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PDF issue: 2026-11-15

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(Citation)
経営研究,53:1-16

(Issue Date)
2008-07-22

(Resource Type)
departmental bulletin paper

(Version)
Version of Record

(JaLCDOI)
https://doi.org/10.24546/80510006

(URL)
https://hdl.handle.net/20.500.14094/80510006

KOBE UNIVERSITY

ISSN 1347-5495

経営研究

Business Research

No. 53

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July 22, 2008

Graduate School of Business Administration,

Kobe University

Self-organization: A New Network Metaphor to Understand the Interdependences of the Organizations and Their Environments

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Abstract

Self-organization metaphors have recently emerged to enrich research on organizational environment in particular, with respect to the networking view that presents organizational environment as a complex web of interactions among groups of organizations. The network analysis promotes the group members' sensitivity to the variety in environmental demands. In an attempt to clarify how self-organization enhances the group's sensitivity, we propose the interdisciplinary autopoietic and habitus-field models. The proposed self-organization models allow portraying business organizations as networks of decision communications and integrated partners. Self-referential and self-reflexivity processes have been utilized by the models to guide a group of decision makers and the network partners as they respond swiftly to changes in environmental demands. We qualitatively examine the models' compatibility with open systems perspectives advocated by Scott (2003) in his multiple perspectives approach to organization theory. This is to demonstrate how self-organization models contribute to research on organizational environment. We conclude that self-referential and self-reflexivity processes add new insights to the responding mechanisms adopted by organization studies that share the same perspective with self-organization models.

Keywords: organizational environment; networking; self-organization; autopoietic; habitus-field

1 Introduction

In organizational terms, "organizational environment" refers to the groups of suppliers, partners, unions, competitors and customers that affect the behavior and outcomes of a focal organization (Blau & Scott, 1962). While organizations confront many different conditions and elements in their environments, the different environmental demands create pressure for a course of structural and behavioral modifications (Scott & Davis, 2007). The interdependences of the organizations and their environments have been a major research topic that attracts significant attention from various organization theorists (see for example: Hannan & Freeman, 1977; Aldrich, 1979; Pfeffer, 1978; and Cooper & Burrell, 1988). After decades of research, the mutual relationship between organizations and their environments is still poorly understood. This is in terms of the complex impacts of environmental changes on inter and intra-organizational interactions in addition to the dynamic mechanism that guides network partners and work groups in the process of adapting their behavior and structures to environmental changes. Major research on this arena has been drawn upon models that emphasize the direct causality between environmental changes and the desired structural modifications[1]. Here, an organizational structure exhibits no more variety than the variety to which a system has been exposed in its environment (Pondy & Mitroff, 1979). However, providing a model that describes how small change in organizational environment leads to circular processes of behavioral and structural modifications has not yet been conducted exclusively.

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The author would like to acknowledge his grateful thanks to Prof. Dr. Takuji Hara, Graduate School of Business Administration, KOBE University for his invaluable comments and guidance in making this paper possible.

[1] See Organizing model of Weick (1979); Population Ecological model of Hannan & Freeman (1977); Resource Dependence model of Pfeffer & Salancik (1978); and Institutional model of DiMaggo & Powell (1983).

In this context, systems theory traditionally provides various metaphors that improve our understanding of such a complex relationship between organizations and their environments in very different disciplines (Millett, 1998). Recent development of the interdisciplinary field has led to the discovery of many common features that are found among different disciplines' complex structures (Schweitzer, 1997). Natural science models thus play a valuable role in exploring and simulating the dynamic behavior of complex social science systems (Martin, 2003). From this standpoint, this paper develops new explanations about the complex relationship between organizations and their environments. This is through extending the biological and physical concepts of "self-organization" to human organization systems. We propose the autopoietic self-organization model that emphasizes interactions among organizational work groups at the intra-organizational level. The model reveals the processes that guide decision makers to produce course of decisions that help absorbing environmental uncertainty. At the inter-organizational level, the habitus-field self-organization model emphasizes interactions among a group of organizations. The model clarifies the processes that describe the mechanism by which network partners integrate their activities to respond swiftly to the widest collection of consumers' demands.

We adopt the multiple perspectives approach of Scott (2003) that classifies organization studies into distinctive systems perspectives according to the degree of organizational complexity. Basic assumptions of each perspective have been used as criteria to place the self-organization models into their proper systems perspectives. This is to clarify how self-organization models add new insights to organizational studies that share the same perspective with them. Here we classify organizational research into a number of systems perspectives emphasizing basic assumptions of each perspective. Some conceptual issues associated with designing self-organization models is then addressed for organizational complex systems. The term "organizational complexity" here refers to the number and diversity of the elements of organizational environment in addition to how rapidly these elements change (Duncan, 1972). Emphasis is given here to examine the compatibility of self-organization models with open systems perspectives. This is to demonstrate the models' contributions to research on organizational environments.

2 Multiple Perspectives Approach to Organization Theory

The multiple perspectives approach to organization theory has been explored by a variety of organization theorists to classify theories about organizations using various classification schemas (Burrell & Morgan, 1979; Hassard, 1991; Pfeffer, 1982; and Martin, 1992). Among organization theorists, Scott (2003) has been particularly active in promoting the multiple perspectives approach to justify the diversity of organization theory by pointing out the complexity of organization (Hatch, 1997). He uses organizational complexity as a schema to classify studies concerning organizations as either closed or open systems perspectives.

2.1 Closed Systems Perspectives

Organization studies drawn upon the closed systems perspectives focus primarily on the internal characteristics of organizations. It ignores the events and processes that exist external to organizations and affect their structure and behavior. Two main closed systems perspectives here have been identified namely closed-rational and closed-natural perspectives.

