A Generic Model of Organizational Inertia, Attention, and Change

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Abstract

There exist many examples of organizations which failed to react to environmental change. Polaroid and Digital Equipment Corporation (DEC) are just two of them. While existing research in particular focuses on organizational inertia and routines as impediments to change, attention to stakeholders has not received much consideration outside the area of business ethics. Since attention proved an influencing factor at Polaroid, DEC, and in a change process of the New York Stock Exchange, the interrelationships between inertia, attention, and change will be analyzed in the present paper. Stakeholder attention proved to be influenced by stakeholder pressure as well as an influencing factor on the perception of stakeholder pressure. Additionally, sensitivity analyzes revealed how different policies for managerial intervention work by themselves as well as in interaction.

Key Words

Organizational Change, Inertia, Attention to Stakeholders, System Dynamics

A Motivation for a Generic View

Between 2006 and 2007, the New York Stock Exchange (NYSE) underwent a radical change and shifted from floor-based to mainly electronic trading. After it had resisted this move for years and even decades and after many people had predicted its resulting decline, it radically transformed its business strategy and re-focused on institutional customers who demanded electronic trading. Most of its competitors had made this move much earlier. The Cincinnati Stock Exchange, the Philadelphia Stock exchange, the Chicago Mercantile Exchange, and NASDAQ implemented electronic systems in the late 1970s or 1980s already (Geisst 2004, p. 506; Hamilton 1981, p. D6; National Stock Exchange (NSX) no date; Seligman 2003, p. 521; and Welles 1990, p. 74). The move towards electronic trading was an international phenomenon. In 1986, for example, the London Stock Exchange changed from open outcry to screen-based electronic trading (Clemons and Weber 1990, p. 42; and Michie 1999, p. 586–587). Although the New York Stock Exchange takes a special position among U.S. and even world-wide stock exchanges, its behavior is typical for even a class of organizations. Organizational 'dinosaurs' that are often long-established corporations but also younger organizations often have difficulties adapting to a changing environment. They exhibit inertia and often adapt late or not at all. The short recall of several known examples will demonstrate this similar pattern of behavior.

The computer manufacturer Digital Equipment Corporation (DEC) also failed to undergo necessary change in its strategy and culture. The innovation of the personal computer altered the organization's market environment. A new group of private customers emerged who had different preferences and who were served by DEC's new competitors. Since DEC's management did not perceive the needs of this customer group, it missed major market opportunities (Schein 2003, p. 291). The organizational culture remained focused on clients with a strong technological interest. The grown belief that technologically sophisticated computing products will prevail in the market was deeply embedded in DEC's culture and resulted in a reduced perception of the radically altered environment with new solutions and stakeholder groups (Schein 2003, pp. 74 and 201–203). The DEC example shows that apparently similar reasons led to the failure to change at DEC and the NYSE. A missing orientation to an important stakeholder, i. e. to a group in the focal organization's environment, has had a significant impact on the failure to change.

Attention to important customers also led to the demise of the camera and film manufacturer Polaroid. Although the company did invest in a new technology, it misjudged the rising importance of a new group of customers and their preference for digital photography. The failure to depart from its established business model was grounded in the management's cognitive representations. Adequate adaptation to the new environment would have required change in the strategic beliefs (Tripsas and Gavetti 2000, p. 1158).

The case of Nestlé was somewhat different from DEC and Polaroid. Customers accused the boycotted Nestlé for its unethical marketing practices in the developing world. The question did thus not center on the adoption of a new technology, but rather on a new strategy of ethical conduct and respective marketing. At the same time it is also an example of a long-term neglect of stakeholder preferences and of a strong orientation towards its taken for granted strategy (Post 1985, p. 123; Richter 2001, pp. 77–78; and Sethi 1994, p. 70). Finally Nestlé learned. When its practices were questioned in a different case later, it reacted much more quickly.

In the three cases described above, organizational inertia played a critical role. Inertia expresses the idea that organizations do not change as quickly or completely as some groups want them to change in order to be adequately adapted to the environment. In relation to managerial cognition and bounded rationality, it often resulted in the failure to attend to an important group of stakeholders. In this respect, the reactions of selected organizations to the personal computer,

digital photography, electronic trading, and to a rising demand of consumers for corporate ethical conduct are similar.

Previous research on organizational change and inertia often focused on institutionalization processes and organizational routines. A manifestation process of strong inertial forces within populations is supposed to prevent major changes (Hannan and Freeman 1984, p. 149). This evolutionary process abets organizations that are able to accumulate experience, reliability and continuity, making it unlikely for established organizations to be highly flexible. Organizational routines are understood as repetitive patterns of behavior, learned capabilities that have evolved over time (Cohen et al. 1996, p. 263; and Nelson and Winter 1982, p. 97).[1] Many authors regard routines as a major impediment to change. For example, redundant processes may exist which have been implemented to solve a problem that no longer exists. Although they served the organization well in the past, later they represent inappropriate deeply embedded knowledge and prevent a transition (Thun 2002, p. 71).

In the cases described above, the distribution of attention also seems to have played a significant role, but the stream of research on organizational inertia and routines has put limited focus on the distribution of attention. Attention to stakeholders rather receives consideration in the normative business ethics literature, but the representation of descriptive stakeholder theory in the organizational literature is very low (Mitchell, Agle, and Wood 1997, pp. 853 and 872–880).

The similarities between the different examples give reason into a further investigation of the causalities that generate behaviors at the NYSE and that were also apparent at Nestlé, DEC and Polaroid. These causal relationships and their informational value will be analyzed in the following chapter. This analysis is supposed to shed light into the question of why these organizations failed to react appropriately. Additionally it is supposed to give recommendations of what the leverage points are for an organization to remain adaptive to environmental demands.

The generic model that will be developed will portray the characteristics of a ‘canonical situation model’. According to Lane and Smart, this is a general model which applies to a specific domain (or class) of systems and is often derived from a more specific application case. Depending on the parameter and policy choices employed, it is able to generate significantly different modes of behavior. These types of generic models serve “as general theories of structure and behaviours of a domain” (Lane and Smart 1996, p. 102, also cf. p. 91). Forrester points out that in the best of cases a generalized model is constructed. It is a theory for a particular class of systems that can be adapted to specific circumstances by parameterization. The generalized structure explains phenomena and modes of behavior encountered in similar situations (Forrester 1968, p. 607). It this sheds light onto behavior and structural causalities and is able to explain generic characteristics of specific social phenomena. It represents a dynamic theory that is able to explain adaptive, inertial, and radical patterns of behavior observed in the real world.

There are many examples when system dynamics (SD) models were used to test, enlarge, or develop theories. E. g. Größler (2007, in particular p. 158) developed a concept model that linked competitive factors in production: i. e. time, cost, quality, and flexibility. Rudolph and Repenning (2002, p. 24) showed how interruptions in the organizational routines can lead to organizational collapse. Sastry (1997, p. 266; and 2001, p. 400) explicitly tested and enlarged Tushman and Romanelli’s punctuated equilibrium theory. Schwaninger and Grösser (2008, pp. 448, 457

[1] To some extent, the definition of routines used is consistent with Levitt and March as well as Cyert and March’s notion of standard operating procedures. Becker points out that the definition of routines as behavior contrasts the notion of routines as cognitive patterns or filtering rules, as Cyert and March call them. Cf. Becker 2004, p. 645; Cyert and March 1963, pp. 101–110; and Levitt and March 1988, p. 320.

and 461) also demonstrated the use of a case study as a means and locus of theory building in the area of product launch strategies. Based on SD modeling and a case study, they exemplified how to develop theory that is applicable to a whole class of systems. This places the generic system dynamics model or theory which will be developed here in the tradition of previous SD research.

B A Generic Model of Organizational Feedback and Change

B.I Generic Model Structure

The system dynamics model includes, first, pressure from stakeholders for the new strategy—called strategy B. Second, the pressure from the old stakeholders for the retention of the old system—here for strategy A—is considered but kept rather simple in order to be representative for many examples. The model and the analysis concentrates on, third, the managerial decision-making structure in order to adequately capture the reaction of organizational decision-makers to their environment.[2] The causal loops and the respective stock and flow structure will be described in the following order: Starting with the new developments in the market and stakeholder pressure for a new strategy—here for strategy B—resistance from stakeholders favoring the old strategy A will be added. Finally, the managerial mechanisms will be presented.

Two strategies—A and B—will be discussed. They may stand for mini vs. personal computers, for analog vs. digital photography, or for a pure cost strategy of a firm vs. a strategy that incorporates customer demands for ethical conduct. While the focal organization and the remaining market pursue the traditional strategy A, a strategy B is developed, e. g. by a competitor in the market. In the base scenario, the development is assumed to be no single invention, but to be a process that takes about 15 years to develop and on average 5 more years to be implemented in the market. The long development seems reasonable: The interest in ethical conduct started to increase in the 1980s and is still current in the year 2010. Digital photography started to develop in the 1980s, and became the dominant design around the year 2000. Yet, the structure also allows the testing of alternative developments.

The *development of B*, pictured on the left of Figure B-1, with the respective time delay of five years diffuses in the remaining market and increases the *fraction of stakeholders favoring B*. The latter fraction, when multiplied by the total number of stakeholders, results in the *number of stakeholders favoring B*, shown in the upper part of the figure.

[2] In the management sector the model bears high similarity with a case specific model that was developed to shed light into the specific case of the New York Stock Exchange. For an elaborate description of that model cf. Milling and Zimmermann 2010 forthcoming.

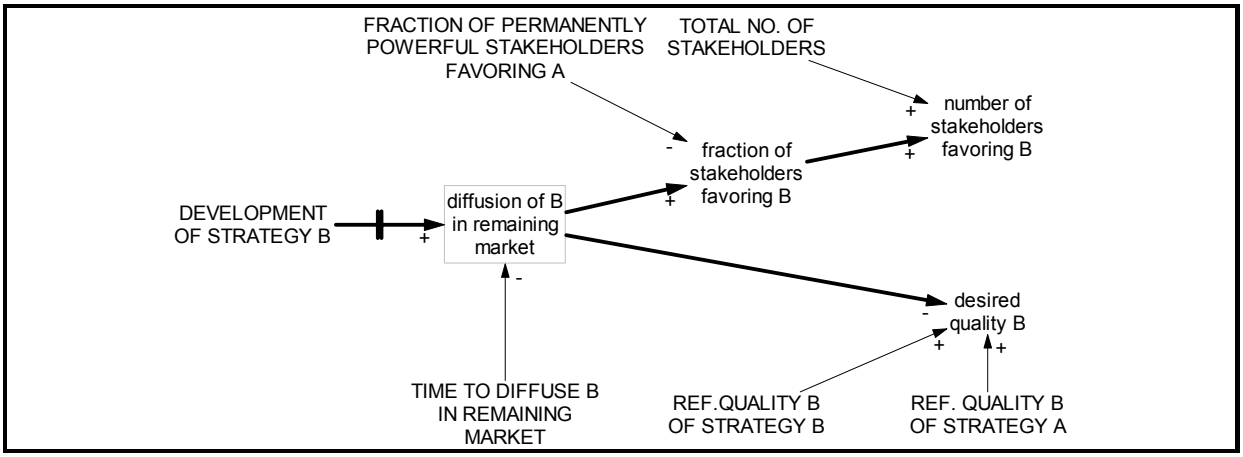


Figure B-1: Diffusion of B (SFD)

Many stakeholders prefer B because it succeeds at discovering the potential that is unused by the old strategy A. Strategy B offers a special quality B such as speed in the case of stock trading. The concept of the diffusion of a new strategy that entails an idiosyncratic quality complies not only with the emergence of electronic trading and the growing emphasis on speed vs. price among institutional customers. It also extends to the increasing preference for digital storage in photography, and the convenience of home computing as well as the availability of mobile telephony also serve as examples of the rising *quality B* of a new product or strategy. Apart from the invention of new technological applications the mechanism also extends to developments that require a new strategy that involves a rethinking among the management team or a change of the corporate culture. In the case of ethical conduct, for example, the *development of B* may not be the invention of a new technological application, but rather an increasing interest in ethical conduct, resulting in a group of stakeholders demanding ethical behavior from organizations.[3] Quality B could in this case be interpreted as a product's ethical quality. The concept described in the generic model extends to non-technological changes in the market to include significant shifts in customer or stakeholder demands that impinge on an organization. The focus is on transformations that require radical change and re-thinking in organizations.

