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Change Management and Innovation in the "Living Organization": The Stra.Tech.Man Approach

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Abstract. *This paper is part of the broader theme of change management studies with the view to present, in particular, the approach of managing change and innovation in terms of Stra.Tech.Man (Strategy-Technology-Management synthesis). After a brief review of the principal theoretical approaches and the main study directions in the analysis of the problem of change management, this paper examines the critical dimensions in the study of contemporary organizational change perceived in the theoretical perspective of a "living organism" as against the "mechanistic" approach to organizations. It concludes by examining change management in terms of Stra.Tech.Man, expounding and analyzing the five steps of Stra.Tech.Man as a new conceptual approach to managing change.*

Keywords: *change management; innovation; resistance to change; approach Stra.Tech.Man; business biology; business as a living organization.*

Introduction

Change is any transformation process on the way that an individual, group or organization acts as a whole, passing from a sum of ways and modes of acting and behaving to another, transforming relationships in the inside and outside environment (Andreoni & Scazzieri, 2014; Battilana & Casciaro, 2012; Choi & Ruona, 2011; Jaros, 2010; Robert, Yoguel, & Lerena, 2017; Scazzieri, 2018; Valentinov, 2015; van Witteloostuijn, Jacobs, & Christe-Zeyse, 2013).

In this way, the change and the overall modification procedure it stimulates generates and reproduces resistance and conflicts. In practice, every change creates and disseminates in a multiplicative way—to a greater or lesser extent—waves of produced changes, which incorporate the specific thoughts and actions, the "philosophies" and "procedures" that incubated them (Ates & Bititci, 2011; Dahl, 2014; Holten & Brenner, 2015; Whelan-Berry & Somerville, 2010). Change always causes the diffusion of structural contents and dynamics: Each partial change/action always causes a reaction that, in turn, will trigger in a cascade manner, another future action and, subsequently, a new reaction. In this way, in the context of organizational dynamics, every change is often the starting spark for a chain of future events that require mechanisms to manage the arising challenges (Ashkenas, 2013; By, Burnes, & Oswick, 2012; Hechanova & Cementina-Olpoc, 2013; Kuipers, Higgs, Kickert, Tummers, Grandia, & Voet 2014; Raineri, 2011; Steigenberger, 2015; Stensaker & Langley, 2010; Suddaby & Foster, 2017; Vora, 2013; Worley & Mohrman, 2014).

The change that an organization confronts with can also be systematically planned, or may appear suddenly, occur randomly and emerge unpredictably as non-scheduled and non-planned (Greenberg & Baron, 2014). In practice, changes occur daily within all organizations, before or after planning, while rarely the emerging change is only planned or unplanned: it is mostly a mixture. From the everyday organizational experience, it is clear that the process of change is always varied and multifaceted, and in turn touches and interconnects, to a greater or lesser extent, all the different sub-systems of each organization-actor.

In this context, change management processes are the forms and ways to design, implement, control, evaluate, and assimilate changes. In particular, a process of change may, to a greater or lesser degree, be imposed from a higher level or derive from the base; be centralized or participatory; be superficial or structural, depending on the particular "physiology" of the "living organism" which accepts and treats it, but also according to the particular nature of this change itself (Hodgson, 2013; Moore, 1993; Penrose, 1952).

Overall, the main question posed by this research is how to perceive innovation in an alternative way, based on the synthesis of strategy, technology, and management of each organization, and by studying the organizations with the theoretical perspective of "living organisms." The finding that all firms are living organisms contradicts with the pattern of organizational theory that tends to perceive the firm as a passive entity (a "machine").

Methodology and structure of the article

All the above dimensions, in their close interdependence and coexistence, are studied under the broader theme of change management that will be examined briefly in this paper. This study follows three steps in order to present a counterproposal in terms of "Stra.Tech.Man change management":

- Firstly, it examines the fundamental schools of thought (individual approach, group dynamics, and open systems) and the underlying analytical directions of the problem of change management.
- Secondly, it attempts a critical approach to the necessary dimensions discussed in the discipline of organizational change. It supports the gradual transition from the perspective of "classical/mechanistic" to the "organic" management (Japanese Management, Total Quality Management, Quality Circles, and the concept of the knowledge-creating company). In this context, it also studies essential dimensions in the study of organizational change, that is, the organizational reception to change, the resistance to change, and the overcoming of resistance to change.
- Finally, it presents the critical points of change management from the perspective of the "living" organizations in terms of Stra.Tech.Man, which brings forward a new approach to this problem.

Theoretical cradles and the main study directions in the analysis of change management

The problem of managing change is not a "definitively settled" scientific field so to have clear and strictly determinate thematic boundaries and one-dimensional methodological prerequisites. On the contrary, modern theory and practice of change management arise through the convergence and interconnection of a large number of disciplines in the social sciences and various conceptual interdisciplinary traditions (Burnes, 2000). In short, this section will look upon the schools of thought and the theoretical evolution of the defined subject.

The fundamental schools of thought in change management

By tracing the roots of the theoretical approach of change management, in particular, three leading schools of thought can be distinguished (Beckhard, 1969; Bridges, 2004; Conner, 1993; Jick, 1993; Kotter, 1996; LaMarsh, 1995; Lewin, 1948; Phillips, 1983; Rogers, 2003): the individual approach, group dynamics, and the open systems.

The school of individual approach

The theoretical perspective of the individual thinking approach distinguishes two main groups: the Behaviorists and the Psychologists of the Gestalt approach. Overall, the former tend to consider the behavior as a result of interaction of the person/actor with the environment, while the latter believes that this view only gives a partial explanation of the situation, claiming that the behavior of the person/actor is a simultaneous result of the environment (Arthur, Inkson, & Pringle, 1999; Brower & Nurius, 1993; Lifton & Zimpfer, 1972; Sanford, 1969; Sundel, 1985).

The behavioral theory is dominated by the analytical view that argues that behavior is acquired and learned, with the person/actor being the receiver of external and objective data (Pavlov, 1927). As an analytical derivative, one of the basic principles of the behavioral approach is that the expected consequences determine human actions. In the practical application of behaviorism, the external environment, which modifies the behavior, always involves a stimulating manipulation in order to achieve the desired activity. The goal is to reward the desired behavior in all cases immediately. This approach reflects a reaction to the classic stream of thought that treats people as "mechanical gears" that respond exclusively to external orders.