The closed-rational systems perspective portrays organizations as tools designed to achieve preset ends with maximum efficiency (Mannheim, 1950). It focuses on formal structure as a significant tool for the efficient achievement of specific organizational goals. Goals are specific when they provide explicit criteria for selecting among alternatives. On the other hand, structures are formalized when the rules governing behavior are precisely formalized. The social cement that binds and regulates interactions among formal groups is called the normative (regulatory) structure (Scott & Davis, 2007). The normative structure includes values, norms, and role expectations. While values are the criteria of selecting the behavior goals, norms are the generalized rules governing the behavior for pursuing selected goals, and roles are specific positions as a location in a system of social relationships. In organizations, values, rules and roles are organized to constitute a relatively coherent and consistent set of prescriptions governing the behavior of participants (Davis, 1949).

On the other hand, the closed-natural systems perspective places more emphasis on informal structures and goal complexity. It distinguishes the stated goals from the real goals. Though the stated goals are actually being pursued, they are never the only goal governing participants' behavior. The closed-natural systems theorists argued the existence and importance of the informal structures based on personal characteristics and real goals of specific participants rather than their given position within the formal structure. The social cement that binds and regulates interactions among informal groups is known as the behavioral (cognitive) social structure. Homans's (1950) well-known classification of social behavior into activities, interactions, and sentiments suggests elements of organizations' behavioral structure.

2.2 Open Systems Perspectives

Open systems theorists posit that organizations are affected by a number of factors that dominate their environment and that they can have an effect on their internal structure (Burnes 1996). When open system perspectives developed later than the closed perspectives, they have profoundly altered our conception of organizations and their central features (Scott & Davis, 2007). However, an ascendance of open-systems view has not meant the disappearance of the earlier closed-rational or natural systems views. Instead of that, they have been updated through combining them with the open-systems in multiple ways. From this line of reasoning, the open-rational and open-natural systems perspectives have been introduced.

Since the early 1960s to the present, a new generation of research which incorporates organization as a rational system has gained attention, but from an open system perspective. Open–rational systems theorists treat organizations as open systems. At the same time, however, they assumed that organizations are striving to develop effective and efficient formal structures, embracing basic assumptions of the closed-rational system perspective. Organizations thus cope with changes in their environment employing formal values, rules and roles as the elements that construct their normative structures. In this context, Burrell & Morgan (1979) argued that organizations are primarily responding organisms that function in an exchange relationship with their environment. From this standpoint, Hernes & Bakken (2003) introduce the equilibrium-based model that stresses open–rational systems characteristics. Organization studies that have drawn upon equilibrium-based model stress the functions that formal work groups should perform to adapt their behavior and structure to environmental changes (Hernes & Bakken, 2003).

In the late 1970s, open-rational models that have dominated organizational research for about ten years are being challenged by wide variety of models stressing the open but natural character of organizations. Open-rational models have not been replaced but they are being joined by a profusion of open-natural models. Weick (1979) introduces the process-based model that stresses elements of the behavioral structure rather than elements of the normative structure. An organization is viewed as an entity that is made up of a process of actions rather than a structure of combined units. Form this view, an organization is considered as an evolving cognitive processes by which a set of interlocked (repetitive, reciprocal and contingent) behavior develop between two or more actors (Weick, 1979). The term "process", here, refers to the stages of the sense making that consist of the activities of enacting, selection and retention. Enactment refers to active roles played by organization participants in defining the environment they confront. In the stage of selection, participants employ rules and communication that help them to cope with the perceived variety of their environment. While rules allow responding to standardized circumstances, communications involve cycles of exchanging information led to interpretations needed to respond to the perceived demand. In the stage of retention, such responses can be repeated if similar situation occur. In this manner, novel activities become routinized and retained.

In conclusion, the multiple perspectives approach advocated by Scott (2003) reveals that studies concerning organizations vary in their dominant systems perspectives. While closed-rational theorists presents organizations as collectivities oriented to the pursuit of relatively specific goals by exhibiting relatively highly formalized structures, the closed-natural theorists assert that organizations are collectivities whose participants share a common interest and engage in collective activities informally structured to secure system's survival. On the other hand, open-rational theorists see organizations as rational systems that are adapted to their external

environment employing elements of the normative (regularity) structure represented in formal rules, values and roles. Otherwise, open-natural theorists argue priority of the behavioral (cognitive) structure elements represented in individuals' sentiments and actual interactions to respond to environmental demands.

When the intention of this paper is to examine self-organization models and their contribution to the research on organizational environment, the preceding section represents the base for establishing the next section that spotlights different patterns of self-organizing behavior in business organizations.

3 The New Metaphorical Concept of Self-organization

This section portrays a framework that assists a group of decision makers and network partners to adapt their behavior and structures swiftly to changes in environmental demands. In order to build such a framework, self-organization concepts in various disciplines first should be distinguished. This is through describing the self-organizing behavior in physiological, biological, psychological and social networks. Then, the self-organization biological and physiological concepts are extended to the field of business organizations. This is through proposing the interdisciplinary "autopoietic" and "habitus-field" models that describe the self-organizing behavior in business organizations. We finally examine the compatibility of the proposed self-organization models with systems perspectives indicated in the previous section. This is to clarify how autopoietic and habitus-field self-organization models contribute to the existing organizational research that adopts these perspectives.