On the bottom right of Figure B-1, the *desired quality B* forms from the *diffusion of B in the remaining market* that works as a weight for the *reference quality B of strategy A* and B respectively. The *quality B of strategy B* is set to 1 whereas that of strategy A is a rather small number. The computation of the *desired quality B* is broken down in the following equation B-1:

desired quality B [*quality unit*]=
diffusion of B in remaining market [*dmnl*]
• REF. QUALITY B OF STRATEGY B [*quality unit*] **B-1**
+ (1 – diffusion of B in remaining market [*dmnl*])
• REF. QUALITY B OF STRATEGY A [*quality unit*]

Those stakeholders favoring strategy B compare the developments of this new strategy and its quality dimension to the focal organization's orientation, as described in Figure B-2. In this respect, the focal organization's *quality B*, that derives from its *orientation to strategy B* rather than *to strategy A*, is compared to the *desired quality B* in the market. The resulting *relative quality B* is a measure for the adequacy of strategy that those stakeholders favoring B perceive. The *per-*

[3] For more information on the rising demand of ethical conduct cf. Miczka et al. 2009, pp. 91–92. For an opposite view cf. Carrigan and Attalla 2001, pp. 569–573.

ceived inadequacy of strategy per stakeholder B linearly grows to the value one while *relative quality B* falls to minus one. Each stakeholder that perceives an inadequacy exerts *stakeholder pressure for more B* that adds up to *total stakeholder pressure for more B*. The individual *reference pressure per stakeholder favoring B* is set to 0.6 in order to allow for upwards and downwards movement. In more general terms the pressure may also be interpreted as a stakeholder desire that the focal organization perceives or not. The weighting of this total pressure with the organization's *attention to stakeholders favoring B* gives the *perceived pressure for more B* which then leads to the focal organization's *change in strategy* towards more *orientation to strategy B*. In the area of stakeholder theory, for example, it is established knowledge that stakeholder pressure motivates organizations to implement new practices (Eesley and Lenox 2006, pp. 775–777; and Sarkis, Gonzalez-Torre, and Adenso-Diaz 2010, p. 164).

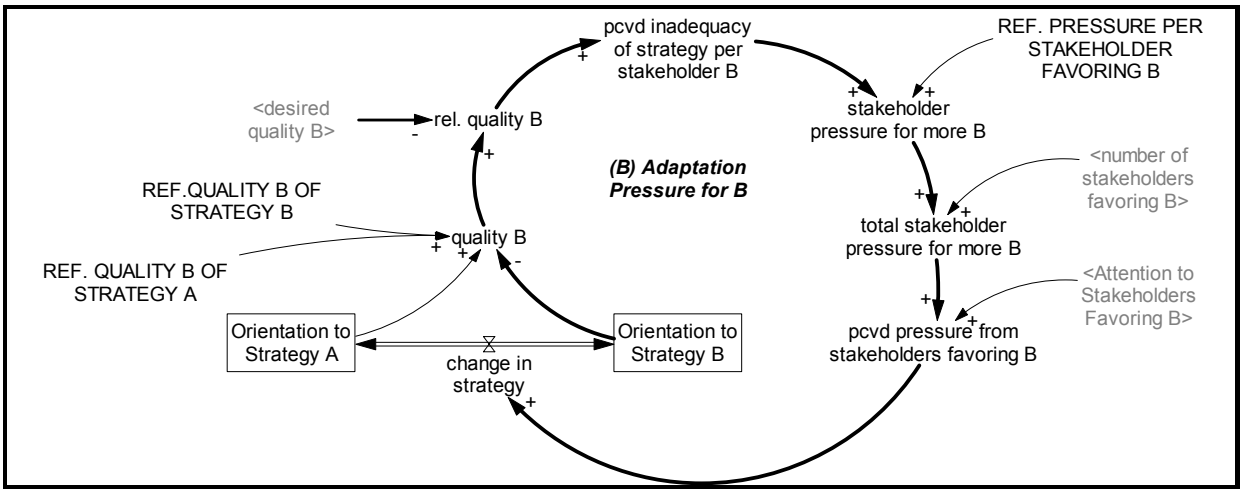


Figure B-2: Adaptation pressure for strategy B (SFD)

The causal relationships described above close the balancing feedback loop *Adaptation Pressure for B* that is also shown in a simplified causal loop in Figure B-3.

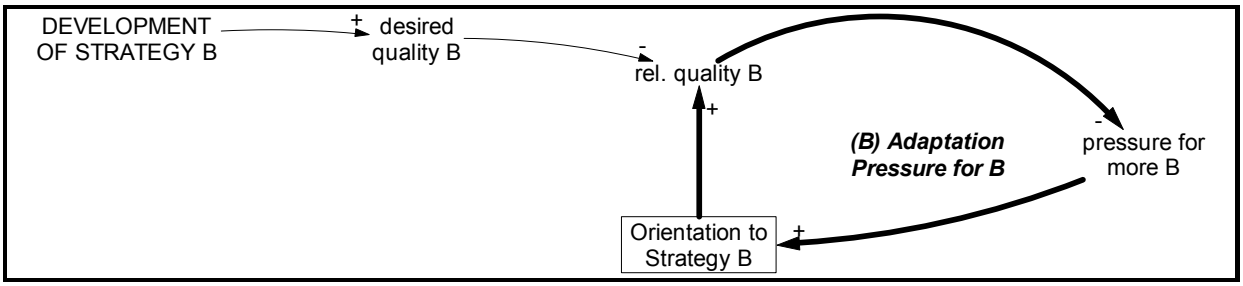


Figure B-3: Adaptation pressure for strategy B (CLD)

It can be expected that resistance from stakeholders favoring the old strategy follows the implementation of the new strategy B (Oreg 2006, p. 79; and Beer 1980, p. 103). The respective stock and flow structure is depicted in Figure B-5. The orientation to strategy A involves a specific quality, such as market quality of stock exchanges, resolution quality in analog photography, or the computation capacity of mini computers. This results in an absolute quality A that the focal organization offers. Quality A is presented as an absolute quality since the difference to the past quality, not to that of competitors is essential for the rise of resistance pressure. The *perceived adequacy of quality A* results from this comparison of the actual quality value with the floating goal of *desired quality A by stakeholders favoring A*. *Stakeholder resistance pressure for more A* rises when adequacy falls below its normal level of one, as Figure B-4 exhibits in more detail.

The *effect of quality on resistance* is slightly inversely s-shaped to account for a convergence on a maximum value of one and a lower rise of resistance when adequacy is close to one.

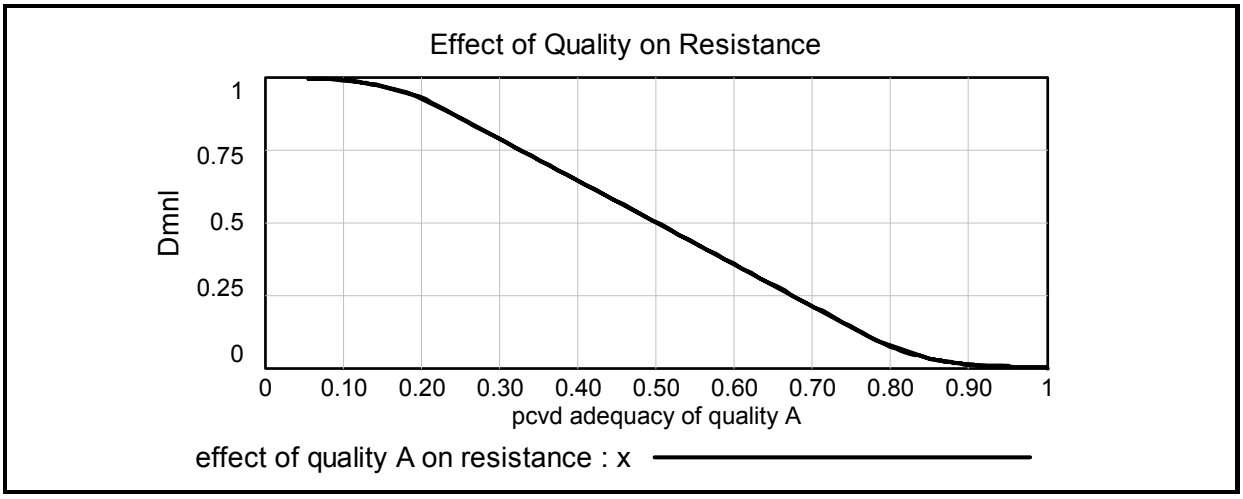


Figure B-4: Effect of adequacy of quality A on resistance pressure

The resulting resistance pressure depends on power of the stakeholders favoring A. It is expressed by their group size, e. g. by the number of customers desiring the old product. Additionally there may exist permanently powerful stakeholders whose power is independent of their group size and thus constant over time. In the base scenario their number is kept at zero, but it can be varied in order to represent changes such as that of the NYSE more closely. Individual stakeholder resistance multiplied with the sum of the *number of stakeholders favoring A* and the *permanently powerful stakeholders favoring A* results in the total *stakeholder pressure for more A*. The total stakeholder pressure for more A is thus computed as follows:

total stakeholder pressure for more A [*pressure unit*] =
stakeholder resistance pressure for more A [*pressure unit*]
• (no of stakeholders favoring A [*entity*] **B-2**
+ PERMANENTLY POWERFUL STAKEHOLDERS FAVORING A
[*entity*])

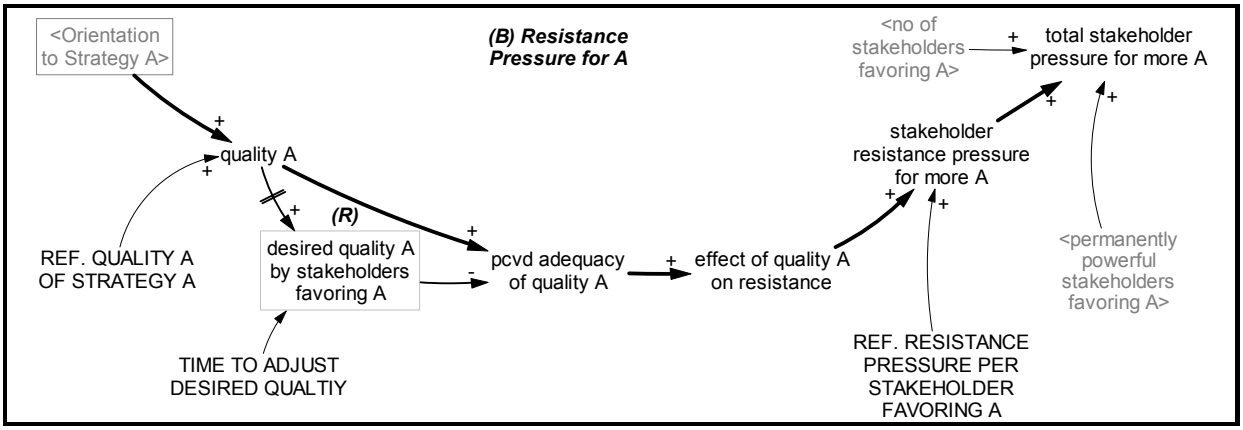


Figure B-5: Generic resistance pressure for strategy A (SFD)

Since the *total stakeholder pressure for more A* feeds back to the management's decision-making, the balancing feedback mechanism *Resistance Pressure for A* is closed. How this loop

fits in with the structure described before is additionally shown in Figure B-6. It represents the direct antipode to the adaptation loop, but only gets triggered once adaptation has started.

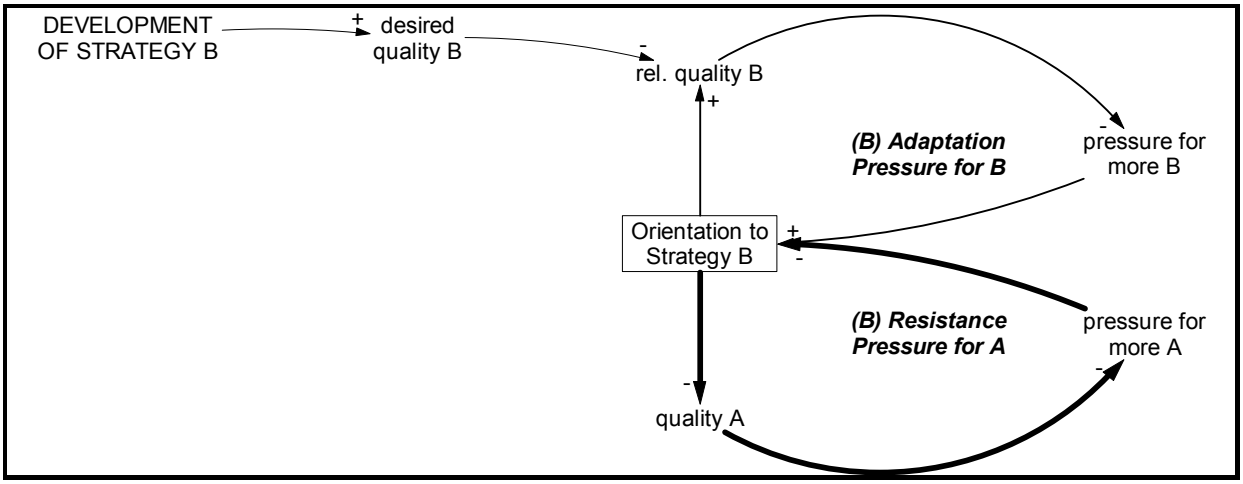


Figure B-6: Generic resistance pressure for strategy A (CLD)

The management team's decision-making is represented with a repetitive momentum and a repetitive attention mechanism. The *Repetitive Momentum Loop*, shown on the right part of Figure B-7, influences the change rate by which the focal organization shifts its orientation between strategy A and strategy B. The rate of *change in strategy* reduces *inertia* which—together with the *confidence effect of performance*— determines the organization's actual *openness to change*. This openness then affects the yearly *fractional change per perceived pressure* and feeds back to the rate of *change in strategy*.[4]