On the contrary, for Gestalt theorists, learning is a process that involves acquiring and changing perceptions, expectations, or thinking patterns on behalf of the actors. To explain, therefore, individual behavior, the psychologists take into account not only a person's actions and results but also the personalized interpretation that individuals give in their practical choices. Consequently, the proponents of Gestalt approach set as their primary objective to help individuals in an organization to change their self-awareness and therefore the situation that in turn will lead to behavioral changes (Smith, 1982).

In the field of change management, both approaches have been successful in their application during the past recent years. Many authors have also highlighted methods of parallel use of Gestalt and behaviorism, proposing functions of both individual

motivations (external stimuli) as well as discussion, participation and dialogue methodologies (Kohler, 2015; Lowry, 2017).

The school of group dynamics

This approach traditionally emphasizes the prevalence of organizational change through working groups and social groups rather than individuals. Its analytical logic is based, according to Kurt Lewin (Lewin & Cartwright, 1952) in investigating the compulsory teamwork of individuals within an organization. In this theoretical perspective, individual behavior must be treated as a derivative, in the light of the dominant group's practices and rules (Forsyth, 2019; Friedkin & Johnsen, 2014; Levi, 2016; Reichert, 1970).

In particular, Lewin's central hypothesis is that group behavior is a complex set of symbolic interactions which not only affect and transform group structures but also modify individual behaviors. As such, he argued that individual behavior is a function of the "collective environment"—a field, as he called it: This field produces forces and tensions that stem from the group pressures that each member receives. Lewin suggested that there is no steady balance for the group, but on the contrary, there is always a continuous process of mutual adaptation, a "quasi-static equilibrium."

Concerning the dissemination of change, this school of thought argues that the personalized effort of changing behavior is insufficient in change management terms, since the person is always forced to comply with group pressures: The focus on change should be made at the group level, concentrating on ways to influence and change the collective rules, roles, and values. The "rules and norms" are standards that define what people need to do, think, or feel in a given situation. The "roles" are patterns of behavior with which individuals and groups are expected to comply. The "values" are the ideas and beliefs with which individuals and groups perceive and judge what is right or wrong.

In modern management theory, such an approach seems to have a relatively limited impact. However, the group dynamics perspective has greatly influenced both the theory and the modern practice of change management. Today, most organizations perceive their structural "physiology" as a set consisting of teams and groups, rather than a simple aggregation of individuals (Davis, 2016; Pinto, Marques, Levine, & Abrams, 2016; Waller, Okhuysen, & Saghafian, 2016).

The school of open systems

Having approached change as a separate subject for individuals and groups, the school of "open systems" attempts to address the organization in its totality (Richard, 2014; Scott & Davis, 2017; Warmington, Lupton, & Gribbin, 1977).

This school of thought conceives the organization as a set of interconnected subsystems. It argues that any change in one part of the system inevitably results in similar changes in other parts of the system and, consequently, the transformation of the overall structure and performance of the organization takes place (Scott, 1987). In essence, systemic approaches choose as their central methodology the description and evaluation of discrete subsystems, defining ways of change that improve overall functions of the organization. This analytical view, at the same time, does not see

organizations as isolated systems: It understands that there is an open interaction with both the external environment and the interior between the various subsystems that co-create and coexist. Moreover, in this approach, it becomes clear that internal changes in a system area inevitably affect other areas and, in turn, affect the external environment, and vice versa (Buckley, 1968).

On this matter, and according to Miller's classic approach, there are four main subsystems (Miller & Rice, 1967):
- The goals and values subsystem of the organization that corresponds to the defined goals and values promoted by the organization.
- The technical subsystem that corresponds to the knowledge, techniques, and technologies required by an organization to operate.
- The psychological subsystem that corresponds to the general organizational climate and culture, that is, the network of relationships and roles, values, and rules that "tie" people together.
- The administrative subsystem that extends across the organization and is responsible for associating the organization with its environment, for setting goals, and plan structures and procedures.

Although this approach's extent and impact is generally acknowledged, it is worth highlighting some inevitably interpretive deficits. As noted by Butler (1986), social systems are complex entities that defy, most often, descriptions and analyses; therefore, to classify all cause and effect relationships can be disorientating. In a similar critical direction, Beach (1980) points out that open system theory does not contain a coherent and formulated theory as the majority of its approaches are abstract concepts; to be useful in the management and leadership practice open systems theory has to move in more robust and widely operational data.

In conclusion, these three leading schools of thought have fundamentally paved the way for the theory of change management:
- All three approaches to change focus at different levels of organizational life (individual—group—overall organization), and consequently, each poses different priorities to the examination of the management process of change.
- Although each school of thought separately seems to be embraced by the conviction of a more integrated and practical approach to change, these are neither mutually exclusive nor are in a straight conceptual conflict. They are complementary and synergic.
- All modern organizational models and approaches are directly related to the above-mentioned approaches, which focus respectively on individuals, groups and organizations as a whole, all of which are in direct opposition to the mechanistic approach of the "classical school" (Carroll & Gillen, 1987; Kitana, 2016; Mahmood & Basharat, 2012; Parker & Lewis, 1995).

The theoretical development of the subject of change management

The evolution of the subject of change management has been following three basic directions over the last decades:

(i) The gradual transition from the analytical perspective of "classical/mechanistic" management to the "organic" management.

(ii) The dynamics of participation in "Japanese Management," the "Total Quality Management" and "Quality Circles."
(iii) The emergence of the importance of tacit knowledge and the knowledge-creating company.

The gradual transition from the analytical perspective of classical/mechanistic management to the "organic" management

Nowadays, the theory of change management does not consider analytically useful many elements of classical/Taylorist management, but rather, quite the contrary, it treats them—entirely justified by this paper—as barren and relatively "oblique." The modern theory of management perceives that no organization can be regarded validly as a "simple machine" (Burns & Stalker, 2011) and, therefore, any change process is not a "simple change of features." A comprehensive conception of the organization must, therefore, understand the groups and members of the organization in a synthetic, social, symbolic, value, and communicative context, otherwise any attempt to manage change sooner or later might end up in failure. In this direction, it seems that the world is entering a profound "paradigmatic" (Kuhn, 1962) change in this field of research nowadays (Table 1).

