oriented action.

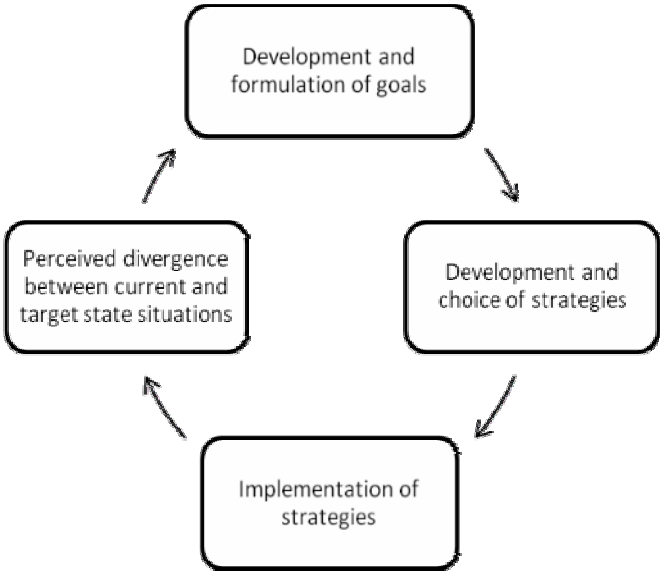
Identification and choice of strategy and actions to achieve a goal: Teleological approaches often assume the existence of a rational actor, who, according to "expected utility theories", calculates risks and then chooses those strategies that best allow him to achieve his goal (Puca/Langens 2008: 197). The actor is most capable of doing this if a) there is no interest or goal conflict; b) there are enough resources available to bring about changes and c) he is in a well-structured situation (March 1994: 104). In reality however there are often deficits to this theoretically ideal situation, including limited cognitive abilities; incomplete information; decision-making based on experience of what is considered appropriate rather than on the logic of consequences; conflict within multi-person decision-making as a result of inconsistent rules and identities. Given these findings, Simon pointed out already in 1957 the impossibility of unlimited rationality in real decision-making processes and introduced the concept of "bounded rationality" to decision-making theory. Today most teleological-oriented approaches assume bounded rationality, that actors "satisfies" rather than optimize, or admit the use of simple and fast decision-making heuristics that do without the use of all available information. In the teleological perspective actors are able to freely shape their own strategies in accordance with their goals, thereby opening up new paths. However in practice there are limits to freedom of action. The environment of the organization and its resources, e.g. knowledge, time, money etc., can all limit the range and effects of action. In most instances actors do not violate legal requirements or commonly acknowledged norms and values or environmental requirements; and often they make use of them to reach their goals. They operate within an institutional setting and are influenced by its imperatives.

Implementation of strategies: So far, teleological action has been considered primarily as an individual psychological concept that concerns an individual action rationality, in which the individual's willingness to act and the execution of that action is in the foreground. This is a quasi-monolithic action perspective, in which a frictionless implementation of action and plans is emphasized. The assumption that systems can be created in their totality, which can also be found in normative decision-making theory, is a classic characteristic of synoptic planning rationality. The postulate of such a planning ideal is nevertheless questionable, both for theoretical and practical reasons. Popper (1969: 63) already pointed out that a macro perspective in which social totalities are analyzed, planned, purposively constructed and realized requires a special still not invented kind of social technology. The economist Myrdal (1959) also stressed that the fiction of a "collective subject" is just as unrealistic as the idea that problems confronting a system can be solved by instrumental actions of individual members, as if action rationality and systemic rationality were the same. From a practical point of view there are many examples for a divergence between planning ideals and reality. This can be clearly seen for example in repeated critic about the assumed close link between strategic and operative planning (Lewis 2000; Kaplan 2001: 3). Especially in change processes operations seldom proceed as planned. "Overall, planned change is not impossible, but it is often difficult. The key point is that change is an ongoing process, and it is incorrect to think a visionary end state can be reached in a highly programmed way" (Paton/McCalman 2008: 9). Rosenblueth/Wiener/Bigelow (1943: 22) speak of a feedback process that ultimately leads to goal-oriented action not fol-

lowing any automatic sequence of events but to actors adapting the actions they have chosen, if necessary dynamically and flexibly, to account for disruptive influences.