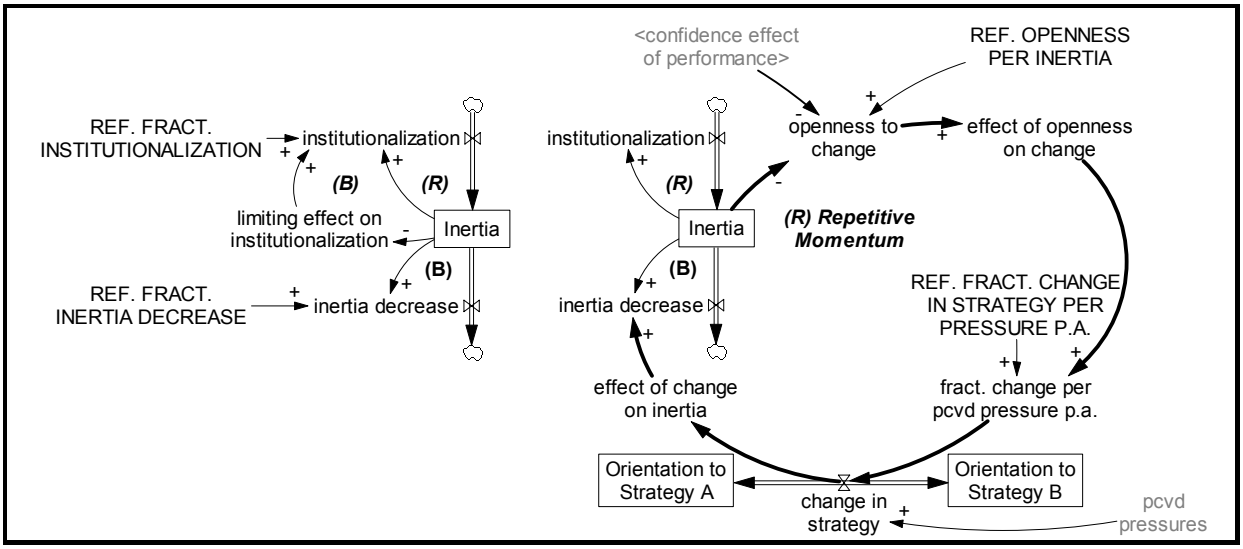


Figure B-7: Inertia and repetitive momentum (SFD)

As depicted in the left part of Figure B-7, inertia itself grows by institutionalization, in congruence with writings of the organizational evolution and organizational ecology literature. Researchers stated and also found evidence that—as time passes—institutionalization processes

[4] A technically somewhat different, but conceptually similar mechanism can be found in Larsen and Lomi 1999, pp. 412 and 419–420; and Sastry 1997, pp. 244 and 270–272. Sterman and Wittenberg also show that reinforcing feedback loops produce path-dependent behavior and lock-in. Cf. Sterman and Wittenberg 1999, pp. 332–333.

contribute to inertia. During times in which changes are not required, inertia and persistence consolidate (Hannan and Freeman 1984, pp. 152–155; Péli 2009, pp. 344–345. For empirical evidence cf. Audia, Locke, and Smith 2000, p. 849; and Starbuck and Milliken 1988, pp. 323–324, 329 and 331). Mollona (2002, p. 111) pointed out the distinction of resource-like inertia and cognitive inertia by two different accumulations (For the distinction of resource and routine rigidity also cf. Gilbert 2005, p. 742). In the present stock and flow diagram, the accumulation of the orientation to strategy A or B shows similarity to the concept of resource-like inertia since the stocks are inert and inflexible in the way that they comprise the accumulation of their history. The variable *inertia* itself, which particularly symbolizes the institutionalized routines and inflexibility in the thinking of the focal organization's management, has similarity to the concept of cognitive inertia.

Inertia decreases by the replacement of old with new employees who bring new ideas to the organization as well as by the learning of new and unlearning of old patterns of thinking and behavior. This unlearning increases when change takes place (Nadler and Tushman 1995, p. 23; and Wollin 1999, p. 362). The s-shaped relationship between a change in strategy and its effect on the decrease of inertia is shown in Figure B-8. Its shape symbolizes a less than proportional disruption of routines and thinking when changes are incremental.

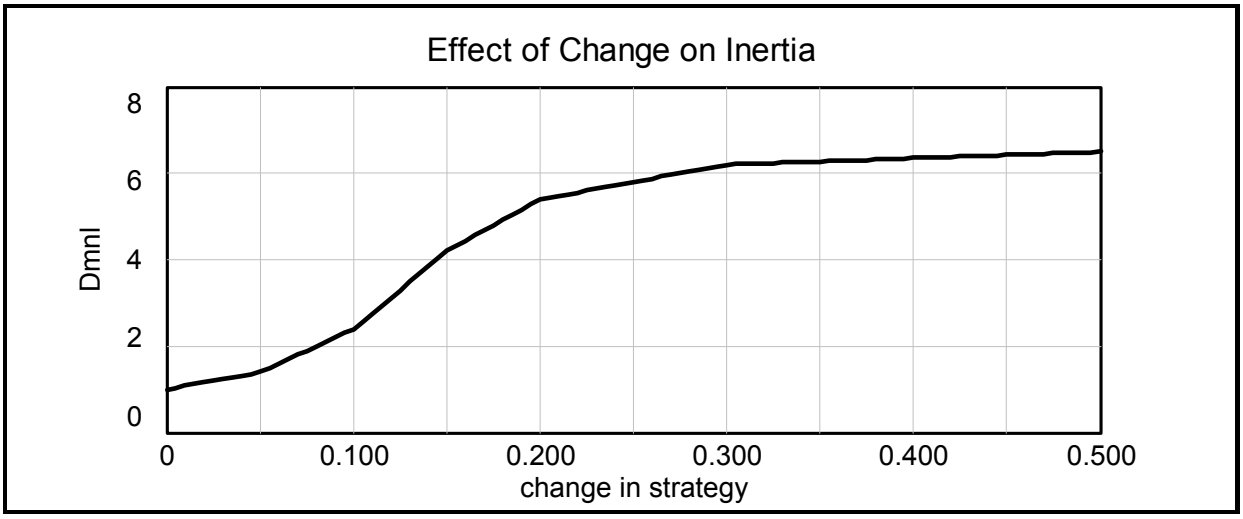


Figure B-8: Effect of change on the decrease of inertia

The rate of change in strategy not only affects inertia, but is itself affected mainly by perceived pressure from stakeholders for more A (or B), illustrated in Figure B-9. Depending on which pressure is greater, the organization shifts to strategy A (or B). Additionally and only in the case that the orientation to A or to B is already very high, a limiting effect influences the rate of change so that it looks as follows:

change in strategy *[dmnl / year]* =
(pcvd pressure from stakeholders favoring B *[pressure unit]*
• effect of B on change *[dmnl]*
- pcvd pressure from stakeholders favoring A B *[pressure unit*
• effect of A on change *[dmnl]*)
• fract. change per pcvd pressure p.a. *[dmnl / pressure unit / year]*

B-3

The limiting effects work when stakeholders still exert pressure for a strategy that is already almost fully implemented. The management team becomes hesitant in reacting to the full pressure.

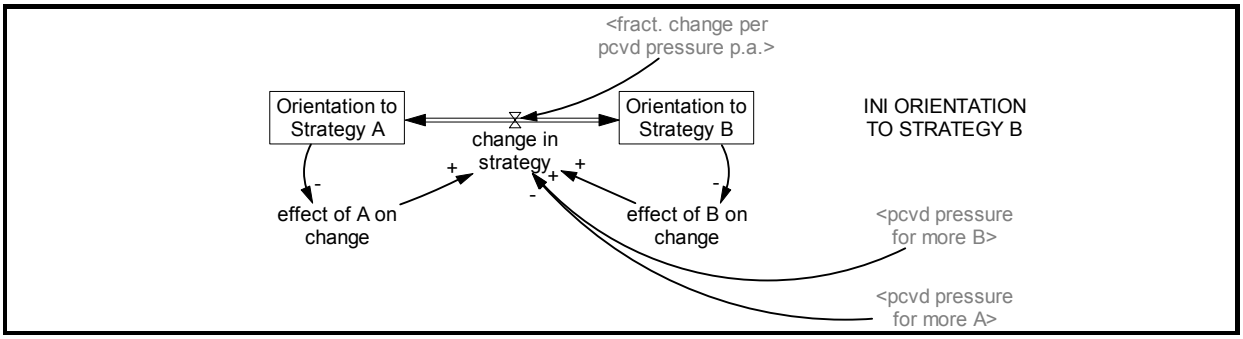


Figure B-9: Limitations to changes of strategy (SFD)

Phenomena such as the concentration on floor firms do not represent an unparalleled example. DEC, for instance, was a highly client-oriented organization. The company even maintained the Digital Equipment Corporation Users Society in order to provide for the possibility of mutual exchange, feedback, and learning. At the same time, exactly this strong relationship to loyal customers made the DEC management inattentive to the growth of a new group of customers that favored the PC. DEC appeared to be customer oriented, but concentrated on one customer group only (Schein 2003, pp. 74 and 252). At DEC the culture remained focused on clients with a strong technological interest. The organization's cultural inertia was responsible for the lack of attention to an altered environment with different stakeholders. Magness (2008, p. 177) supports in an empirical analysis that "stakeholder status is impermanent, and determined through the eyes of the decision-maker." Therefore, it is also necessary to include the concept of attention to stakeholders into the generic model of organizational inertia and change.

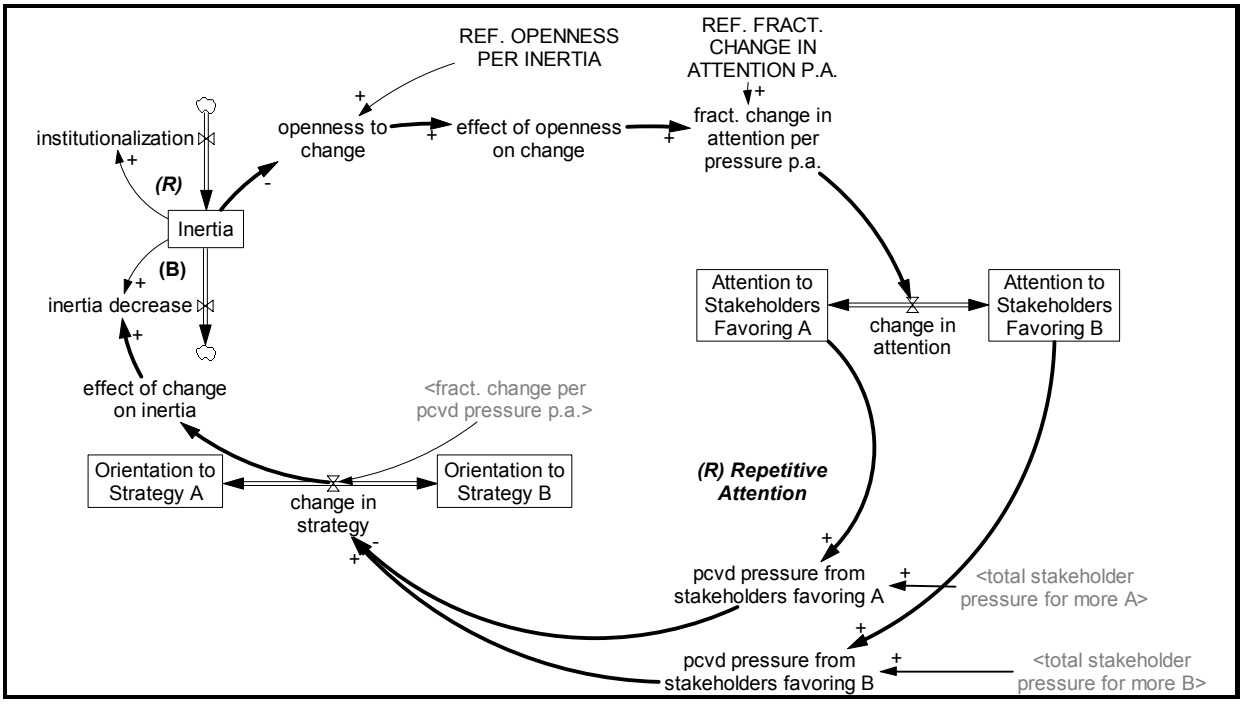


Figure B-10: Attention to stakeholders (SFD)

Via the openness to change, inertia also affects the attention to stakeholders. Figure B-10 reveals that openness increases the annual *fractional change in attention per pressure* and thus allows for a faster reaction of attention to pressure from stakeholders. How the adaptation to pressure takes place is further detailed in Figure B-12 and will be described in the next paragraph. Back to Figure B-10, a modified accumulated *attention to stakeholders* also affects the weighting of pressure and results in an altered *perceived pressure from stakeholder favoring A* (or *B*) for more A (or B). Since the perceived pressure feeds back to the *change in strategy* and to *inertia*, the reinforcing *Repetitive Attention Loop* is closed. The weighting relationship of attention has generic value because e. g. González-Benito and González-Benito (2006, p. 1368) found a similar relationship not for stakeholder attention, but managerial environmental awareness. The latter increases the perceived pressure for environmental issues and the implementation of environmental practices. This *Repetitive Attention Mechanism* as well as the *Repetitive Momentum Loop* shown in Figure B-11 exhibit reinforcing behavior.