Table 1. From classic management to modern management

Classic management	**Modern management**
Organization = Machine	Organization = Social organism
Employee = Gear	Employee = Social being with sentimental and social needs
Search for the "one best solution."	A multiplicity of environmental problems and solutions
Alignment of decisions	Complex and deficient decision making
Order = Top-down	Interactive communication: downwards and upwards, horizontal and diagonal
Organizational change = Machine repair	Organizational change = evolution of socio-economic system

The dynamics of participation in Japanese Management, Total Quality Management, and Quality Circles

The participatory logic of "Japanese management" and, more specifically, the systematic methodology of Total Quality Management is a useful concept to better understand the process that makes an organization capable of receiving and managing change more effectively (Jackson & Tomioka, 2004; Kaplinsky & Posthuma, 2013; Reeve, Baird, & Jia Hu, 2011; Stewart, 1996).

The innovation here is not an "instantaneous leap" of the organization, but a standard and step-by-step procedure. The adopted logic of "Just in Time – JIT" (De Stefano, 2015; Humphreys, 2011) is structurally reinforcing the speed of the organization's reflexes, while the philosophy of continual improvement (kaizen) offers the organization an

increased adaptability, both passive as well as energetic (Ramis-Pujol, Suárez-Barraza, & Kerbache, 2011).

Total Quality Management (TQM) describes how an organization is trying to assimilate a business culture where employees aim at constant improvement by providing high-value products and services. Total Quality Management refers to how different segments of production are geared towards the combined improvement of their operations. At the same time, business executives are required to manage the business through permanent goal setting and training with the ultimate goal of improving quality at all organizational aspects (Spencer, 1994; Zehir, Ertosun, Zehir, & Müceldilli, 2012).

A quality circle is a group of people who work in the same or similar task and must hold regular and systematic meetings to identify, analyze, and solve problems related to their work. Typically, the quality circle consists of a group that is relatively small in size, guided by a supervisor/manager. Team members usually implement solutions on their own to improve the performance of the organization and gain a more profound incentive for themselves. The quality circles, which were most popular during the 1980s, still exist today in the form of Kaizen groups and similar operational group collaboration schemes (Badurdeen, Marksberry, Gregory, & Kreafle, 2010; García, Maldonado, Alvarado, & Rivera, 2014; Mackelprang & Nair, 2010).

The emergence of the importance of tacit knowledge and the knowledge-creating company

At the same time, the approaches to the "knowledge organizations" (Brătianu, 2016; Hadad, 2017; Maybury, 2002; Niculescu, 2015; Nonaka & Toyama, 2015) provide us with a comprehensive theoretical basis for understanding in depth how change management is related to the process of organizational learning and development (Breslin, 2016; Zollo, Cennamo, & Neumann, 2013). In the absence of effective mechanisms for assimilation and diffusion of knowledge within the organization, without creating the conditions for adequate reception of the "new," any attempt to manage change can only be insufficient.

Based on this approach, it is essential to redefine learning in an organization (Argote, 2012; Jiménez-Jiménez & Sanz-Valle, 2011) as the accumulation of existing knowledge from internal and external sources and its diffusion into the interior. This process involves, first of all, the transformation of data into information. Then, only after the information is "filtered" and assimilated by the organization, it results in organizational knowledge. Based on this evolving framework of understanding, the organization articulates its adaptive actions to the dynamics of its external environment and, at the same time, develops the capabilities of data processing in order to produce accurate and useful information (Figure 1).

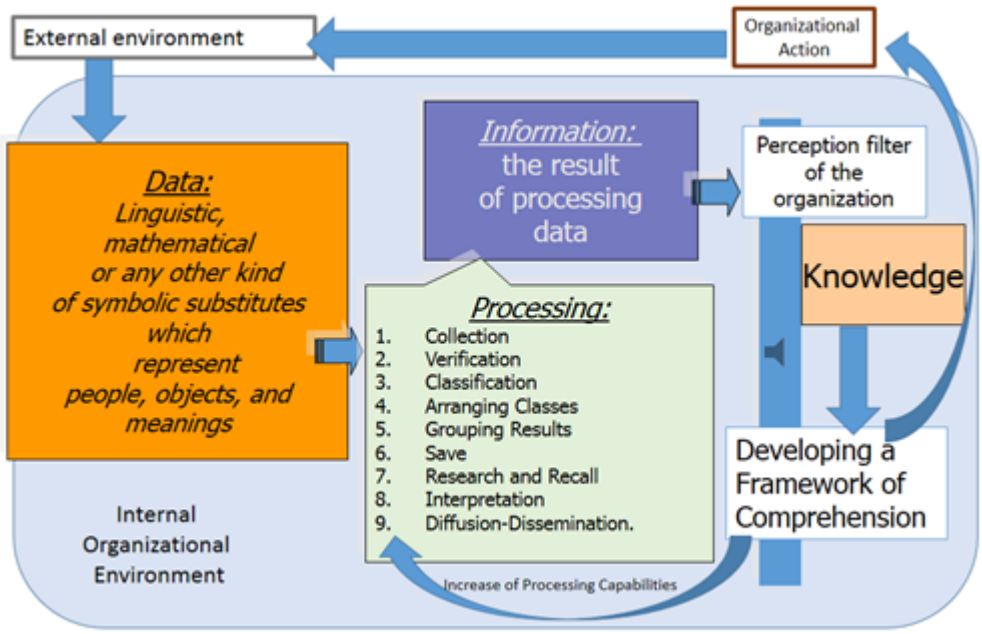


Figure 1. From data to knowledge

In this regard, the distinction between explicit and tacit knowledge (Park, Vertinsky, & Becerra, 2015; Peter, 2008; Venkitachalam & Busch, 2012) is of great importance. Specifically, explicit knowledge is the one that is encoded or recorded in the form of rules or instructions, while tacit knowledge is coming from experience and is strongly personal. In practice, tacit knowledge is based on personal experience, work experiences, professional intuition, and everyday practice, and can hardly be coded and transmitted through conventional training. On the contrary, explicit knowledge is official, conventionally transferable, and can be quickly recorded, encoded, and copied (Nonaka & Takeuchi, 1995) (Figure 2).