These characteristic activities mutually influence each other and can be depicted graphically as a cycle. The general scheme of the teleological mechanism is shown in figure 1.

Figure 1: Teleological mechanism as an action cycle



From a teleological perspective, the activities of the actors are focused on objectives, or target state. If a conscious awareness of a divergence between the current state and the targeted state affects the relevant motives, then a decisive impulse to goal-setting is released. To become aware of divergences and to develop goals, a well-defined decision-making situation is necessary, so that the actor possesses sufficient specialized knowledge to set goals that are not based on unrealistic assumptions. The nature of the goal determines the strategic development and determines the assessment. The strategy that offers, in regard to the goal criteria, the best chances of realization will then be implemented. In the following it is shown how in strategy management, in technology development and in organizational structure change is initiated by teleological action.

2. Strategy and teleology

Strategy describes an organization's alignment with its external environment. It is defined as the "fundamental pattern of present and planned resource deployments and environmental interactions that indicates how the organization will achieve its objectives" (Mintzberg et al. 2003). Garud/Van de Ven (2002: 211) describe the teleological perspective as a typical approach to interpreting strategic change. This is not surprising if we consider that purposeful, goal-oriented decision-making and action are principles of strategic planning as it was developed in the 1960s and as it still appears in

most management strategy textbooks of a normative orientation (e.g. Steinmann/ Schreyögg 2000; Bea/Haas 2001; Hungenberg 2008). Strategic change is described as a sequential, planned search for optimal solutions for well-defined problems (Ansoff, 1969; Mintzberg et al. 2003) and "can be defined as a difference in the form, quality, or state over time" (Van de Ven/Pool 1995: 512) in an organization's alignment with its external environment.

Classical approaches toward the development of goal-oriented strategies at the business segment level are, for example, the market growth/market share portfolio developed by the Boston Consulting Group (BCG) and the product-market matrix from Ansoff (1969). While the BCG approach sees strategic development and change from a perspective of risk pooling, Ansoff (1969: 219) has developed a strategy matrix that builds on the use of synergy potentials.

Figure 2: Four product-market combinations according to Ansoff

	present market	new market
present products	market penetration	market development
new products	product development	diversification

Ansoff recommends a change of strategy when the adaptation potential of a strategy to the external environment is exhausted. His framework proposes a sequence of changes in strategy, beginning with using synergies in existing markets (market penetration) and expanding to new markets (market development) to developing new products for familiar markets and, as a last resort, a high risk strategy, in entering new markets with new products (diversification). This sequence is known in the literature as the "Z strategy" and is shown in Figure 2.

The strategy matrix provides a typical example of teleologically oriented change: If management in a business segment sees that there are divergences from the defined growth goal, then it first analyzes more closely the divergences between the sought after target state and both the current and predicted future states by using e.g. gap analysis, potential analysis etc. This involves examining whether and to what extent the gap can be closed by adapting existing strategies. Empirical studies show that there is often considerable inertia on the part of actors involved in change processes and that they tend to hold on to an established strategy rather than undertake a fundamental change in strategy (Miller/Friesen 1984; Freeman/Boeker 1984; Boeker 1989). Consequently a fundamental change in strategy needs a special force to break the inertial tendencies of existing approaches to strategy. Alongside the available resources for planning and implementing a change in strategy, Ansoff sees as an important driver "the size of discrepancy between the objectives of the firm and the prospects of the current product-market position" (1969: 29). This approach of Ansoff represents a typical teleological action perspective. The extent of the divergence from the goal provides the motivation to take action. The strategy is adapted to the goal and not vice versa.

According to Ansoff's Z pattern, the market development strategy promises the next best synergies after a market penetration strategy has already been implemented (e.g. regarding demand behavior, product technology etc.). In order to assess how and to what extent these strategy alternatives are suitable for closing the gap to the target objective in a specific case, the actors need not only know-how and expert knowledge but also reliable information about the expected current and future developments in their company and its environment. The better defined a decision-making problem is and the better structured the decision-making situation is, the less the risk connected with the implementation of a new strategy, the greater the precision with which the advantages and disadvantages of a new strategy can be weighed against each other and the more persuasive this strategy will be. When the actors have taken a decision for a new strategy, Ansoff recommends (ibid.: 27) putting it in writing so as to clarify the new policy and its advantages, but also to gain support from relevant stakeholders in the company and commitment for the implementation phase. In addition written strategic plans assist the introduction of control processes in the implementation phase, divergences can be more easily recognized and the necessary adaptation measures can be taken more quickly.