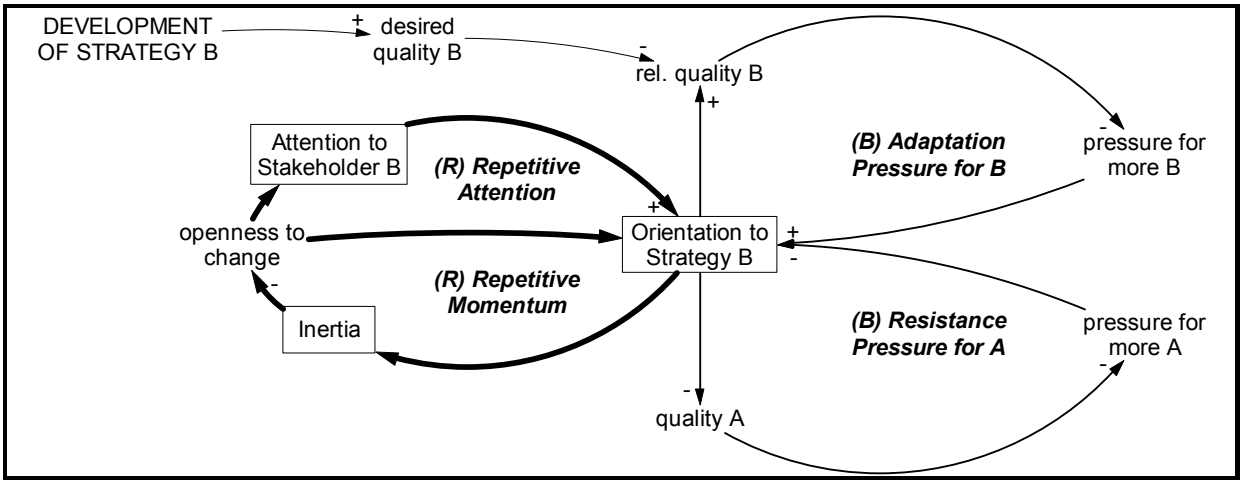


Figure B-11: Repetitive momentum in the generic model (CLD)

While in particular the freeze of attention is a result of high inertia and thus a low *fractional change in attention per perceived pressure*, attention also shows adaptive behavior. The adaptive mechanism is displayed in Figure B-12. The *change in attention* is positive and *attention to stakeholders favoring B* rises when the perceived *pressure from stakeholders favoring B* is higher than that from stakeholders favoring A. The balancing effect of attention to B (A) limits a further orientation to stakeholders favoring B (A) when the attention to these stakeholders is already very high. While certain stakeholders may continue to exert pressure, the management team would not be willing any more to fully react to these forces and further change its attention. The rate of *change in attention* is thus computed as follows:

change in attention [*dmnl / year*] =
(pcvd pressure from stakeholders favoring A [*pressure unit*]
• effect of attention to A on change [*dmnl*]
– pcvd pressure from stakeholders favoring B [*pressure unit*]
• effect of attention to B on change [*dmnl*])
• fract. change in attention per pressure p.a. [*dmnl / pressure unit / year*] **B-4**

As Figure B-12 explains structurally, the perception of pressure from stakeholders itself is biased by the current distribution of attention, leading to the following computation of the perceived pressure, here exemplified for the *perceived pressure from stakeholders favoring B*.

pcvd pressure from stakeholders favoring B [*pressure unit*] =
total stakeholder pressure for more B [*pressure unit*] **B-5**
• Attention to Stakeholders Favoring B [*dmnl*]

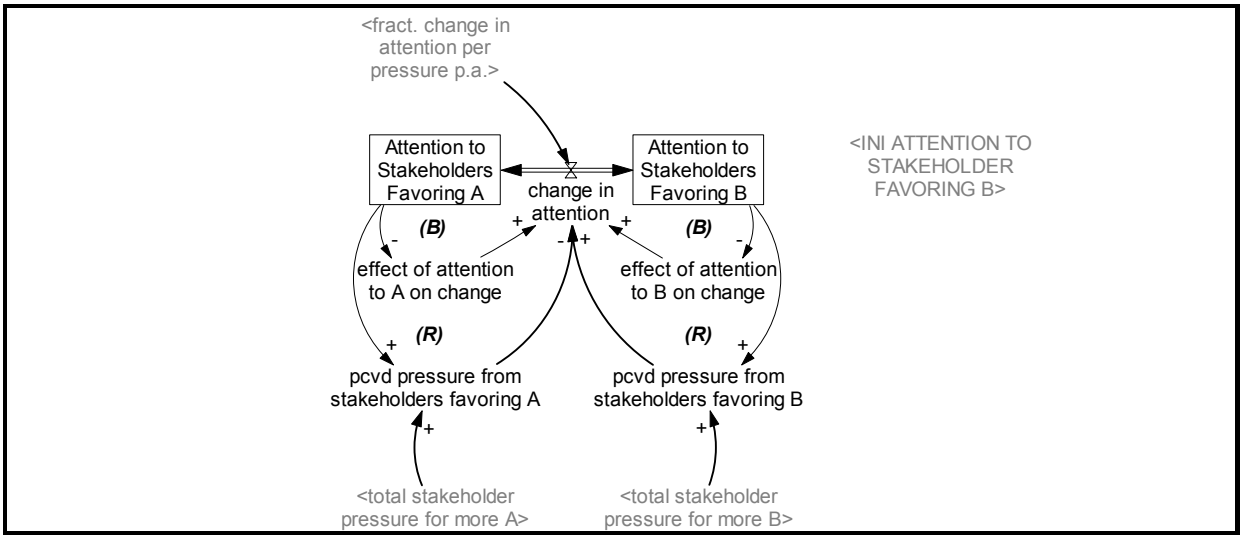


Figure B-12: Limitations to changes in attention (SFD)

Since attention serves as a weighting factor for the incoming forces from stakeholder pressure, this creates two reinforcing mechanisms that bias the perception of forces towards those stakeholders the management team listens to. Nevertheless, while attention may be biased, in generally it also adapts to existing *total stakeholder pressure for more A* or *B*. Once those who demand change receive more attention, this triggers change. Then the interests of the stakeholder demanding change are better met so that they do not need to exert this much pressure any more. These feedback mechanisms of the adaptation of attention are detailed in the causal loops of Figure B-13.

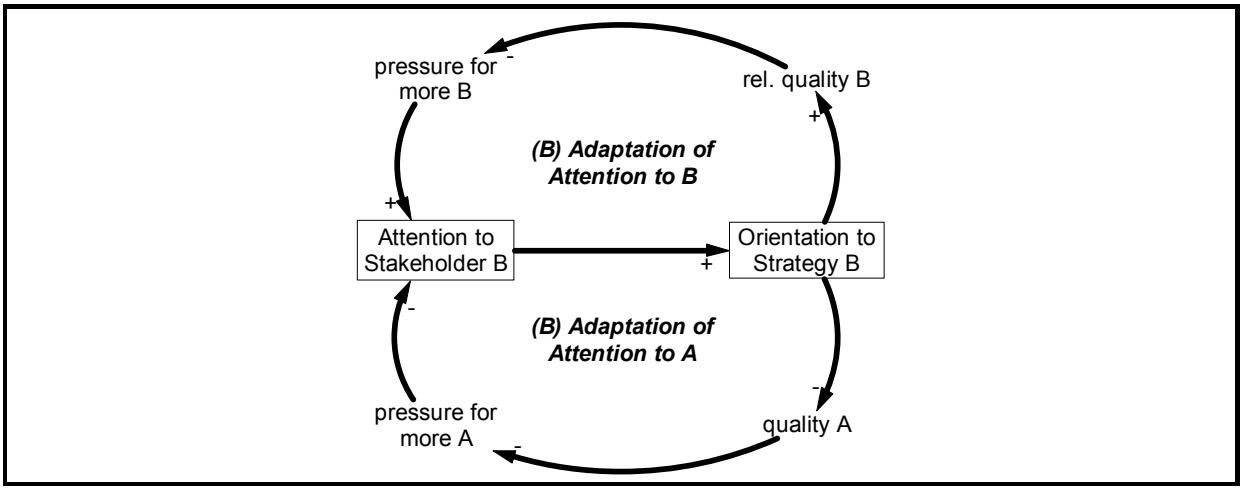


Figure B-13: Adaptation of Attention (CLD)

A further important feedback relationship can be found between the managerial decision-making and performance. In different organizations performance may represent varying concepts such as market share as well as the sales level or the size of the customer base. Therefore, its representation is kept general and plain to match all of these interpretations. The idea that different effects adjust performance upwards and downwards are also known from works by Salge (2009, p. 51; and Sterman 2000, p. 393) and Sterman (2000, p. 393), for example, in which cases market share is affected by effects of quality and attractiveness.

Figure B-14 indicates that *quality A* and the *relative quality B* that come with the pursuit of strategy A or B both adjust performance. Which of these effects prevails depends on the weight that customers attribute to the qualities, e. g. the weight on speed vs. price or on digital editing vs. resolution quality in photography. The *weight on quality B vs. quality A* directly emanates from on the distribution of stakeholder preferences (i. e. the *fraction of stakeholders favoring B*). This *performance adjustment* amends the *reference performance*, set here to 0.5 performance units that represent e. g. market share or the size of the customer base. Since information about an organization's offerings needs to diffuse in the market and customers may show some loyalty, *performance* adapts to its indicated value with a time delay of one year.

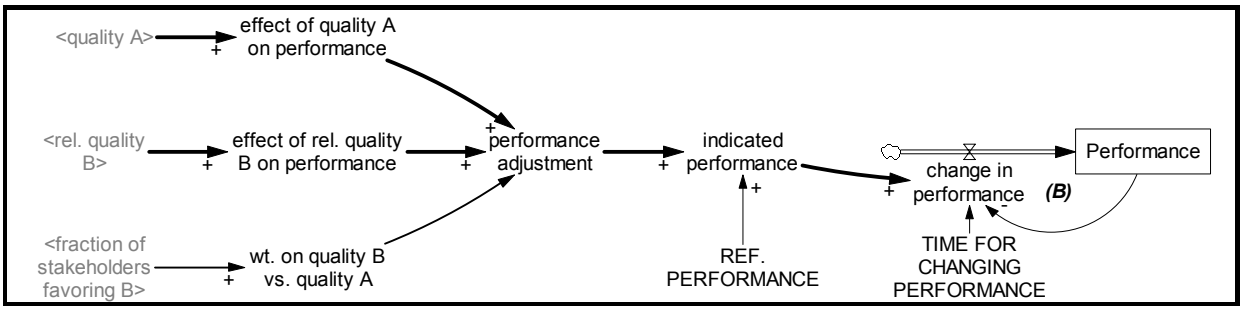


Figure B-14: Performance (SFD)

At the NYSE, for example, the descent of market share helped the introduction of a new electronic trading strategy (Storkenmaier and Riordan 2009, p. 11). In a more general sense, this idea conforms to the concept of aspiration levels and failure-induced change of the behavioral theory of organizations. If performance falls below the aspiration level, the organization is more likely to search for a solution and undergo change (Cyert and March 1963, p. 121; and March and Simon 1958, p. 173–174 and 184). Figure B-15 reveals the detailed causal diagram of this process. If *performance* if below the aspiration level of *desired performance*, it is perceived as inadequate and confidence in the current strategy is lost. This *confidence effect of performance* is weak for minor inadequacies as they may reflect normal variations of performance not related to the organization's strategy. For greater perceived shortcomings the effect quickly aggravates and increases the organization's *openness to change*. These causal relationships also comply with the view of Lant and Mezias (1992, p. 48) who maintain that the impetus for change and for the adaptation to the environment is triggered by a performance gap between current and desired performance. They also found empirical evidence that historical performance provides the most robust description of aspiration levels (Lant 1992, pp. 641–642).

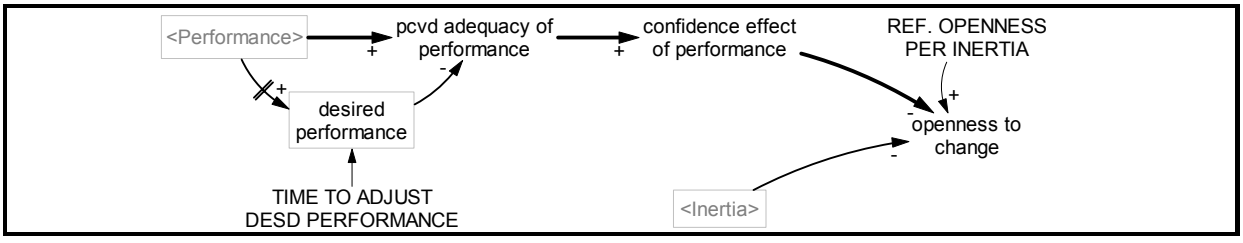


Figure B-15: Relationship between performance and change (SFD)

In the view of Forrester and Senge (1980, p. 221), a model of the loss and gain of market share should include the effect of different policies followed by contrasting companies on market share. This has been achieved by the linking of qualities A and B to *performance* and further linking the latter to the *openness to change*. The full resulting feedback cycles involving performance and the orientation to a strategy are shown by bold black lines in Figure B-16. Low performance in-

creases the openness to change and—in the case of a pressure imbalance in favor of strategy B—the organization reorients towards strategy B, increases its relative quality B, and performance increases in an adaptive manner. This balancing mechanism is called *Performance Adaptation*. It has a reinforcing side effect since the reorientation further reduces quality A and diminishes performance. This *Performance Decline Loop* allows the organization to reorient to the alternative direction even more quickly.