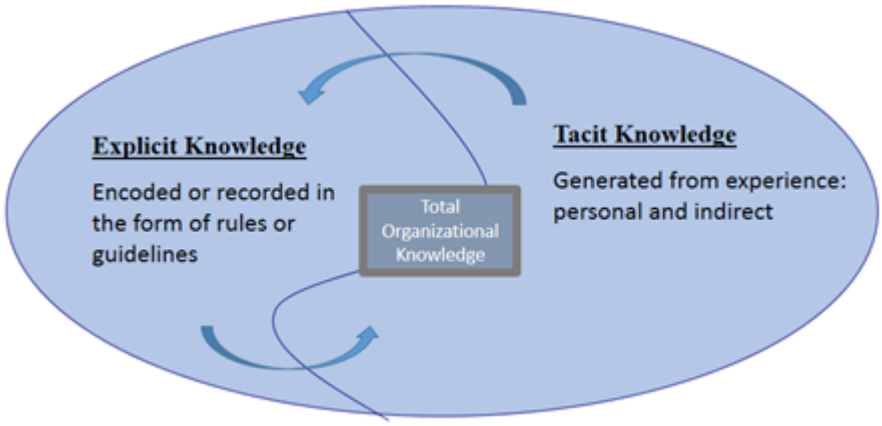


Figure 2. Explicit and tacit knowledge (Adapted from Nonaka & Takeuchi, 1995)

The basic dimensions in the study of organizational change

In the related literature, there are usually two necessary forms of change within an organization: the gradual and the radical change (Collins & Hill, 1998; Jain, 2013; McAdam, 2003). The gradual change reflects a series of continuous changes and developments within the organization; this form of change manages to maintain its overall structural balance and affects directly and drastically only one part of the organization at a time. On the contrary, the radical change, when it occurs, manages to break vertically and rearrange the entire frame of reference of the organization, transforming all the organizational dimensions.

Also, another perspective distinguishes changes between the first and second in order. The first change in order is a continuous change that does not involve significant changes in the way an organization operates. A "second class" change can be radical, with significant alterations in many different levels of the organization.

In a similar analytical orientation, there is also the distinction of change in the basis of three distinct models:

a) The incremental model of change (Carter, Armenakis, Field, & Mossholder, 2013; Edelman & Benning, 2004) perceives changes as a process where the personalized pieces of an organization incrementally and separately face one problem/one goal at a time (Miller, 1984).

b) The punctuated equilibrium model (Baumgartner, Jones, & Mortensen, 2014; Boushey, 2012; Mudambi & Swift, 2011; Zhang, Liang, & Fan, 2017) that perceives organizations to evolve through relatively long periods of stability (equilibrium periods) in their main patterns of activity and which are interrupted by relative small "outbursts" of fundamental change (revolutionary periods). These revolutionary periods, the "epochs of eruption," disrupt the established patterns of activity and set the foundations for new periods of equilibrium.

c) The continuous transformation of change model (Brännmark & Benn, 2012; Järventie-Thesleff, Moisander, & Villi, 2014; Rees & Rumbles, 2012) argues that in order to survive, organizations need to develop their ability to permanently and continuously change (Brown & Eisenhardt, 1997).

Overall, all the previous approaches are not analytically mutually exclusive, but instead, they can be inter-fertilized in the light of an approach that focuses on the "living" nature of organizations that face changes.

The organizational reception of change

There is no doubt that there are times when organizations are more likely to change efficiently and successfully, and others that do not. A change occurs most effectively when the people involved estimate that the benefits will outweigh the costs that will have to undertake. In this process, when a new idea develops, the "idea champions" of change actively promote it—and thus create the necessary organizational support for it—overcome resistance and ensure its implementation (Robbins & Judge, 2011). However, whether or not organizational change will be successful in an organization

depends on the beliefs and demands of its people concerning the expected benefits and costs that will result from the implementation (Figure 3).

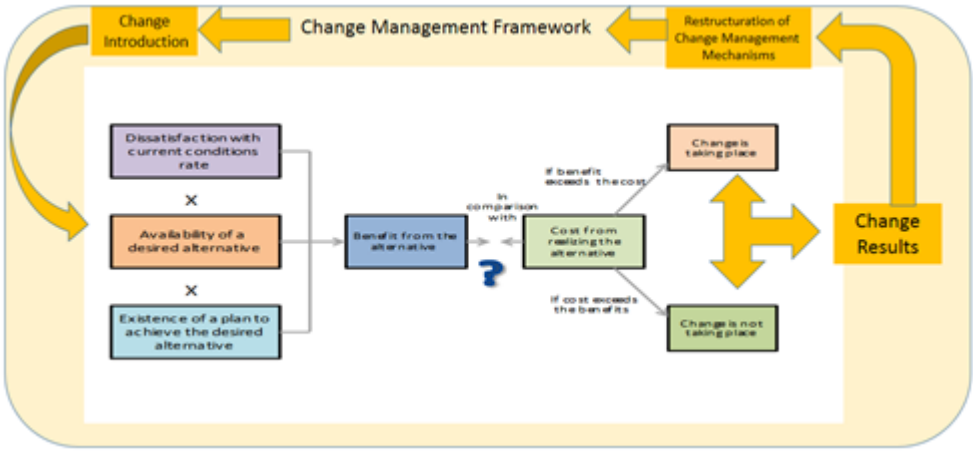


Figure 3. Benefits and costs of change (Based on Greenberg & Baron, 2014)

Therefore, it appears that the factors that enhance the benefits derived from implementing a change are:
- The extent of dissatisfaction with the current/prevailing conditions.
- The availability of distinct alternatives.
- The existence of an integrated plan to achieve this alternative.

From this perspective, it becomes clear that any attempt to change cannot be successful when either it is not based on a sufficiently assimilated dissatisfaction feeling within the organization, or does not propose a clearly "preferable" alternative, or does not have a well-thought transformation plan. Unfortunately, very often, in all kinds of organizations, "naive voluntarism" prevails over such a pragmatic approach and very often even a mechanistic understanding of change prevails.

Resistance and reaction to change and the emergence of conflicts

The resistance to change (Barabasz & Bełz, 2014; Blom, 2018) is an expected situation since every attempt to change will necessarily change the balance of power within the organization. The reaction to change occurs as the force coming from individuals, groups, or entire bodies of organizations, and which tends to deny, prevent, restrict, or even altogether cancel the effort of the necessary changes.