3.1 What is Self-organization?

Self-organizing systems have been defined as systems that are continuously evolving and adjusting themselves to the various demands of the environment (Ashby, 1968). The idea of self-organization had been first introduced by those associated with general systems theory especially after the emergence of the complexity theory in the 1970s and 1980s (Stacey, 1996). Since that time, self-organization concept has been a subject of discussions concerning the question of the interrelationship between a system and its environment in various disciplines (Schillo et al., 2002). This is to explain systems' behavior as they respond to changes in their environments either in simple physiological and biological systems or in complex psychological and social systems (see figure 1). Self organizing behaviours thus had been first discovered in the nature science domain, both in the world of non-living systems such as galaxies, rivers and stars, as well as in the world of living systems such as cells, animals, birds, plants and insects groups. They are found also in human-made systems such as societies and human organizations, as well as in the world of ideas like world views, scientific believes and norms systems (Swarnasrikrishnan and Nagabrahmam, 2005).

While self-organization behavior is found in different disciplines, the physical, biological and sociological concepts of self-organization take on different meanings. The most unambiguous examples of self organizing systems are drawn from physics where the concept was first noted. Here, the term "self-organization" has often been taken as being synonymous with other terminologies such self-regulation, self-control and self configuration. In this sense, self-organization refers to systems that actively control the course of interactions with some external variables by regulating the arrangement of their constituent parts (Martin, 2003). The concept of self-organization is also central to the description of biological systems, where it has often been taken as being identical with terms as self-maintenance, self-awareness and self-production. Here, self-organization refers to the system that actively preserves its form and functional status over time by generating itself or producing other systems (Whittaker, 1995).

Self-organizing behaviour of the living organisms suggests that the notion of self-organization should be expected in the human organization systems (Weidlich, 1991). Self-organization in sociology describes the behavior of social entities such as groups, networks and organizations (Schillo, 2002). In the field of organizational research, there is now widespread interest in applying the concepts of self-organization to analyze organization groups as purposeful social collectives. In this context, self organization refers to "the process of generating, adapting and changing organizational structure and behavior, which are the result of

individual choices by a set of partners (agents) to engage in interaction in certain organizational patterns" (Schillo et al., 2000, p. 3).

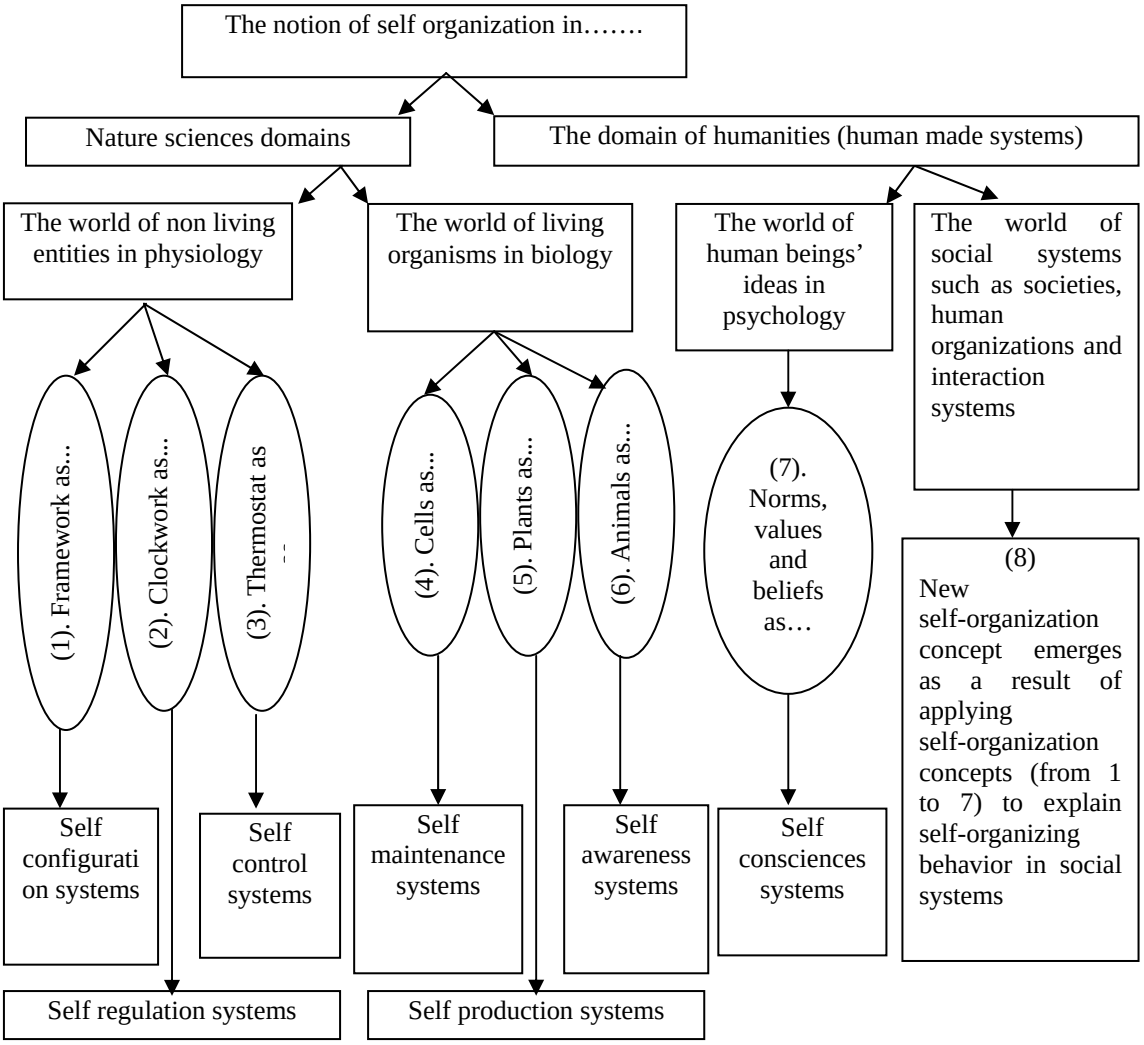


Figure 1: The interdisciplinary concepts of self-organization.