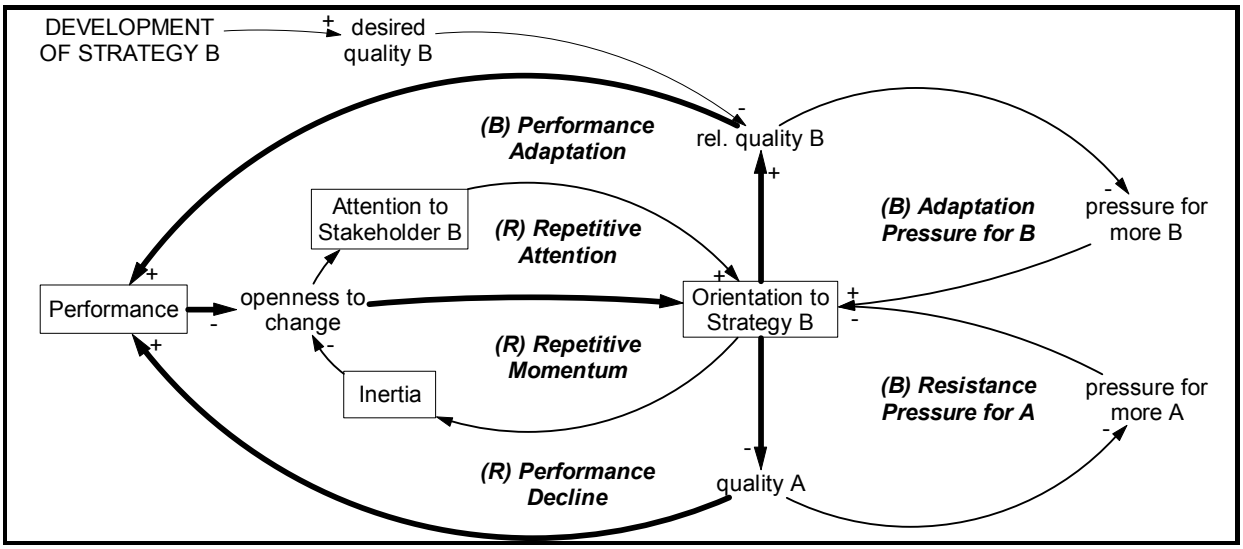


Figure B-16: Performance (CLD)

The structure of the generic system dynamics model has now fully been specified. It includes the environment as an external driver of change. Endogenously it incorporates stakeholders in the close environment of the focal organization and managerial decision-making as it relates to cognitive elements. The model's explanatory power will be analyzed in the next chapters.

B.II Validation of the Generic Model

Validation of a generic structure is more difficult than gaining confidence in a model that maps a specific example. Nevertheless it is possible (Größler 2007, p. 152; Lane 1998, p. 942; and Lane and Smart 1996, p. 113). In particular as regards to generic system dynamics models it is useful to distinguish two different kinds of validation: internal and external, both of which will be addressed. Internal validity exists if the model is consistent and sound (Größler 2007, p. 146). It can be tested just as in a case-specific model. This has initially been done by tests of model structure that will be described.

Very fundamentally, the generic model is dimensionally consistent (Forrester and Senge 1980, pp. 215–216; and Größler 2008, p. 262). Additionally, it is only possible to have confidence in the structure since the behavior it produces is insensitive to changes in the choice of integration frequency (time step) and method (Sterman 2000, p. 872). Many aspects of structural validity were already described together with the model structure. For example, it was laid out how model variables and in particular parameters correspond to reality. E. g., the *reference fractional inertia decrease* was compared to employee turnover, and the *reference change in attention* might represent the intensiveness of the search for new trends and stakeholder groups, e. g. by means of consultation of market search institutions. Parameters in this case cannot be compared to exact data. Since the model includes many soft variables and parameters, an exact quantification is not possible and it is not necessary. The degree of accuracy is always judged against model purpose (Richardson and Pugh III 1981, p. 230). Forrester (1961, p. 171) mentions that for many purposes

it is sufficient to estimate parameters within the plausible range because it will not affect results significantly. For this reason, different numerical parameters values are rather understood as qualitative values such as low, rather low, medium, or high levels of e. g. reference fractional changes in inertia or attention.

Extreme conditions tests were useful to validate the causal structure because they uncover whether the model produces results that are inconsistent with e. g. physical laws. In this way, they are a means to uncover inconsistencies in assumptions made. The sensitivity analysis includes a broad number of extreme and simultaneous parameter changes also produces sensible outcomes. It results in orientations to strategy B ranging between 25 and 100 percent, high variation in inertia and attention, and rather high sensitivity in performance—all of them within reasonable bounds.

According to Lane (1998, p. 942) as well as Milling (1974, p. 212), the aim is to have a homomorphous mapping of encountered phenomena. The quality of this mapping can be analyzed in particular with the family member test suggested by Forrester and Senge. This test is part of the behavioral validation of a generic model. It checks the applicability of the generic model to a class of phenomena, and it tests whether a modification of parameter values is able to generate behavior appropriate for different organizations within a class (Forrester and Senge 1980, p. 220; Lane 1998, p. 942; and Lane and Smart 1996, p. 110). The validation procedure helps to clarify whether different modes of behavior known to occur in the class of systems that the generic model stands for can be reproduced. In this way, it also establishes external validity of the model.

In close relation to the family member test, behavioral correspondence can be investigated by the behavioral anomalies and the surprise behavior test (Lane 1998, p. 942). Behavioral anomalies and surprise behavior can be used on a continuous basis in the modeling process to detect flaws in the model's assumptions. Tracing back the reasons for the behavior has helped decide whether the anomalies required a modification of assumptions or conveyed surprise behavior that helps advance the understanding of the system (Forrester and Senge 1980, pp. 220–221). System understanding is also enhanced by the testing of different policies and the sensitivity of recommendations to parameter changes. This way it becomes evident which policies lead to a system improvement. Additionally the further analysis of policy sensitivity provides information on the robustness of strategy and policy recommendations (Richardson and Pugh III 1981, pp. 349–352).

The generic model structure includes elements of the environment, inertia, cognition as well as stakeholder reactions. With the structure laid out, the next step will be the investigation into the generic model's behavior. For this behavioral analysis a simulation period of 50 years was chosen. While this time horizon may seem long at first glance, it roughly equals two to three times the implementation time of important innovations and of customer demand changes. The rising demand for organic produce as well as for digital cameras constitutes an example.

C Analysis of Structure and Behavior

C.I Effects of Reinforcing and Balancing Feedback on the Occurrence of Change

In the base run scenario, the generic model exhibits a radically changing behavior. While a smooth s-shaped adaptation takes place in the remaining market, expressed by the grey line 1 in Figure C-1, the target organization (line 2) initially does not react, but then shows a much steeper s-shaped growth than the remaining market.

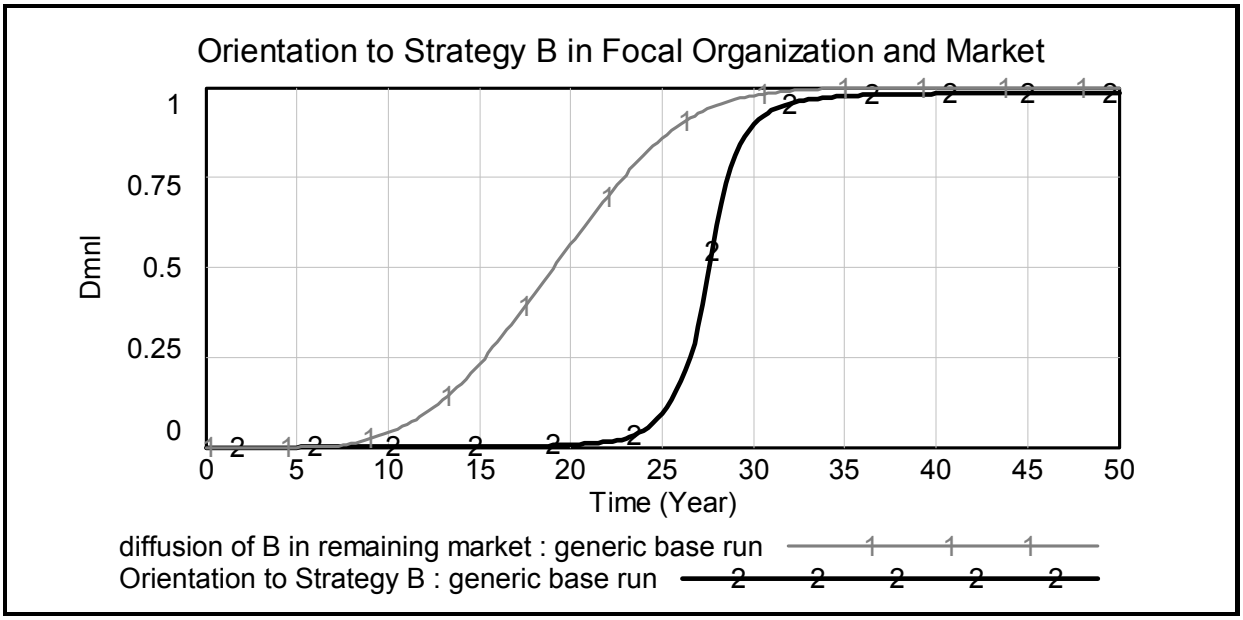
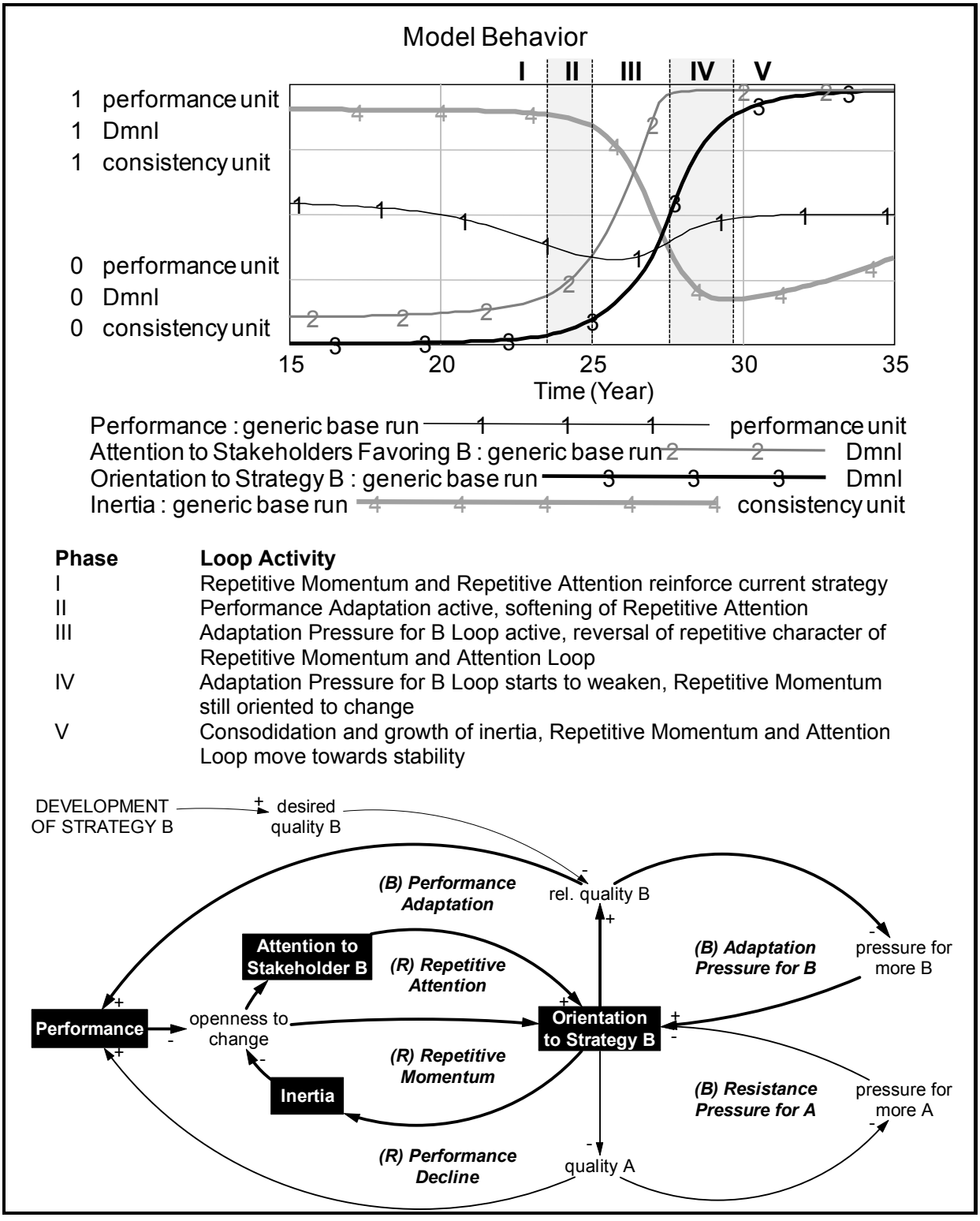


Figure C-1: Generic base run (BOT)

The observed behavior can be explained by relating the behavior of selected variables shown in Figure C-2 to the full causal structure. The upper part shows an excerpt of model behavior in period 15 to 35, broken down into different phases during which loop activity differs. The four variables presented in the BOT graph are also highlighted in a CLD further below in the figure.