The reaction to change is not, of course, a painless process for any organization. Very often, the failure to monitor, respond or assimilate a change causes and deepens the crisis of the organization, while this worsening crisis—in any organization, of any size and range—manifests through a chain of explosions, as each problem manifests even more problems around it and so forth. The deriving conflict is the realized disagreement between two or more parties and forces, the dynamically expressed deviation between two or more views, positions, or powers. However, beyond the usual negatively charged prejudice around the concept of conflict, in fact, conflict is not always a negative phenomenon for an organization and should not be considered "by definition" as such, even if the confrontation requires intensive administrative effort and valuable resources

from the management. Therefore, conflicts can often cause an "explosion" of creative energy (Anderson, Potočnik, & Zhou, 2014; Baer, 2012; Hirst, Van Knippenberg, Chen, & Sacramento, 2011) in solving problems and lead to real innovation within an organization.

That is why modern management theory seems to consider now conflicts as a potential power of renewal in enterprises and, therefore, seeks ways to handle them productively. Therefore, resistance to change and the conflict that it may generate can be positive and constructive, if lead to an open discussion, debate, and synthesis (Conflict management) (Spaho, 2013; Susanto & Shih, 2010; Zhang, Cao, & Tjosvold, 2011). All these reactions are draining vital energy from the organization in times when vital energy is most needed. Naturally, resistance to change is created not only from individuals but also from a variety of organizational fields.

At the same time, international research in the field has revealed that resistance to change (Georgalis, Samaratunge, Kimberley, & Lu, 2015; Marques Simoes & Esposito, 2014; Thomas, Sargent, & Hardy, 2010) does not necessarily arise through formally recognizable forms and ways: It may be explicit or inexplicable, direct or indirect, rapid or deferred. For the leadership, it is easier and more effective to deal with open and immediate resistance, such as complaints, work slackening, or threatening to strike. The biggest challenge, however, is to deal with the resistance that is silent, "underground" or deferred, which is way more challenging to handle. Reactions in this category usually entail a significant loss of loyalty and efficiency in the incentive mechanism of employees, increased "voluntary" errors and failures, and are much more challenging to identify. The delayed effects can also hide the link between the change and response to it, as it can occur weeks, months, or even years later.

Effectively overcoming the resistance to change

The organizational crisis is a phase of persistent failure in the implementation of change, which drastically exacerbates the conflicts involved. Therefore, it seems that the only sustainable way out of any crisis is innovation at all levels (Crossan & Apaydin, 2010; Drucker, 1986; Naranjo-Valencia, Sanz-Valle, & Jiménez-Jiménez, 2011; Wolfe, 1994). In the end, the only way to innovate efficiently and manage change efficiently for a long time is by showing constant care for organizational development and evolution of the organization (Vlados, Deniozos, Chatzinikolaou, & Demertzis, 2018a, 2018b).

However, to overcome the resistance to change and choose the best possible path requires an "open mind" and skills of organizational synthesis:
- Resistances must be accepted and treated calmly and not be suppressed and covered.
- Information about the need for change must be moving freely and not be kept in the hands of a small minority at the top of the organization.
- The plan for change must, first of all, convince people of the organization and not be merely imposed on them "from above."
- Always people and the groups of each organization should be helped to learn new things that will help them assimilate the change fruitfully.
- A prerequisite for effective assimilation of change is actual trust in the people of the organization and their participation in decision-making.

A classical approach to why members of an organization react to change is offered by Paul Strebel (1996), who explores the causes of workers' reaction to change (Why Do Employees Resist Change?). The author considers, in particular, that the failures have a common root, as changing is perceived differently by the senior management and differently by the staff. Therefore, the author proposes replacing the conservative culture of risk avoidance, with another in which employees are fully committed to the pursuit of change. In this direction, managers need to reconsider the mutual obligations and commitments that exist between employees and the business, and in this direction, leaders can overcome workers' reaction to change by redefining their relationships.

The firm as a "living organism" and the management of change in Stra.Tech.Man terms

This paper argues that we can give more transparent and intrusive answers if we drastically enrich the theoretical perspective of change management with a "biological type" of perception of the evolutionary dynamics of the social organisms under study (Boulding, 1981; Boyer & Saillard, 2002; Coriat & Dosi, 2002; Coriat & Weinstein, 1995; Euroconsult, 1984; Lordon, 1993; Nelson & Winter, 1982).

The firm as a living organism

Over the past two decades, a renewed stream of thought in organizational science has been markedly strengthened, which necessarily intersects with the problem of organizational change management and which calls for a new theoretical perspective, which starts from conceptualizing and studying the firm as a living organism (Wagner, 2007; Zeleny, 1980). The main message calls for a definitive transition from "engineering" to "business biology" (Table 2).

Table 2. Mechanical vs. Biological perception of economy and business (Battram, 1999)

Mechanical	**Biological**
Organization as a factory	Organization as a garden
Staff development as "annual maintenance"	Staff development as "plant treatment"
Occasional oversee is required	Continuous interaction is needed
A complex system composed of simple systems	A complex adaptive system consisting of complex adaptive systems
Fundamentally a "closed" system	Fundamentally an "open" system
Remains the same (but worn out)	Grows
Systems based on detailed procedures	Continuous improvement based on shared values

Stewart Kauffman (1993), in particular, links this new science of biological complexity to traditional science from a long-term perspective, as shown in the following table (Table 3).

Table 3. Development of science (Kauffman, 1993)

18th century	
Newtonian Revolution	Develops the science of organized simplicity
19th century	
Statistical engineering	Focus on unorganized complexity
20th century	
Biology Renaissance	Faces the sciences of organized complexity

As Arthur Battram (1999) has pointed out, all firms/organisms are complex adaptive systems. These organizations are not machines but complex adaptive systems within an evolving environment. Moreover, a creative and adaptive behavior always arises from the interaction of the independent actors of a system, within an imbalanced environment. For this, even if a complex adaptive system once reached the final balance, this does not mean that it is just stable, but it is finally dead.

To this end, the classic work of Arie De Geus (2002) "The Living Company" is noteworthy, arguing that the majority of entrepreneurs today wrongly treat firms as mere "machines" that produce money and wealth, ignoring the essential similarities that these have with living organisms. Firms are "dying" because managers are more focused on the economic activity of producing products and services, and forget that the true nature of organizations is, in fact, a human community.