In recent years, the self-organization notion has emerged to add new insight to the mutual relationship between organizations and their environments. In this context, open systems theorists assert that organizations cope with changes in their environments employing either their normative (regulatory) or behavioral (cognitive) structures (Scott, 2003). While open-rational theorists stress elements of the normative structure by focusing on formal rules and roles, open-natural theorists argue priority of the behavioral structure that gives attention to the work groups' sentiments and actual interactions (Scott & Davis, 2007). In both perspectives, the law of requisite - limited variety governs the interdependences of the organizations and their environments (Hatch, 1997). In the requisite - limited variety, an organization should accurately match the variety of its environment with its internal structure. However, a system exhibits no more variety than the variety to which it has been exposed in its environment (Pondy & Mitroff, 1979). Here, the notion of dynamic linearity describes the direct causality between changes in organizational environment and the desired modifications in organizational behavior and structure. Organizations thus produce limited modifications responding to particular changes in their environments (Millett, 1998). Such an assumed direct causality failed to explain the complex impacts of environmental changes on organizational behavior and structure. This is in terms of how small change in organizational environment leads to circular processes of unlimited behavioral and structural modifications.

The dynamic non-linearity is considered a recent development in systems theory (Stacey, 1996). In

non-linear systems, small change in any of the elements constructing organizational environment leads to large influences on organizational behavior and structure (Stacey, 1993). From this point of view, organizations are neither simply mechanistic nor organic systems, but they are so complex that minute environmental changes cause complex and unpredictable behavioral and structural responses (Smither, Houston and McIntire, 1996). Such a new view stimulates different way of looking at organizational change. It shifts attention away from planned change to the messy processes of self-organization that produce and reproduce unpredictable emergent modifications (Shaw 1997). To provide a clear view of these processes, we portray business organizations as self-organizing systems utilizing basic assumptions of the autopoietic and habitus-field social models. The next section sheds light on these self-organization models emphasizing how they provide a framework that assists a group of decision makers and network partners to respond swiftly to changes in environmental demands.

3.2 Self-organization Models

In Boulding's typology of systems hierarchy, theories of the lower systems domains are applied to explain phenomena that occur in the higher systems domains (Boulding, 1956). Boulding classifies systems into a number of levels. Levels 1 to 3 encompass physical systems domain while levels 4 to 6 include biological systems domain. Moreover, levels 7 and 8 imply social systems domain (refer to figure 1). Accordingly, the self-organization behavior of physical and biological systems can be extended to the social organization systems (Weidlich, 1991). Building on this, the following sections emphasize the self-organization models of autopoietic and habitus-field that originated from biological and physical systems.

3.2.1 Autopoietic Self-organization Model

Referring to Boulding's (1956) hierarchy of systems complexity, autopoietic social model has emerged when self-organizing behavior of the living organisms, in the plant (genetic) systems level, has been adopted to explain individuals' behavior in social organization systems level (Hatch, 1997). In plant or genetic systems, the biological concept of self-organizations refers to the process by which living organisms can produce and reproduce their own components to survive and evolve. Systems theorists, therefore, consider autopoiesis to be a more specific form of self-organization, referring to system with capacity to stimulate its external environment by producing and organizing its components (Whittaker, 1995).

To extend the autopoiesis to the field of business organizations, we have to clarify how the idea is transferred from its biological roots to societal domain and afterwards to the field of business organizations. From the very beginning, the concept of autopoiesis ('auto' meaning 'self' and 'poiesis' meaning 'production') was originally developed in the field of neuron-biology by the Chilean neuroscientists Humberto Maturana and Francisco Varela. From a purely natural science point of view, Maturana and Varela's point of departure was to understand better the elementary processes that enable living organism to maintain its continuation through reproducing its elements whether by the synthesis of organic molecules in a cell or the generation of impulses in a neuronal network (Maturana & Varela 1992).

In 1986, sociologist Niklas Luhmann abstracted the theory of autopoiesis from its biological roots to concrete a distinctive model of social systems. As the same way as molecules produce other molecules in a circular process, autopoietic model portrays social organization as a system of communications that produce other communication. While communication consists of information, utterance and understanding, information refers to what is being communicated; utterance refers to how and why something is being said. For communication to be understood, what is being communicated must be distinguished from how and why it is communicated (Sidle, 2004). In social interaction, the process of communication describes how senders and receivers mutually exchange (produce and reproduce) utterances in the form of physical tokens. Sender of an utterance selects one or more topics (information) to be communicated with other individual/s (receivers). Senders then choose the proper words to express their ideas. For receivers to understand meaning of the sender message, they have to analyze the received utterance. This is by simplifying it to its words and realizing the reason of using these words by the sender. The receiver then has to produce other utterances to reply the sender message according to the perceived information and so on (Luhmann, 2003).

The autopoietic social model represents considerable potential for understanding business organizations as living systems (Hatch, 1997). In an attempt to develop a model that portrays business organizations as autopoietic system, we adapt basic assumptions of the autopoietic social model. The emerged self-organization model views business organization as network of decision communications. To describe the dynamic mechanism by which decisions are produced in circular manner within the model, we propose the self-referential process (see figure 2).