In the Ansoff's product-market matrix basic elements of a teleologically induced strategic change can be identified, namely the possibility to perceive significant divergences from the target. These have to be so striking that a dynamic can unfold that allows the actors and the whole system to overcome its inertia. Furthermore, effective strategy alternatives should be identifiable and feasible to be implemented. It has to be pointed out that in all phases further mechanisms of change, such as for example the unplanned elements of serendipity (Weisenfeld 2009: in this volume) or dialectical contradictions, can influence the change process (Martin 2009: in this volume). Strategic change affects a variety of actors and departments in a company, who, depending on their expectations and claims, can promote or hinder the strategic change.

Examples for the Ansoff's Z pattern of strategy change can be seen in many business segments (including beverages, finished products, chocolate and confectionery products) of Nestlé, the largest food producer in the world. In the following case a closer look is taken at the brand "Smarties", which Nestlé acquired in 1988 together with its takeover of Rowntree Mackintosh and then transferred into its own product portfolio (Lebensmittel Zeitung 1995: 14). Using Ansoff's Z strategy matrix one finds a typical change of sales strategies: first (Strategy Phase 1, beginning 1989) the targeted product growth is generated by a strategy of market penetration, using marketing activities such as emphasizing television commercials, opening up additional selling opportunities throughout the year as well as entering seasonal business (e.g. Smarties Easter Eggs). This led to an increase in product use by regular Smarties customers and new customers were acquired (ibid.: 14). However, after ten years there were increasing signs of market saturation and a strategic target gap opened up. Considering the developments in the market environment as well as its own resources, it was decided to complement the strategy of market penetration with a strategy of market development. Beginning in 1998 (Strategy Phase 2) the company attempted to develop new markets by creating new sub-markets and product uses. Specifically it followed a market stretching strategy by introducing Smarties as a flavor for the McFlurry soft vanilla

ice cream (Food Service 1999: 6). Another strategy change in the direction of product development strategy could be seen in 2004 (Strategy Phase 3). In a strategic brand alliance with Haribo the company introduced a new product "Fruity Smarties", with the chocolate shell typical for Smarties filled with fruit jelly (Convenience Shop 2004: 30).

These successively implemented growth strategies for the Smarties brand point to a typical goal-oriented procedure. When signs of a strategic target gap became apparent, Nestlé reacted with a typical change of strategy, as depicted in the Z strategy pattern. For a teleologically induced change of strategy we can thus state that organizations follow goals and develop strategies to achieve the goals they have set themselves. As soon as strategic gaps are identified, companies tend to adapt their strategies (e.g. market penetration) or, if that does not hold sufficient promise of improvement, they change their strategies (e.g. new product development). It concerns a process of change that has been consciously planned and purposefully implemented by its actors in order to achieve an optimum adaptation of the company goals to the requirements of the environment and the given conditions of the organization (Rajagopalan /Spreitzer 1996: 50).

3. Teleology and technology development

Teleological action also plays an important role in the field of technology development. Schumpeter (1934) already emphasized that innovations are the result of goal-oriented, disciplined mental work. A look at the past shows that many technological inventions that triggered long-term changes in the economy and society were the result of conscious research and development by actors that were ready and able to take intentional and planned steps to realize their goals and visions (e.g. the invention of mechanical book printing by Johannes Gutenberg (1400-1468), the development of the combustion engine by August Otto (1832-1891) or the development of the calculator by Konrad Zuse (1910-1991).