In phase I, hardly any change in the strategy takes place (line 3). The *Repetitive Momentum* and *Repetitive Attention Loop* reinforce the current orientation to strategy A. As a consequence pressure for change is not fully perceived and those perceived are just marginally implemented. When performance declines (line 1) the organization becomes somewhat more open to change and enters into phase II, initiated by the balancing *Performance Adaptation* mechanism. Attention adapts more quickly than the organizational strategy, and this small performance effect additionally helps the organization to become more attentive to the stakeholders who exert pressure, and stakeholder attention slowly starts to shift towards those favoring strategy A. The *Repetitive Attention Loop* begins to soften. The stakeholders favoring B attract more and more of the management's attention and attention adapts to their pressure. This change in stakeholder attention is sufficient for the change towards strategy B to take off (line 3) in phase III, triggered by the balancing effect Adaptation *Pressure for B*. Change reduces inertia (line 4), and enables the *Repetitive Momentum Loop* (and *Repetitive Attention Loop*) to turn its repetitive character towards the direction of more change. In phase IV, the repetitive momentum still allows for alteration, but the balancing forces of the loop *Adaptation Pressure for B* start to become weaker as the organization orients more and more towards strategy B. In phase V, adaptation has basically been completed and consolidation becomes important again. Institutionalization processes increase inertia, and the *Repetitive Momentum* and *Attention Loop* shift again towards stability and rigidity.



Phase	Loop Activity
I	Repetitive Momentum and Repetitive Attention reinforce current strategy
II	Performance Adaptation active, softening of Repetitive Attention
III	Adaptation Pressure for B Loop active, reversal of repetitive character of Repetitive Momentum and Attention Loop
IV	Adaptation Pressure for B Loop starts to weaken, Repetitive Momentum still oriented to change
V	Consodidation and growth of inertia, Repetitive Momentum and Attention Loop move towards stability

Figure C-2: Phases of loop dominance (BOT and CLD)

Since—at least in the generic base run—in the end all stakeholders favor strategy B, the balancing *Resistance Pressure* and the reinforcing *Performance Decline* mechanisms are of minor importance. When the organization finally reacts, stakeholder preferences have almost completely shifted to strategy B so that there is only minor resistance from the few favoring B.

C.II Consecutive Environmental Transformations

The importance of the relation between pressure to adapt, attention, and the focal organization's ability to change also becomes obvious when two environmental changes are simulated. Figure C-4 displays a modified version of the base run scenario. It overlaps the base run until period 30, but then a second shift takes place, triggered by stakeholders favoring strategy B, to which the remaining market adapts with an average time delay of five years (line 1). For reasons of modeling feasibility, this was modeled as a move back to strategy A instead of a shift towards strategy C. The stakeholders originally favoring B now pressure for the diminution of strategy B (meaning for less B). Technically, this is represented by the lookup effect revealed in Figure C-3 by which not only an underachievement in the *relative quality B* (below 0) leads to a perceived inadequacy, but also an overachievement gets sanctioned. Stakeholders favoring B now not only exert pressure for more B, but also for less B when the focal organization' relative quality B reaches values above market average. Since the market transformation takes both directions, it needs to be assumed that both over- and underachievement in quality B lead to some kind of pressure for change.

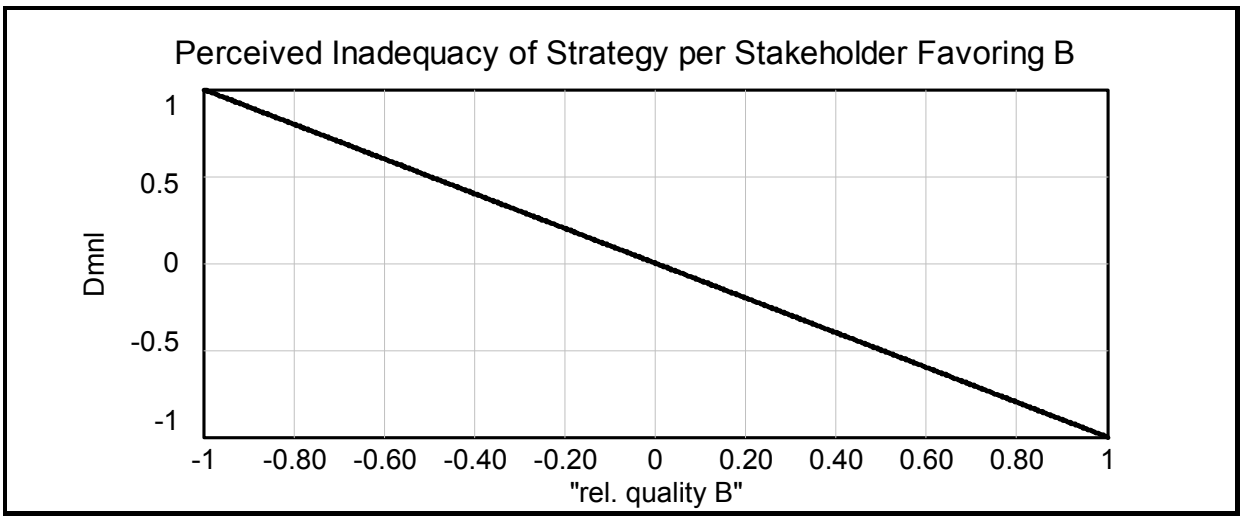


Figure C-3: Relationship between relative quality B and strategy inadequacy

Line 2 of Figure C-4 exhibits the known delayed but radical adaptation process of the focal organization that is upheld by the working of the reinforcing character of the *Repetitive Momentum* and *Attention Loops* which then also enforce how radical the behavior is. The reaction to the second market move is very different, as the organization now quite quickly adapts to the new direction of the market and implements what is implemented in the market with a time delay of only little more than one year. The behavior in the scenario including two environmental changes is different from the base run in which the organization remained with strategy B. While the repetitive loops are flexible the *Adaptation Pressure for B* loop, by which the organization adapts to the market, gains in importance again.

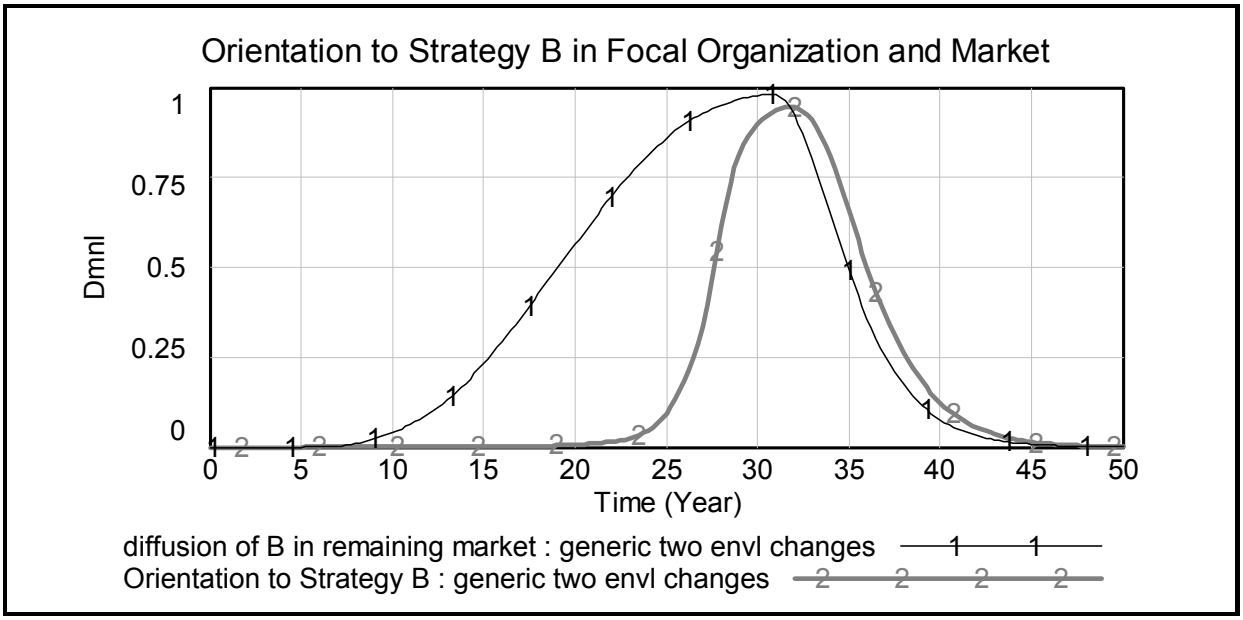


Figure C-4: Two environmental changes (BOT)[5]

A second reason why the adaptation to the second market shift takes place more quickly is that attention has already focused on those stakeholders who matter and who demand the second change. The stakeholders originally favoring B now pressure for the diminution of strategy B (meaning for less B), and as a consequence attention remains with stakeholders who originally favored B. The quick adaptation is possible because, first, inertia is lower than in the outset and the *Repetitive Momentum Loop* more flexible, and second, because the management team already focuses its attention on those stakeholders who demand the subsequent change. The hypothetical twofold change scenario is a clear example for the effects of previous change on the occurrence of further alterations. If initial change had enhanced the organization's ability to change, the existence of a continuously strong adaptive mechanism increases the occurrence of further change. But the base run scenario reveals in comparison that without the further activity of adaptive mechanisms, further change fails to appear.

D Possibilities of Managerial Intervention for Driving Change

In the latter scenario reduced inertia and the focus of attention proved to be important for the quicker adaptation to the second environmental change. Attention and inertia will therefore be analyzed as possible leverage points for intervention. It will be investigated how the management's influence on inertia and attention can shape the evolution of an organization and its alignment with the environment. This view concurrs with Bowen's position indicating that while affected by the pressure that arises from the system's structure, decision-makers still have the ability to either follow this pressure or make an autonomous decision (Bowen 1994, pp. 87–88 and 90; and Lane 2000, p. 10).

D.I Increasing the Responsiveness of Attention

Attention as a possible lever for management intervention can work in two different ways. An organization can either try to equally distribute its attention to stakeholder groups, or it can

[5] The *DEVELOPMENT OF STRATEGY B* is shaped differently after period 30 and includes a hypothetical second environmental change back to strategy A. The *number of stakeholders favoring B* is kept at 100 after period 30.

change its attention more flexibly than in the base case when stakeholders start to exert pressure for the implementation of another strategy. An equal distribution of attention may be desirable, but it would be unrealistic to assume that a management team is completely unaffected by past developments and by the intensity with which stakeholder groups exert pressure on the organization. The change in the importance of stakeholder groups and the process of allocating attention to them would remain unclear. Hence, there may be a small variability in the initial level of attention, but the main focus will be on the examination of attention allocation over time and on the effects of an enhancement of the responsiveness of attention.

An organization that changes attention more easily is simulated by increasing the yearly *reference fractional change in attention*. The management team would support employees to sense rising stakeholder groups more quickly, it would commission market surveys or buy information from market research institutes. These measures all aim at being informed about customers' and other stakeholders' desires and about the organizational strategy's reputation among these groups in order to then direct adequate attention to them.

The simulation reveals that the model shows sensitivity to an enhancement of the flexibility of attention. The sensitivity to these measures can be seen in Figure D-1. Compared to the base run (black line) it advances the change by two to three years. The significance of attention also becomes obvious from the sensitivity runs portraying parameter choices for the responsiveness of attention lower than in the base run. Even a minor reduction of the *reference change in attention* compared to the base run significantly reduces the adaptability of the organization, as can be seen in Figure D-1.