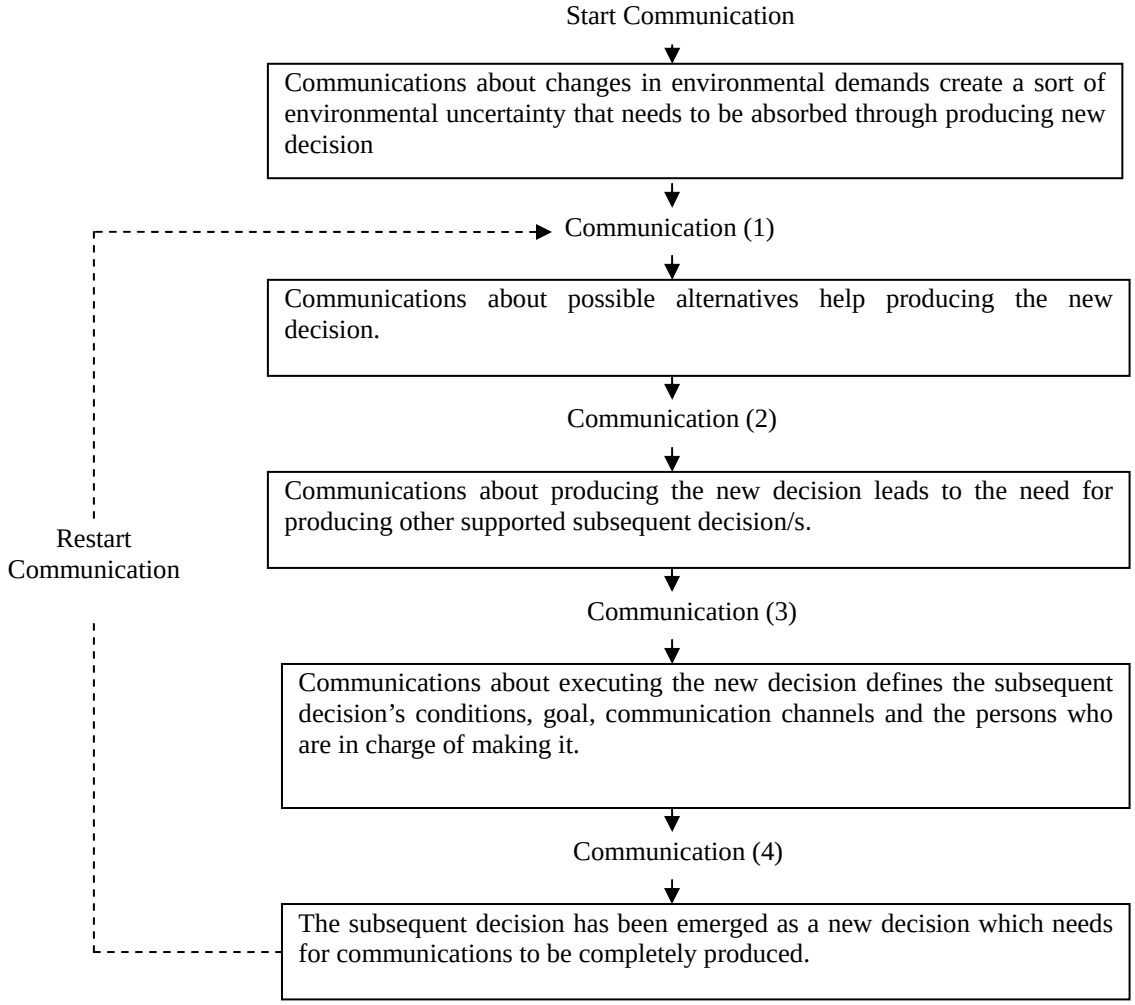


Figure 2: Self-referential process.

The process illustrates how earlier decisions work as references that guide decision makers to produce the later decisions. In other words, every decision is the output of the previous decisions, at the same time, it helps producing the following decisions to reduce environment uncertainty in the form of further decisions. Changes in the consumer needs entail reducing the uncertainty concerning two alternatives (e.g. establishing new production line to increase the company products mix or modifying existing production lines to enhance the present products collection). To produce a suitable decision, alternatives are negotiated with production departments' managers. This is through exchanging utterances between the top management and production managers in different departments (e.g. manufacturing, production lines and R&D managers). Then, production managers' decision should be discussed in wide committee with other departments' managers who support executing such decision (e.g. marketing managers to market the new product). Therefore, producing decision about the new products generates new uncertainty concerning the marketing of such products. As in the previous stage, possible alternatives to market the new products are negotiated with marketing managers. This is to produce the marketing decision that is discussed with other departments' managers who support executing such decision (e.g. financing managers to finance the marketing campaign). However, production managers'

decision dominates structural prerequisites that define decision situation of marketing managers. This is in terms of its condition, goal, communication channels and persons who are in charge of making the decision. Producing decision about marketing the new products generates new uncertainty concerning the different ways of financing the marketing campaign which are absorbed as same as in the previous two decisions to produce other sort of uncertainty and so on.

Accordingly, basic assumptions of the autopoietic social model have been adapted to portray business organization as a machine for producing decisions. The new self-organization model views organizational structure as network of decision communication. Decision makers at different departments exchange utterances about possible alternatives to produce and reproduce decisions that help responding to particular environmental demands. While the reduction of uncertainty is not a process that leads to a final solution, there are always new uncertainties that have to be absorbed by new decisions (Luhmann, 2003). So, small changes in elements of organizational environment may lead to wide modifications in organizational behavior and structure.