A particularly well-known example is the GROWIAN project, a large wind farm commissioned and subsidized by the German government to generate electricity from the natural movement of air masses. The starting point of the project was an intense political discussion in Germany during the energy crisis (1973-74). This resulted in the federal German government explicitly formulating its political will in a new federal energy policy (Bulletin 4/1974) to promote new sources of energy. An energy policy study was commissioned to evaluate the feasibility of wind farms, with the expert commission advising on the current situation and the possibilities for taking action. In 1976 on the basis of these results it became the declared policy of the federal German government to build the "world-largest wind energy farm" (Pulczynski 1991: 20). In a goal-setting process that was strictly conceived of as a top-down process, the detailed goals concerning the specifications, for example the diameter of the rotor, the construction of the rotor blades, the height of the tower, the time frame (construction and test period of 32 months) and financial target (38.9 million marks) were created. The Jülich nuclear research center was commissioned to develop the design plans to achieve the goals set by the government, so that in 1978 the subproject to produce construction-ready plans was completed and the implementation phase could begin. The government agency funding the project established a construction and operating

company with a number of private energy companies as stakeholders. This was to ensure that at an early point in the project the initial lack of acceptance for the project by the energy users would change. A number of mostly technical problems meant that the plant was built with a delay of 11 months and was first put into operation on 25 January 1983. However, serious construction and material defects became immediately apparent so that the plant had to be shut down soon after the test start-up. These problems meant that in the first three years the plant had a total of only 420 hours of actual operation. Nevertheless GROWIAN is considered the prototype and impetus for modern wind technology and has made wind power something familiar at first to the people in Schleswig-Holstein and then in other German States. Ten years after the closure of GROWIAN in 1997 the image of renewable energy in Germany has changed considerably: in 2007 there was a total of 19,000 wind turbines producing almost 21,300 megawatts of wind energy.[1]

The example of GROWIAN documents a rationally planned path of innovation management, a form of technology development that is discussed in the literature as "breakthrough development" (Garud/Karnoe 2003). From their systematic design to their implementation, innovations are developed by purposeful action in order to achieve formulated goals. However, the case of GROWIAN also shows the limits of this approach (Pulczynski 1991: 55). The top-down planning method, with its dividing-up of the project into individual subprojects to be successively completed, was unable to deal with the complexity of the tasks at hand. The coordination and emerging learning processes regarding the new tasks did not take place and often weak points in the design that had been found after the fact were only dealt with insofar as they did not challenge past commitments and the original target. Garud/Karnoe (2003: 269) even suspect that the conscious striving for innovation limited the innovative strength so that actors who followed this approach in innovation management were actually less successful, not in spite of the fact that they were consciously searching for a breakthrough but because of it. However the case of GROWIAN shows plainly that and how a conscious and purposeful development of technology is able to create a lasting change in the world.

4. Teleology and organizational structure

That teleological change can also be found in organizations is shown in the highly regarded research of Alfred D. Chandler (1962). His empirical research findings are still discussed as the "structure follows strategy" thesis. After studying the introduction of divisional organizational structures, Chandler came to the conclusion that the organizational structure of a company follows the concept of strategy formation. This is nothing less than the teleologically induced approach to organizational change processes. Chandler's thesis has been repeatedly confirmed (Stopford/Wells 1972; Franko 1976; Wolf/Egelhoff 2001: 117; Sako/Jackson 2006). At the same time, further studies shows that the structure itself has an influence on strategy and these influences are less subject to conscious planning processes (Bower 1970; Amburgey/Dacin 1994;

[1] cf. http://www.welt.de/wirtschaft/article1129577/Groesster_Misserfolg_und_Helfer_der_Windparks.html

Wischnevsky/Damanpour 2008). Although this puts Chandler´s thesis into a different perspective, examples supporting it can still be found in practice, such as for example the reorganization of SAP. The perception and analysis of changes in its environment made SAP decide at the beginning of 2000 to pursue a growth strategy with three main strategic options (Vetter/Timmo/Petry 2008: 225):

- Developing new customer segments, attracting especially medium-sized companies through offerings of pre-configured solutions for business process-organization,
- Extending the product portfolio, increasing the number of individual solutions for business functions, e.g. supply chain management, customer relationship management, product lifecycle management,
- Positioning itself as a system provider that no longer offers its customers isolated solutions but holistic, integrated problem solutions tailored to the industry (Best of Suite).