The contribution of Kevin Kelly (1995, 1999, 2011, 2017) follows a similar direction, expanding the "living perception" of the firm further. Kelly notes in particular that the components of socio-economic systems that seem to operate freely and according to the principle of "laissez-faire" have elements that are very different from those imagined by scientists. If we give these systems the necessary time and space, they will take a form which in all features resemble a living organism. Kelly (2017) concluded that the way the literature and people of everyday practice perceive business operation must change. Instead of understanding the firms based on the industrial model (i.e., as production lines and separate mechanical entities), we must treat them as part of an ecology of organizations. A vital feature of the biological model is that there are not only dependency hierarchies but also hierarchies of interaction. In such a "living network," there is no linear causality because it is difficult to tell what causes what. Here there is a kind of circular causality that means the existence of what Kelly calls a "field of causes."

Nowadays, the biological treatment of business organizations and their structures are receiving a steadily increasing support. Among these supports, there is Christopher Meyer. Specifically, Meyer and Davis (2003) have published a book called "It´s Alive," in which they deal precisely with this issue: the creation and, above all, the "death" of enterprises, but viewed with an anthropocentric dimension since they talk more about managers and less about the organization as a whole.

In conclusion, the potential of approaches that follow the "living firm" explanatory path adds substantial "doses of realism" to the organizational and business science. The distancing from the detailed oversimplifications of classical/Taylorist management is necessary to the extent that we need to understand the root of innovation. Innovation is an indelibly adaptive, evolutionary, and "biological type" action of all kinds of

organizations to survive and develop within an increasingly challenging and full of opportunities, global external environment.

The foundations of the Stra.Tech.Man approach

The "Stra.Tech.Man" approach as an alternative analytical platform that assimilates an evolutionary and "biological" perspective in the analysis of business dynamics can be a counter-proposed framework of change management. In particular, the "Stra.Tech.Man" model distinguishes the "physiology" of organizations based on three fundamental questions at the root of their strategy, technology, and management.

These questions, to which all organizations are called upon to respond (either explicitly or implicitly) and ultimately determine their innovative potential, are as follows:
- The strategy responds to "where is the organization currently, where it plans on going, how does it go there, and why?"
- Technology responds to "how does the organization draw, synthesize, diffuse, and reproduce the means of work and know-how, and why?"
- The management responds to "how does the organization use the available resources, and why?".

The main findings of the Stra.Tech.Man approach, which stems from the related field research (Vlados, 2004, 2005, 2012; Vlados, Katimertzopoulos, & Blatsos, 2019), are the following:
I. All firms/socio-economic organizations, even of a similar size, as living organisms, belong to different natural species, are different "animals." Any firm/socio-economic organization has its "biological identity," which contains all the structural information that determines the possibility of "biological development." Three fundamental and interconnected spheres of analysis always determine the "biological core" of every living firm/socio-economic organization in order to compete for survival and development within the ever-evolving environment: the production and reproduction of strategy, technology, and management. With these components, any firm/socio-economic organization formulates its unique Stra.Tech.Man evolutionary triangle.
II. Any firm/socio-economic organization always combines the co-existing spheres of strategy, technology, and management. Organizational success is never the outcome of a single sphere, but a combination of the three, in the way in which their synthesis manages to provide sufficient "responses" to the changing environment.
III. In this way, every firm/socio-economic organization has to synthesize—in its way effectively and according to its particular "physiology"—in order to survive and develop in the ever-changing environment—the potential of strategy, technology, and management. This synthesis by the firm must aim at the innovation that will enable to protect (and develop) the competitive advantage and maintain profitability.
IV. The "answer" to each sphere of the Stra.Tech.Man triangle prescribes the "answers" to the other two. One "answer," to a significant extent, specifies, sets the constraints and opens up new opportunities for transformation for the other. At the "innermost" level of each organization, there is a "physiological unity" that specifies the possibilities and limits of physiological adaptation (Figure 4).

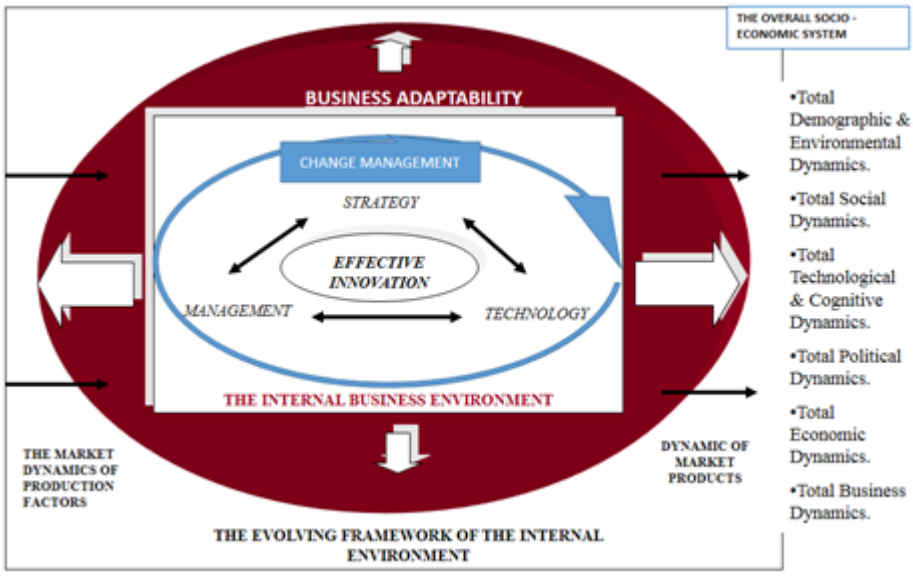


Figure 4. The dynamic synthesis of Stra.Tech.Man and the management of change

V. Any firm/socio-economic organization, within its particular capabilities, on the path that determines its type and particular "physiology" as the birth of its unique evolutionary course, and not its "pure decision" does the following:

- Builds and transforms its particular physiology as a synthesis (as a constant dialectical product: thesis-antithesis-synthesis) of the implemented business philosophy and business procedures
- Prepares and activates the mechanisms of understanding its environments, both internal and external, by synthesizing its actions and initiatives in terms of Stra.Tech.Man (Figure 5).