3.2.2 Habitus-field Self-organization Model

Given Boulding's typology, the habitus-field social model has emerged when the notion of self organization, in the thermostat systems level, has been utilized to dominate individuals and groups behavior in social organization systems level (Hatch, 1997). In thermostat systems, the physical concept of self organization refers to the process by which the system actively controls the course of interactions with some external variables by regulating the arrangement of its constituent parts (Scott & Davis, 2007). In this context, systems theorists argue that the best analogy of intellectually rigorous the habitus-field model would be the classical electromagnetism (Martin, 2003). The magnetic field encompasses forces that are neither identical nor randomly distributed. Such organized forces induce motions in a charged particle existed within the magnetic field. Interactions between the field and the particle explain changing the particle states by considering that each particle has particular attributes that make it susceptible to the field effect (particles differ in the degree and direction of charge). In electromagnetism model, interactions between charged particles in particular characteristics and forces created within the magnetic field dominate motion of the charged particles in particular directions.

Physical model that explains dynamic mechanism of the charged particles had been exploited to dominate individuals and groups' social practices through the habitus-field model (Bourdieu, 2003). To understand this model, we need to define briefly the meaning of "field", "habitus" and "capital". Social field is a network of objective relations between positions occupied by agents. It provides a structure that describes agents positions and the setting in which interactions occur. Fields are distinguished by the fact that they each have their own capital that takes on different forms of power. While economic capital takes the form of ownership, the cultural capital appears in the form of knowledge. In addition, social capital takes the form of networks and contacts based on mutual recognition. Each position within the field is occupied by particular agent who posses a particular forms of power (capital). From this perspective, agents are arranged in layers according to the volume and the composition of the capital they possess to construct the structure of the social field (Bourdieu, 1992). The term habit or habitus refers to the system of transposable dispositions including the individuals' past experiences, beliefs and attitudes that are acquired from the field and generate individuals' perceptions and consequently their practices. The relation among field, habitus, capital and practice is summarized as the equation: (Habitus x Capital) + Field = Practice. Thus, agents' habitus and possessed capital within the field define the possibilities and style of agents' behavior (Bourdieu, 2003).

Although Bourdieu himself didn't work on organization theory, his social model of habitus-field represents considerable potential for understanding organizations as "corporate agents" and "autonomous social field" (Schillo, et al., 2000; Schillo, 2002). Building upon this, we portray business organizations as habitus-field systems using basic assumptions of the habitus-field social model. We propose organizational environment to be a "macro" organizational field that includes groups of corporate agents who occupy certain positions (suppliers, partners, unions, competitors or customers). Each group is considered as a micro organizational field whose agents cooperate with each others responding to changes in the requirements of other macro field's corporate agents who affect outcomes of a focal group. According to the volume and the

composition of the power they possess, the group of corporate agents is arranged in layers within the micro organizational field. Rules and roles relations that dominate interactions among multilayered corporate agents are well defined by the micro field structure. Each agent within the micro field thus becomes in charge of performing particular functions. Agents use their dispositions to determine activities that have to be achieved to accomplish such functions.

Emphasizing business network partners, as one of the macro field's group, we draw an example from a group of high-technological small manufacturers working in related industrial field with different but complementary capabilities. These small manufacturers as subcontractors integrate their competences to satisfy the needs of contracting enterprises. As corporate agents, small subcontractors and contractors occupy certain positions (suppliers and consumers) within the macro organizational field. Each occupied position within the macro field possesses particular form/s of capital (power). While small suppliers possess different yet integrated cultural capital (know-how and knowledge), consumers possess economic capital (ownership) and social capital (recognition and reputation). According to the volume and the composition of the capital they possess, suppliers are arranged within the micro organizational field. Rules and roles relations that dominate interactions among small suppliers are precisely defined by the micro field structure. According to their defined role, small suppliers use their dispositions to determine the desired activities that are needed to accomplish consumers' orders.

We propose the self-reflexivity process to describe the dynamic mechanism by which small subcontractors can integrate their activities to provide wide range of contractors' orders. The term "reflexivity" here refers to the circular process by which agent's activities affect activities that are done by other agents within the field (Bourdieu, 1992). Each corporate agent according to their position within the micro field (business network) is in charge of performing a number of functions (see figure 3).