As a result of this organizational adaptation, two different types of units emerged: first, one that is exclusively responsible for industry-specific strategies and solutions and, second, one that bundles expertise for specific functions. This more or less emergent organizational structure however subsequently revealed weaknesses regarding, among others, business efficiency and also the desired market and competition orientation. In 2003 these perceived divergences resulted in the planning of a restructuring with the goal of creating a strategy-focused organization. For the development area in SAP this meant a fundamental change in existing organizational structures. The clear separation of industry-specific and generic (function-oriented) units was reversed and those units that were closely related were bundled in three clusters known as "business solution groups". The consolidation noticeably reduced the need for coordination. Vetter/Timmo/Petry (2008: 229) advance the view that from the perspective of market and competition orientation the bundling of related tasks in three business solution groups brought about a stronger orientation to the needs of the customer.

These changes at SAP can also be considered a case of teleologically induced change because in order to adapt organizational structure to corporate strategy, the corporate management implemented a consciously planned change process, i.e. change management. The implementation of the restructuring took place in a number of sequential project phases from August 2003 to March 2004. A project organization was set up especially to plan in detail the sequence of individual phases to implement the new organizational structure and accompany their execution. The strategic effectiveness and efficiency of the organizational solution were supervised during the eight-month realization phase by a special project manager.

5. Teleology and change

Teleological change in an economic context means goal- or purpose-directed change. It is driven by actors that are oriented toward "change teleology", that means the impulse of teleological change is a goal-oriented, decisive, proactive individual – the "homo teleologicus", who can be characterized according to the Roman philosopher Lucius Seneca adjudicated sentence as "to desire", "to be able", and "to dare"(Armin v. 1978: 278 and 510). Purposeful action can take place when an environment is not

completely deterministic and allows actors voluntaristic opportunities to intervene in their environment. In such an environment teleological action is characterized by the following elements:

- Because teleological action is principally based on analytical decision-making processes, reliable information about the perceived problem situation as well as possible solutions are necessary. In addition, actors must have sufficient knowledge to be able to adequately interpret the decision-making situation. In contrast to the methods of 17th and 18th century alchemists, who did not have sufficient knowledge of chemical processes and so pursued the unrealistic goal of turning non-precious metals into gold, teleological action is characterized by the availability or derivability of sufficient information about the problem structure. In the strategy example, the extensive evaluation of the current state as well as the forecasting of environmental developments is a precondition for using an Ansoff matrix to identify strategy. In the GROWIAN case study, pioneering work on the technical design of wind power plants had already been done and was subsequently used in goal formulation. SAP was able to make use of findings in organizational development research when reorganizing its organizational structure.
- In order to achieve formulated goals, relevant strategies can be studied and the best one selected. Obviously this can be done best when there is a well-structured decision-making environment. As already mentioned, this condition cannot be fulfilled completely in practice. However, action strategies can be identified that will achieve the defined goals at least in a satisfactory manner. This enables a differentiation between teleological methodology and "trial and error" method.
- Sufficient resources are necessary to implement the strategy. This includes the ability to develop detailed programs, short-term plans and budgets. In the case of GROWIAN, the project management had enough financial resources and also the power to have detailed performance objectives and time frames to implement the wind power plant and push through their implementation, although construction faults were already visible at this stage and important stakeholders had already ended their involvement in the project at that point in time.

Teleological action does not necessarily lead to far-reaching change. It can also help to stabilize existing processes and states. It still needs to be clarified under which circumstances impulses, originating in the goal-oriented behavior of actors, lead to profound change. In order to answer this question one can consult the findings of motivation research in cognitive psychology, which characterize the state of goal-oriented action with the parameters "direction", "intensity" and "duration" (Puca/Langens 2008: 224). All three aspects are of critical importance if a fundamental change is to occur. Regarding stabilizing or changing action, the *direction* of the motivation is decisively influenced by the conscious perception of a misfit. While perceiving minor divergences leads to adaptation measures and has a stabilizing effect, perceptions of serious divergences result in change actions and determine the setting of corresponding goals. Since far-reaching changes are about consciously leaving the well-trodden path and setting out on new ones, such action requires an especially strong *motivation* in order to overcome the difficulties such a change entails, including for example psychological

barriers (subjective fears of change) or distorting perception anomalies (loss aversion and endowment effects) (Kahneman/Tversky, 1979). With regard to duration the main focus is on the *stability* of the motivation. In situations of far-reaching change there will be difficulties in all phases of goal-oriented action, so that over the whole of the teleological action cycle (cf. Fig. 1) the strength of motivation must be maintained.

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