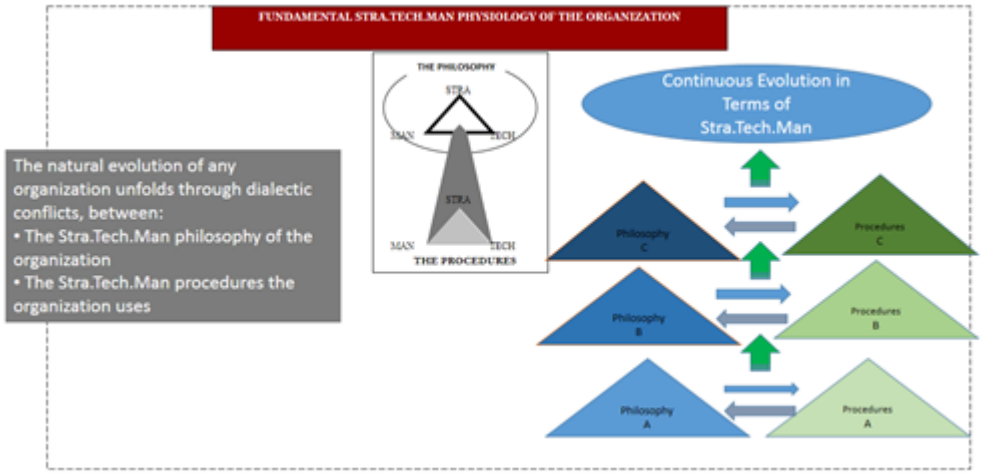
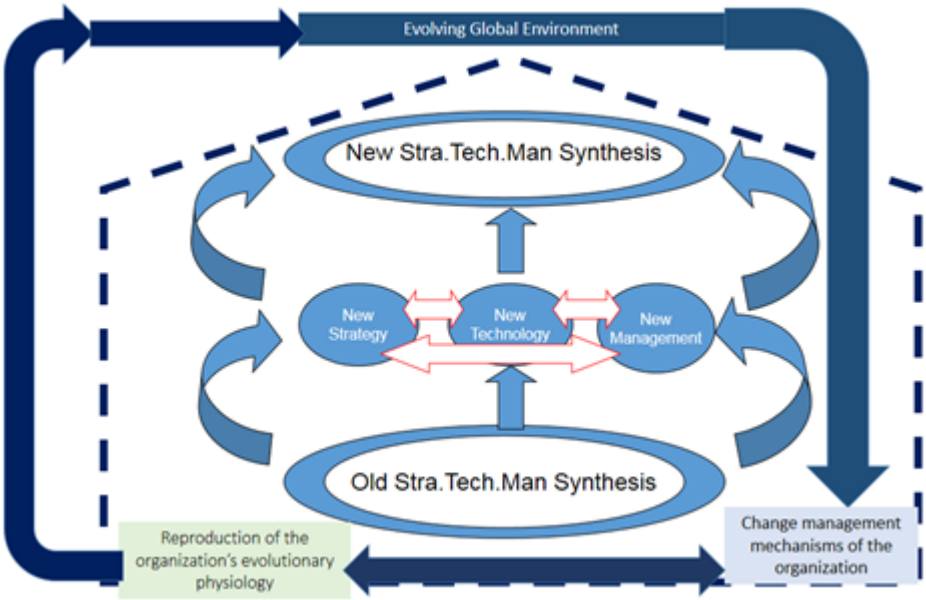


Figure 5. The fundamental Stra.Tech.Man "physiology" of the organization

This way, every firm/socio-economic organization synthesizes the Stra.Tech.Man triangle that its particular evolutionary "physiology" allows for—thus realizing, each time, its particular "business rationality." By doing so, it advances its heterogeneity, within a process that consolidates its internal efforts to adapt to changes in its external environment, while at the same time influencing and co-creating the same external environment (Figure 6).



Stra.Tech.Man terms

VI. In the end, the Stra.Tech.Man evolution of any organization is path-dependent, and for this reason, it is essential to understand its specific "physiological" history. The past decisions always determine the future decisions that any organization will take regarding its strategy, its technological choices, and its management actions.

The five steps of the Stra.Tech.Man approach in change management

The successful change management in terms of Stra.Tech.Man is a continuous dialectical synthesis (Langley & Sloan, 2011; Morabito, Sack, & Bhate, 2018; Norrie, 2009), in "living"/evolutionary terms. Namely, it is the constant birth of the evolutionary conflict between the thesis (status quo of operations) and the antithesis (forces to overthrow the previous regime), giving a new synthesis: In essence, that is, an overcoming of the previous antithesis scheme.

With this perspective, the modern manager of change must clear the main "normal" goals of change in terms of Stra.Tech.Man, before any action. Substantially, each organization must be able to perceive its particular "physiological" strengths and weaknesses based on the synthetic perspective Stra.Tech.Man, which opens up, respectively, the area of unique opportunities and threats.

In this analytical orientation, the most crucial elements of any organization, in terms of effective management of change may be found deep down in its "physiological nucleus" Stra.Tech.Man. That is, they are born and reproduced "within and by" its overall physiological dimensions: in its overall strategy, in its overall technology and overall management potentials, its innovative synthesis, and assimilation, in every instance (Figure 7).

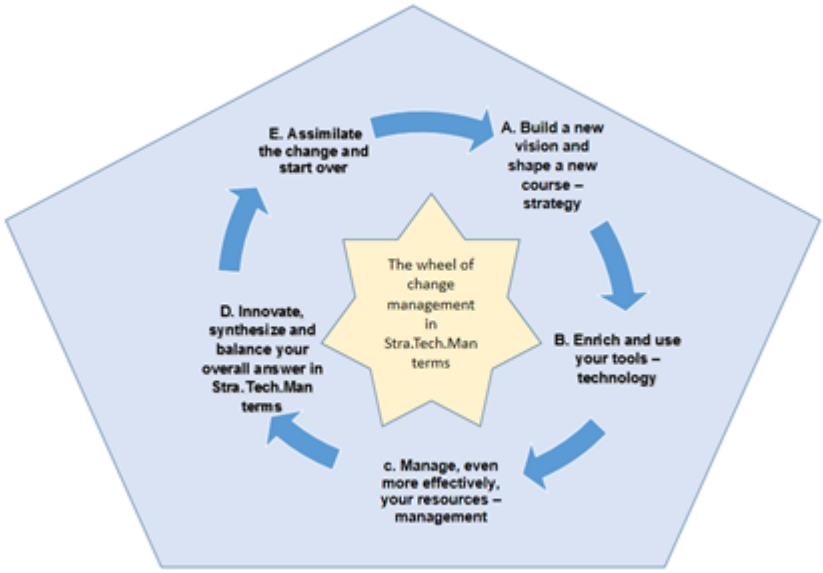


Figure 7. The five steps of managing change in the Stra.Tech.Man approach

Each step is broken down into eight points/questions/effects, defining a continuous process for the successful evolutionary activity of the organization, which must be perpetual and never stop.