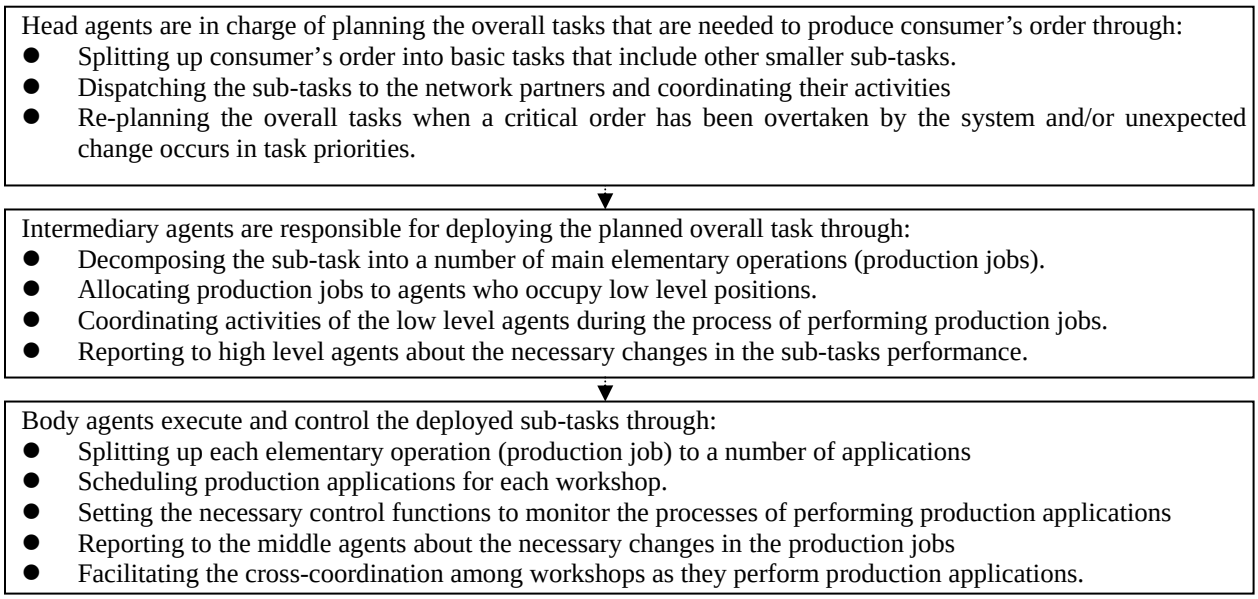


Figure 3: Self-reflexivity process

At the inter-organizational level, supply agents who occupy high level positions work as head agents to represent the system to the outside systems. They are responsible for planning the overall tasks that are needed to perform consumers' orders and splitting up these tasks into a number of sub-tasks. They are also responsible for dispatching the sub-tasks to the supply network. Moreover, high level supply agents are responsible for coordinating activities of the network partners and re-planning the overall tasks when a critical order has been overtaken by the system and/or unexpected change occurs in task priorities.

At the intra-organizational level, suppliers within the field structure work as intermediary agents. They are responsible for decomposing each sub-task into a number of main elementary operations (production

jobs). They allocate production jobs to their organizational work groups and coordinate their activities during the process of performing production jobs. They are also responsible for reporting to high level agents about the necessary changes in the sub-tasks performance. At the workshop level, supply agents who occupy low level positions within the field structure work as body agent. They are responsible for scheduling the process of executing and controlling the elementary operations (production jobs). They split up each elementary operation (production job) to number of applications and schedule production applications for each workshop. Furthermore, they are responsible for setting the necessary control functions needed to monitor the processes of performing production applications; reporting to the representative intermediary agents about the necessary changes in the production jobs and facilitating the cross-coordination among workshops as they perform production applications.

Accordingly, basic assumptions of the habitus-field model have been adapted to portray business organizations as habitus-field. The new self-organization model views business network as autonomous social field and corporate agent. According to their position within the field, network partners as corporate agent are responsible for accomplishing well defined functions. The self-reflexivity process describes the dynamic mechanism that helps network partners to integrate their competences to provide a widest collection of consumers' orders.

So far we have portrayed business organizations as self-organizing systems by adopting basic assumptions of the autopoietic and habitus-field social models. The new self-organization models use the dynamic mechanisms that are described in the self-referential and self-reflexivity processes. This is to provide framework that guide decision makers and network partners to respond swiftly to changes in environmental demands. In order to demonstrate the models' contributions to research on organizational environments, next section examines compatibility of the self-organization models with open systems perspectives indicated in section 1 of the present paper.

3.3 Compatibility of Self-organization Models With Open Systems Perspectives

In order to examine compatibility of the self-organization models with open systems perspectives, we need to compare the autopoietic and habitus-fields' view of business organizations with open-rational and open-natural systems perspectives.

3.3.1 Compatibility of Autopoietic Model With Open Systems Perspectives

The autopoietic view of organizations distinguishes itself markedly from the open-rational perspective (Hernes & Bakken, 2003). Open-rational models present organizations as rational systems that cope with their external environment employing elements of the normative structure represented in formal rules, values and roles (Scott & Davis, 2007). They presume that environmental demands and organizational response are mediated by decision makers who develop adequate arrangements to cope with environmental changes. Here, open-rational theorists emphasize the cognitive limitations of the decision makers and the role of goal specification and structure formalization to support their rational respond to environmental demand[2]. On the contrary, autopoietic organizational model locates decisions rationality at another point of the decision making process (Nassehi, 2005). The model emphasizes that the notion of choice in decision making process doesn't explain anything. If there was any secure knowledge about how to decide, we don't need criteria for choosing among alternatives (Luhmann 2003). Through the self-referential processes, decisions develop premises that absorb uncertainty. These premises provide a secure knowledge that enables decision rationality. As in the example of producing new products, production managers exchange information about possible alternatives of producing new products. Exchanging information generates knowledge that enables production managers to make rational decision. At the same time, production managers' decision provides marketing managers with knowledge that secure the decision of marketing the new products. This is by defining the structural prerequisites that clarify

[2] See the concepts of bounded rationality (Simon, 1997; March and Olsen, 1976), and non-transparent local rationalities (Cyert and March, 1963).

situation of the marketing decision in terms of its condition, goal, communication channels and persons who are in charge of making this decision.

To generate the knowledge that is needed to secure producing rational decisions, alternatives should be negotiated among decision making managers in a series of decision communications. Through the communication processes, managers exchange utterances in the form of physical tokens. Receivers of utterances employ the sense making (cognitive) processes to perceive meaning of the senders' utterances (Hernes & Bakken, 2003). From this standpoint, autopoietic organizational model is compatible with open-natural perspective that presents an organization as an entity made up of a process of cognitive actions by which a set of interlocked (repetitive, reciprocal and contingent) behaviors are developed between two or more actors (Weick, 1979). Although autopoietic organizational model shares the appreciation of process with the open-natural models, there are considerable differences between two views. Organizational research drawn upon open-natural perspective stresses role of the behavioral structure elements, represented in decision makers' sentiments and actual activities, to cope with environmental demands (Scott & Davis, 2007). In open-natural models, individual participants use the sense making processes to perceive changes in the surrounded organizational environment and produce the suitable course of activities that is needed to cope with environmental demands. Here, the notion of dynamic linearity describes the direct causality between changes in organizational environment and the desired modifications in organizational behavior by which determined changes in work groups' behavior reflect particular changes in the environment (Millett, 1998). For example, changes in the consumer needs lead to particular modifications in the work groups activities in production departments.