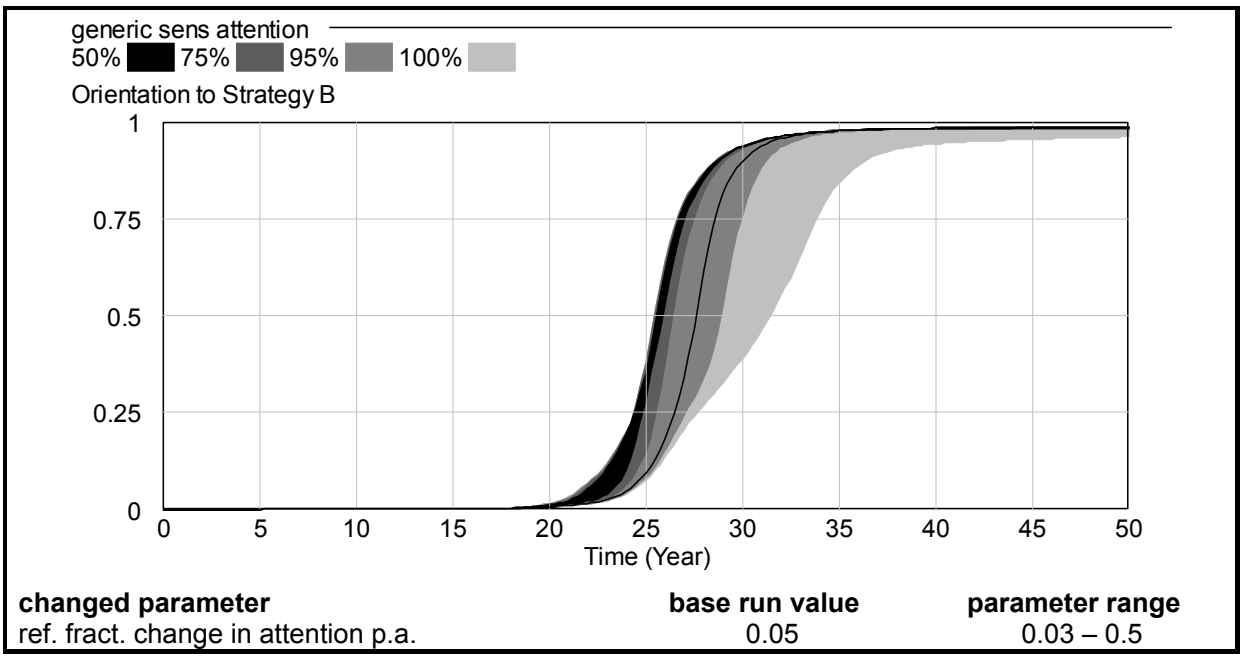


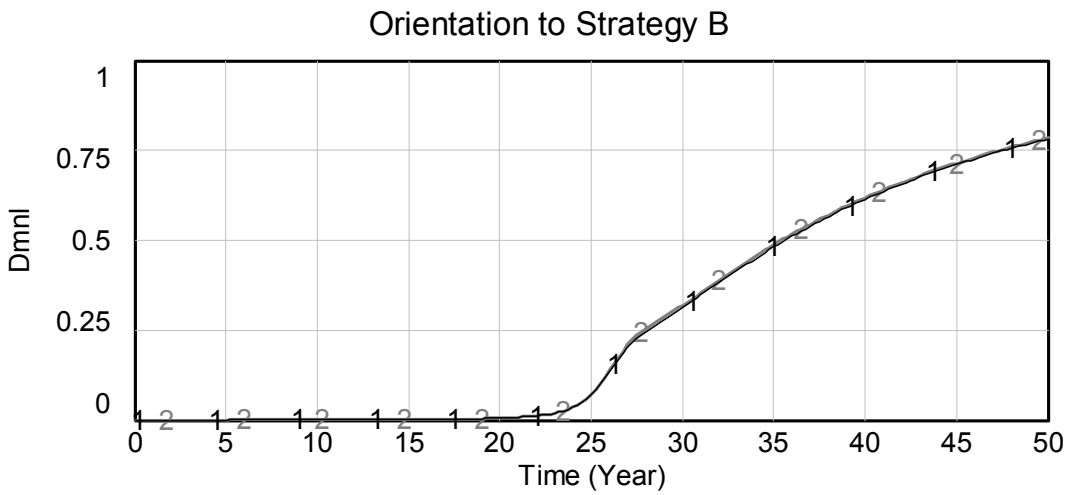
Figure D-1: Sensitivity for changes in adaptability of attention

The model reacts sensitively to changes in the responsiveness of attention, but even a high responsiveness does not cause a quick adaptation to changes in the organizational environment. Merely reducing the restrictive character of the *Repetitive Attention Loop*, e. g. by the active fostering of search activities for new stakeholders and their desires is thus no solution. Nevertheless it can be said that ceteris paribus higher attention to the new stakeholders favoring B is favorable for a quicker adaptation process, and a greater flexibility in adaptation is desirable. It increases the speed of adaptation by a couple of months or years.

D.II Inertia and the Ambiguous Effects of the Responsiveness to Pressure

Additionally, the effect that a diminished level of inertia has on the behavior of the organization will be considered. At the NYSE, one interviewee reported that the reason for high inertia within the organization is rooted in the inward-orientation of recruiting. People were grown from within, and there was very little turnover with people from outside the NYSE. This was different with Polaroid; 90 percent of the employees initially involved in the development of digital photography were new to the company. They developed a sound product, but its commercialization was thwarted by the management's grown convictions and beliefs in an old business model that did not fit digital photography. In the management area, no turnover took place. Once the management started to change, new people from outside were less entangled and locked in the old business model and embraced market developments with greater openness (Tripsas and Gavetti 2000, pp. 1152–1157). The replacement of culturally and ideologically aligned employees and managers with more open ones could have been a viable solution for the NYSE and Polaroid. Therefore the effect of different degrees of the decrease in inertia on the model behavior will be tested. At the London Stock Exchange, for instance, a consequence of the move to electronic trading was a permanent transformation of its membership. The stock exchange re-emerged as a more dynamic institution (Michie 1999, pp. 633 and 441).

Additionally, the strength of institutionalization processes in organizations deserves attention. Even at the relatively young digital photography company Linco, the opportunity for entering the USB flash drives business passed unnoticed. The company's quickly arising insistence on its identity as a photo memory or digital film producer refrained it from exploiting all options that opened up, e. g. in the area of MP3 players of flash memory (Tripsas 2009, pp. 450–451). Quick institutionalization can thus also cause high inertia and lock-in. It may result in a missing adaptation to the market and to the opportunities it offers. In a similar vein, DEC's inertia did not result from missing employee turnover. While the rate at which employees left the company may have been small, the organization grew rapidly and had a strong inflow of new employees from outside. But the culture of technological arrogance and missing market orientation was enforced by the leadership style and development programs which decreased the organization's ability to react to changed environmental circumstances (Gibbons 2003, pp. 97–102; and Schein 2003, pp. 80–89). At DEC the institutionalization process worked particularly well. The effect that an especially high institutionalization or low turnover rate have on an organization's strategy is shown in Figure D-2. It leads to a very slow adaptation to the market which has long-term side effects on performance that are detrimental to any company having fixed costs.



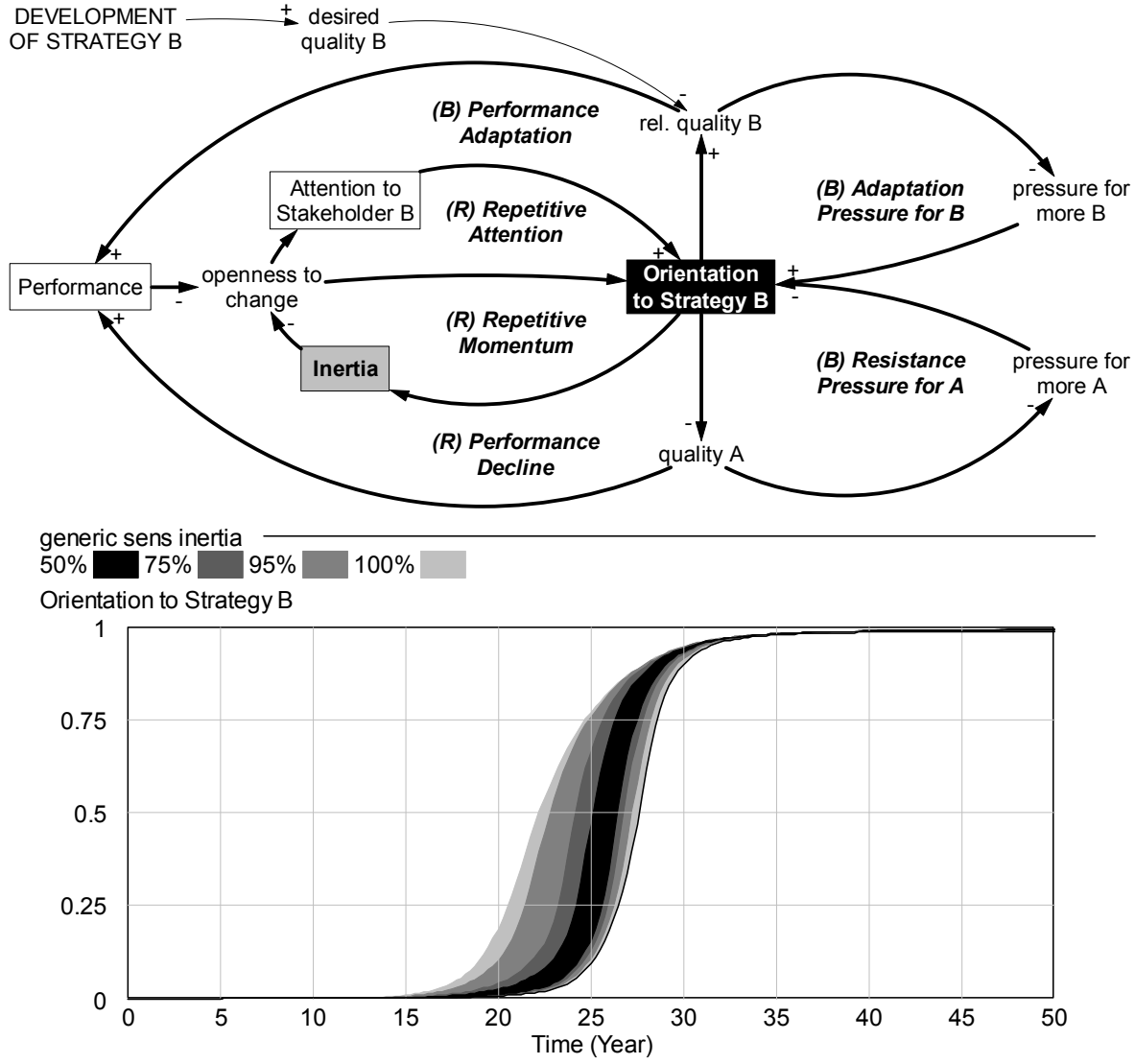
changed parameter	base run value	parameter value
1: ref. fract. inertia decrease	0.15	0.1
2: ref. fract. institutionalization	0.3	0.45

Figure D-2: Effects of high inertia (BOT)

Since the processes described above resulted in high inertia and missed opportunities for change, an analysis of the effects of low inertia is promising for testing the management's different possibilities of intervention. For this reason, the sensitivity for parameter changes of the initial level of inertia (*ini inertia*), the *reference fractional institutionalization* and the *reference fractional inertia decrease* is tested. The scenarios show the management's ability to intervene and to create an organization that is more flexible and adaptive to change. The upper part of Figure D-3 illustrates the area of parameter changes by a grey box and the variable which it may affect by a black box. The lower part of the figure displays the results of the sensitivity runs in comparison with the diffusion of B in the remaining market. The simulation runs reveal that reduced institutionalization as well as a higher rate of inertia decrease are able to trigger an earlier and often also radical orientation to strategy B. It proves beneficial to bring in new people with fresh ideas and a greater openness. The reduction of strong institutionalization processes, i. e. in the form of special trainings or the creation of an open-minded culture different from, for example, the engineering culture present at DEC also turns out to be valuable. They represent ways in which the management team can make the organization more malleable and drive change. Sensing opportunities and threats in shifting markets is a necessary requirement for an organization's ability to adapt to a changed market environment (O'Reilly III and Tushman 2008, p. 191). An open-minded management exhibiting low inertia is a necessary requirement for an organization to even be able to sense and seize the opportunities developing in the market.

It turns out that the lover inertia the better for the adaptive ability of the organization, Nevertheless, the comparison of the focal organization's to the market's orientation to strategy B in Figure D-3 indicates that even very low levels of inertia are not able to trigger an immediate adaptation. In the extreme situation in which no inertia is built (i. e. when fractional institutionalization and inertia decrease are equal at 0.2), several years pass during which the focal organization does not react. While the level of inertia has an influence on how quickly the organization reacts to perceived pressure. The reference reaction time is still rather long—or expressed diffe-

rently, the *reference fractional change in strategy per pressure* is low. It is a measure for the speed and the intensiveness of the reaction to perceived pressure. Therefore, the potential of a quicker/more intense reaction to perceived pressure will be tested. It distinguishes the rather change aversive base run organization from, e. g., a more decentralized organization. In the latter, employees are free to initiate their own changes if they perceive pressure to do this or room for improvement in their respective area. In this way changes may take place more easily despite initial managerial inertia. At the same time the repetitive momentum mechanism is not put out of action and alterations still transform the organization and reduce inertia.



changed parameter	base run value	parameter range
ini inertia	0.9	0.2 – 0.9
ref. fract. inertia decrease	0.15	0.15 – 0.2
ref. fract. institutionalization	0.3	0.2 – 0.3

Figure D-3: Sensitivity to variations of inertia

The upper part of Figure D-4 reveals that ceteris paribus an increase of the *reference change in strategy per pressure* does not have a great impact on the system's behavior. The increase in the change per pressure somewhat reduces the strength of the *Repetitive Momentum Loop* that keeps the organization locked at its initial strategy. The radical shift is triggered by the concurrence of

the strong *Adaptation Pressure for B Loop* and the *Performance Adaptation Loop* with the sudden decrease of the formerly dominant Repetitive *Momentum Loop*.