A. The strategic evolution
1. Crystallize and deepen the vision and mission of the organization
2. Question the strategic certainties and warn in advance
3. Build mechanisms for a timely and comprehensive perception of the external environmental changes
4. Develop an understanding of the internal organizational environment
5. Build a comparative and evolutionary SWOT analysis
6. Build the alternatives carefully and evaluate them open-mindedly
7. Choose the strategy that suits better the organization, not only with ambition but also with realism
8. Analyze the organization's tactics and policies comprehensively

B. The technological evolution
1. Understand more deeply the technological nature of the organization
2. Get a full comparative image of the technological capabilities
3. Develop even more the mechanisms of technological alertness and collection of new technical data/information
4. Cultivate the internal potential of creating new technical capabilities

5. Stimulate the organizational processes for new technology diffusion within the organization
6. Strengthen the mechanisms of assimilating new technological data
7. Support in practice the complete implementation of new technology and the "experimentation."
8. Reward the successful implementation of new technology

C. The managerial evolution
1. Try new programming methods
2. Make the organization chart more flexible
3. Build a meritocratic way to place the right person in the right position, at the right time
4. Give the people of the organization the leaders who fit with them and can inspire them
5. Make the organization a "school."
6. Give extra motives, more "targeted" and specialized
7. Measure and evaluate with a fair enough and comparative spirit
8. Open new communication channels and build new ways of coordinating the action

D. The innovative synthesis
1. Crystallize the successful transformations in terms of strategy, technology, and management and prepare the new Stra.Tech.Man synthesis
2. Measure, balance, and adjust the innovative Stra.Tech.Man triangle accordingly
3. Spread the "revolution" or "innovation" message and build a dynamic group of guidance
4. Remove the obstacles, assign roles and encourage
5. Maintain the balance during the change's intervention
6. Try having "quick" wins and celebrate them in modesty
7. Define control and evaluation points of the overall effort
8. Finally, do not to forget to reward accordingly the people working at the project

E. The assimilation of change and the continuous change
1. Protect the actions that brought results and unify them into a cohesive logic: Cultivate and develop the "physiology" of the organization
2. Do not punish those that experimented honestly but failed, but those that proved faint-hearted
3. Refresh the hierarchy with new members
4. Make yesterday's success a goal to overcome and not a conservation monument
5. Tolerate the critique of outsiders in the organization
6. Build a business that "can be loved."
7. Chase down complacency and do not rest assured
8. Start over, always, from the beginning

All the previous steps must always be carried out with an open, evolutionary, and dialectical spirit. Otherwise, they cannot fertilize in depth the potential of change management within any organization. With the five-step Stra.Tech.Man approach to change management, there are deriving benefits distinguished on two levels:
- Socio-economic benefits. In today's world of crisis, and restructuring of globalization, the action of enterprises/socio-economic organizations is the most profound evolutionary engine. The innovation that all organizations articulate (or fail to articulate) is the most crucial link for the socio-economic systems on the planet to

emerge today from the painful phase of crisis and the restructuring of globalization: to innovate and build what many analysts today call the "new globalization" (Laudicina & Peterson, 2016; Vlados, Deniozos, & Chatzinikolaou, 2018).
- Business benefits. The five steps of change management in "StraTech.Man" terms, always packed and implemented in their evolutionary continuity, is a method of diagnosing and maintaining the innovation potential of each organization. The "evolutionary business physiology" in terms of Stra.Tech.Man is the starting point for every socio-economic organization to acquire in its "arsenal" a method of identifying how to create and enhance its innovation.

Conclusions and limitations

This article tried to introduce a new conceptual approach to change management. It acknowledged an undergoing transition in the organizational theory related to change management by examining the different schools of thought (individual approach, school of group dynamics, and open systems), which argue in favor of analyzing different behaviors among organizations. These approaches are at the root of the organizational analysis transition nowadays, which distances itself from the classical/mechanistic management towards a new, "organic" and "biological" perspective of management.

The Stra.Tech.Man approach to change management perceives the firm as a "living organism" that innovates according to its ability to synthesize its spheres of strategy, technology, and management. Innovation brings deriving changes and, therefore, the Stra.Tech.Man approach also extends in ways of handling and managing the changes. The five steps of the Stra.Tech.Man approach in change management refers to the successful strategic, technological, and managerial evolution, the innovative synthesis, and the assimilation of change and the continuous change.

The "Stra.Tech.Man" approach to change management provides some useful directions in the contemporary problem of managing the organizational change:
a) The concept of Stra.Tech.Man "physiology" of any firm/socio-economic organization provides clarity and sets the "normal limits" of evolution; therefore, any effort to manage change within each organization must first take into account the "living" nature in terms of both strategy, technology, and management.
b) Based on the comprehending that any firm/socio-economic organization is not a "machine" but instead a "living organism," we realize that it is never possible to change all at once, while time is never abundant in any attempt to change.
c) At the same time, it helps to realize that the Stra.Tech.Man innovative synthesis is a focal point of the overall process of managing change in each organization and, consequently, the analytical separation between the innovation dynamics of each organization and the management of change is profoundly inadequate and virtually irrelevant.
d) Moreover, towards this orientation, organizational culture is more of a "physiologically" evolving entity in every firm/socio-economic organization (in terms of both philosophy and procedures) than something superficially shaped and imposed.
e) The learning processes within firms/socio-economic organizations, through mixed combinations of explicit and tacit knowledge, are always subject to the limitations of the level of development of Stra.Tech.Man physiology of any organization.

f) At the same time, there is an inseparable evolutionary structuring of individual, group, and organizational dimensions in every attempt of change. The physiological co-adaptation of an organism as a whole with its parts always carries out any change.
g) Finally, with this approach, the resistance to change is not something exogenous but a natural expression of the internal organizational homeostasis of every organization (Joyce, 1982).

In conclusion, this approach is subject to limitations, which are related to the actual development of the Stra.Tech.Man analysis.

First of all, it does not yet have a fully operational form in terms of application, which can give complete practical usage in the field.
The analysis lack yet enrichment in terms of quantification in order to build a tool for "diagnosis" and "treatment" for change management problems within firms/socio-economic organizations.
Finally, there is not yet a sufficiently tested analysis on an interactive field (e.g., research action; Coghlan & Shani, 2017; Ranjan Kumar, 2013) so that it can be an established alternative change management model.

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