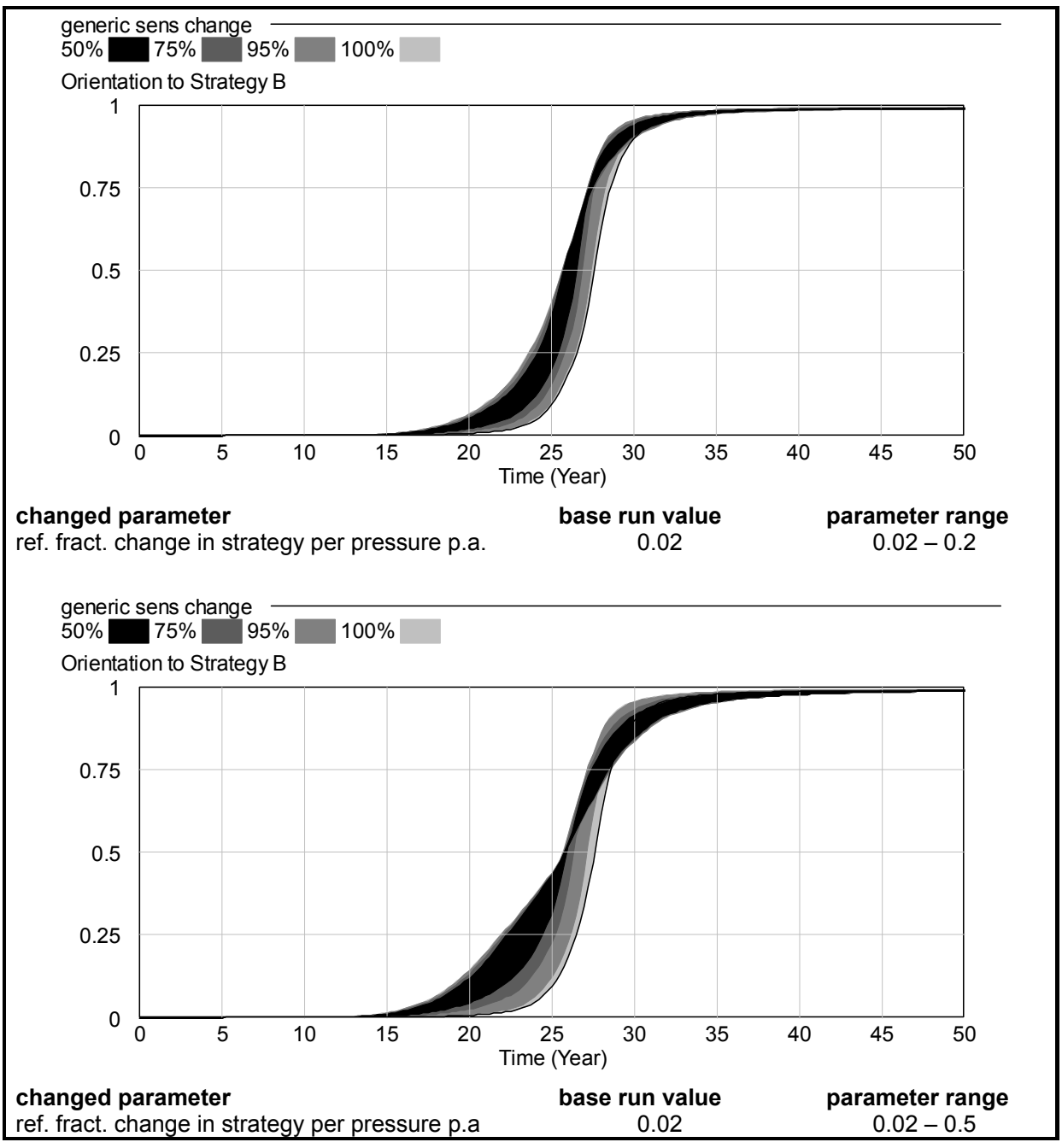


Figure D-4: Sensitivity for change per perceived pressure

As the bottom graph of Figure D-3 shows, even extreme values of the reference change in strategy per pressure do not lead to the desired result of an early and smooth adaptation. The transformation of perceived pressure into change action is still hampered by inertia and a biased perception of pressure. Adaptation takes place somewhat quicker in the beginning, but not in line with the rest of the industry. This even has counterintuitive effects. A somewhat quicker adaptation in the beginning results in a much slower orientation to strategy B in the end. While the strength of the *Repetitive Momentum Loop* is reduced, adaptation initially is quicker. But pressure

by stakeholders favoring B never built up as strongly as in the base run scenario. This means the *Adaptation Pressure for B Loop* never becomes as dominant.[6] The relationship between these balancing and reinforcing loops is nonlinear. The minor inadequacies that arise when the organization is reactive to pressure only create stakeholder reactions with less than proportional strength.

Overall, the mere increase of the reference change in strategy per pressure—that may symbolize a more decentralized organization that hands responsibility for change to its employees—does not arrive at the desired result of a quick adaptation to the environment. Higher than medium levels of the reference change in strategy may increase adaptation in the beginning, but lead to lower levels in the orientation to strategy B in the end. It is thus not advisable to react to all kinds of perceived pressure as quickly as possible.

D.III Joint Management of Leverage Points

So far the system's reaction to the change of attention, inertia, or the change per pressure, has been analyzed. The sensitivity to managerial intervention has been illustrated while one lever was changed and the other parameters were kept at the base run values. Neither of them was able to create an adaptive organization. Simulation runs reveal that only the joint influence on inertia, attention, and the reference change are able to trigger a smooth adaptation to the environment. An organization (line 2) that rather smoothly adapts to the environment (line 1) is shown in Figure D-5. It exhibits a low level of inertia, high flexibility in attention, and a medium responsiveness of its strategy to pressure for change.

Further sensitivity simulations also demonstrated the robustness of the policy implications of levers of change.[7] Independent of the flexibility of attention and responsiveness to pressure, it turned out that the lower inertia the better. Independent of inertia and the responsiveness to pressure, it can be said that the greater the flexibility of attention the better. Independent of inertia and attention, a medium responsiveness of the strategy to pressure for change proved best. The counterintuitive effect of the responsiveness to pressure thus still holds if the organization is more adaptive in other areas. The simultaneous amendment of several leavers was able to show that these recommendations are stable also in different situations. The investigation into the joint influence on points of leverage gives an idea of the freedom of action of management.

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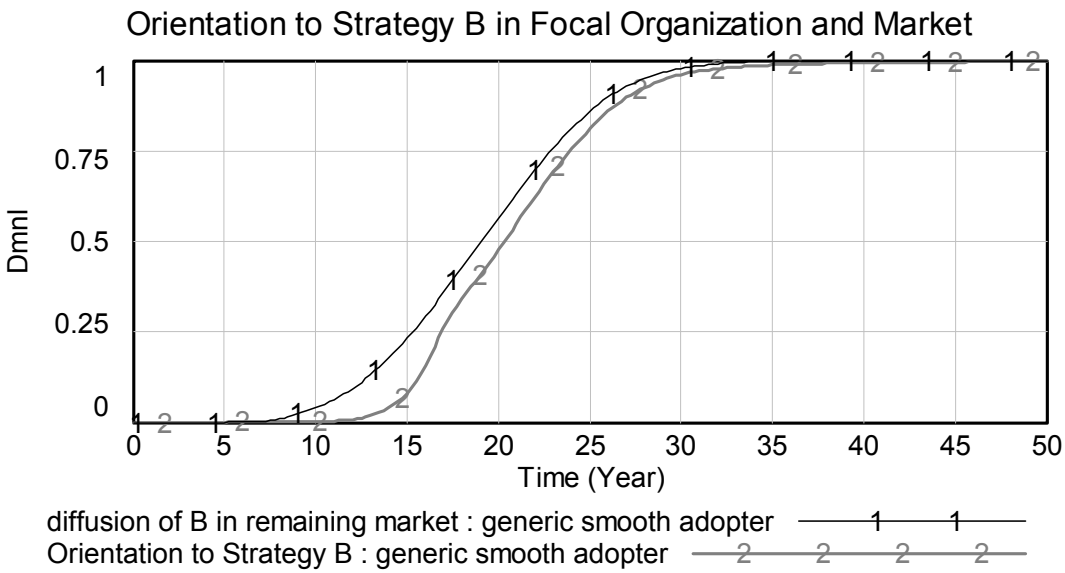
[6] The reason for the different behavior is rooted in the difference of the dominance of the Adaptation Pressure for B Loop, not in the slight nonlinearity of the effect of change on inertia. In their overall behavior simulation runs with a linear effect of change on inertia are hardly different from the ones shown.
It was also tested whether the limiting effect that comes into play if the orientation to a strategy is already very high affects the behavior. These limiting effects were explained and displayed in Figure B-9 on page 11. They account for a reduction in the implementation of further change, once the orientation to a strategy becomes high, but stakeholders still exert much pressure. The simulation tests did not find any differences in the pattern of behavior when it was assumed that the management fully implements all kinds of perceived pressure.

[7] Here, sensitivity simulations were run that kept most variables at values as shown in Figure D-5, while one parameter (set) was varied in the range between the base run value and the value shown in Figure D-5.



changed parameter	base run value	parameter value
ref. fract. change in strategy per pressure p.a	0.02	0.06
ref. fract. change in attention p.a.	0.05	0.3
ref. fract. inertia decrease	0.15	0.28
ini inertia	0.9	0.2
ini attention to stakeholders favoring B	0.1	0.3

Figure D-5: Smooth adaptation (BOT)

E Conclusion

The present analysis explained adaptive, inert, and radical organizational behavior. It showed that one causal structure is able to generate different modes of organizational behavior. This bears comparison with the family member test that analyzes whether a system dynamics structure is appropriate not only for a single case but for a class of phenomena and situations. It also checks whether the modification of parameter values is able to generate behavior appropriate for the class (Forrester and Senge 1980, p. 220; and Lane and Smart 1996, p. 110). More concretely it tested managerial policies and their interaction.

Given a certain type of environmental change, the decisions that guide the setup of the management team and its inertia are influential in deciding how the organization reacts to a given environmental change. A restrictive organization with a homogeneous management team that drives all decisions is likely to overlook important developments in its environment and neglect the rise of new stakeholder groups or of shifting stakeholder preferences. At the same time a management team can enhance its organization's adaptive ability by the active recruitment of employees from outside the organization who bring fresh ideas and are less inward oriented to the accustomed routines as people grown from within. Besides the active management of the composition of decision-makers in an organization, their institutionalization plays a decisive role. If they are too quickly engrained into the organizational culture and routines, the adaptive ability of the organization is thwarted.

While it is impossible to always pay equal attention to important stakeholders of an organization, actively trying to be attentive to stakeholders, maybe by surveys or market analyses, proved beneficial. Attention to stakeholders has mainly been considered and researched in the area of

normative stakeholder theory, a strand of business ethics. Descriptive research in this area is rare (Mitchell, Agle, and Wood 1997, p. 853). The present causal model has shown that many factors have an influence on the salience of a stakeholder claim within an organization. The causal structure was able to shown that it is important to distinguish the real stakeholder pressure from the perceived one. An important aspect of the postulated system dynamics model is that attention to stakeholders shapes the extent to which real pressure is perceived. It works as a weight for the real pressure. Additionally, the extents to which perceived pressure then gets implemented also depend on the organization's inertia and its general disposition or willingness to react to pressure. Hence the relationship between stakeholder attributes and resulting pressure on the one hand and the organizational outcome on the other hand is a complicated one.

For practical reasons it can be said that an increase in attentiveness is desirable, no matter what stakeholder group exerts the greatest pressure. It enhances the organization's orientation towards those groups whose dissatisfaction can lead to outcomes dangerous for the organization. Increasing the responsiveness of attention thus also increases the responsiveness of the organization's orientation to different strategies.

While low inertia and high flexibility in attention increase the organizational adaptability, trying to react to all kinds of perceived stakeholder pressure directly, e. g. by the delegation of power of decision to employees, is not necessary. A medium value of the responsiveness to perceived pressure proved to generate the best results concerning the adaptation to the environment. Even in a generally adaptive organization, specifications in the intensity to which the organization reacts to perceived pressure can lead to different patterns of behavior.

The interrelationship between environmental change and the factors influencing the subsequent organizational response were laid out. In particular the reaction to changes in the responsiveness to pressure revealed the mutual influence between the focal organization's decisions and the resulting intensity of stakeholder pressure.

While the present analysis increases the understanding of organizational attention to stakeholders and the interrelatedness of inertia, change, an attention in general, it has limitations. In the system dynamics model the effects of institutionalization processes and inertia on experience were excluded. Concerning the move from floor trade to electronic trading or the move from a complicated mini to a simpler personal computer, for example, this does not pose a problem. Nevertheless, there are organization and industries in which this is different. If a new strategy requires high human interaction or an enhanced technological proficiency, including the effects of experience into the model might prove useful. Additionally, the effects on performance—a variable that was kept rather simple in the present model—could be built in. The structure also allows for the testing of alternative environmental developments. The management team might try to orient towards the early adopters in an industry which implement change much more quickly. This changes the implementation pattern in the organizational environment, and it would be interesting to see whether different environmental patterns affect the policies recommended to the focal organization.

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