On the contrary, we adopt basic assumptions of the autopoietic model to portray an organization as a network of interconnected decisions communications that links organization levels with each others to form organizational structure. Using the self-referential processes, we offer new insights to the mechanism by which both processes and activities can be mutually interact to respond to environmental continuous changes. Here, the notion of dynamic non-linearity describes complex relationship between changes in organizational environment and the desired behavioral and structural modifications. Small changes in any of the elements constructing organization environment lead to chain of organizational modifications (Stacey, 1993). In our illustrative example, changes in consumer needs require modifying not only activities of the production departments but also in activities of other organization departments such as the marketing and financing departments. This is to market the new product and to finance the marketing campaign.

3.3.2 Compatibility of Habitus-field Model With Open Systems Perspectives

The habitus-field view of organizations distinguishes itself from the open-natural perspective. Open-natural models stress role of the participants' sentiments in perceiving changes in environmental demands to produce the suitable course of activities that are needed to cope with these environmental changes (Scott & Davis, 2007). From this view, open-natural theorists see agents' dispositions (such as participants' beliefs, attitudes and past experiences) as a source of organizational real goals that have been distinguished from organizational stated (formal) goals. Participants' dispositions thus help constructing organizations informal structures that are dominated by personal characteristics and real goals of specific participants rather than their given position within the formal structure. On the contrary, habitus-field model stresses that agents' dispositions are a product of organizational field that they take part in (Inglis, 2003). While agents' dispositions generate their perceptions and consequently their practices, field structure's rules dominate agents' dispositions by which each agent within the field is in charge of performing preciously defined functions (Mouzelis, 2007).

Such a mechanistic, deterministic, over systemic and functionalist view of organizations make habitus-field model compatible with open-rational perspective. Open-rational models stress the functions that formal work groups should perform to adapt their behavior and structure to environmental changes (Hernes and Bakken, 2003). Although habitus-field model shares the appreciation of goal specialization and structure formalization with the open-rational models, there are considerable differences between two views. Open-rational theorists see organizations as rational systems that cope with their external environment

employing elements of the normative structure represented in formal rules, values and roles (Scott and Davis, 2007). Organizational research drawn upon open-rational perspective adopts the notion of dynamic linearity emphasizing the direct causality between changes in organizational environment and the desired structural modifications. Here, particular changes in elements of organizational environment cause determined modifications in organizational formal structure (Millett, 1998).

On the contrary, we adopt basic assumptions of the habitus-field model to portray business network as a group of corporate agents occupying certain positions and practicing well defined functions within an autonomous organizational field. Using the self-reflexivity processes, we offer new insights to the mechanism by which agents activities are integrated to respond to a widest collection of consumers' demands. Here, the notion of dynamic non-linearity describes complex relationship between changes in organizational environment and the desired structural modifications. Thus, small changes in environmental demands lead to wide modifications in agents' activities. In our illustrative example, changes in the consumer's orders require modifying supply agents' functions at all stages (high, middle and low level positions) within the field.

4 Conclusion

In an attempt to portray business organizations as self-organizing networks, basic assumptions of the autopoietic and habitus-field social models have been utilized. The emerged autopoietic and habitus-field self-organization models add new insight to research on organizational environment. In order to demonstrate how these models contribute to research on organizational environments, we examined the models' compatibility with systems perspectives advocated by Scott (2003) in his multiple perspectives approach to organization theory. We argued compatibility of the proposed self-organization models with open-rational and open-natural systems perspectives. Self-organization models however explore the complex impacts of environmental changes on organizational behavior and structure emphasizing the dynamic mechanism that guides organizations in the process of executing the desired behavioral and structural modifications. In the empirical domain, self-organization models provide a framework that assists decision making groups and network partners to respond swiftly to changes in environmental demands.

Accordingly, two conclusions can be drawn from this paper. While the autopoietic social model stimulates molecules interactions to view social organizations as living systems, we adapt the model's basic assumptions to develop the autopoietic self-organization model. The emerged model portrays business organization as a network of decision communications. Here, self-referential processes describe the dynamic mechanism by which decisions are communicated among organizational work groups in circular manner to reduce environment uncertainty in the form of generating chain of decisions. To demonstrate the model's contribution to research on organizational environment, we examined its compatibility with open systems perspectives. We argued that autopoietic self-organization model shares the appreciation of cognition process with open-natural systems perspective. The autopoietic model however adds new insight to the mechanism used by open-natural models to respond to environmental changes. In open-natural models, an organization exhibits no more variety than the variety to which it has been exposed in its environment. The new self-organization model proposes self-referential processes to clarify the dynamic mechanism by which decision communications are produced in circular manner to link organizational parties with each others. Such a network of decision communications provide managers at different organizational units with a secure knowledge that help modifying the units' activities responding to changes in environmental demands. So, small changes in elements of organizational environment lead to wide modifications in organizational units' activities.

On the other hand, the habitus-field social model stimulates movement of the charged particles within the magnetic field to dominate individual and groups practices within the social field. Building upon this, the model's basic assumptions have been adapted to develop the habitus-field self-organization model. The new self-organization model proposes business organizations as a network of corporate agents and autonomous field. Here, the processes of self-reflexivity describe the mechanism by which a group of corporate agents integrate their competences to respond to changes in environmental demands. To

demonstrate the model's contribution to research on organizational environment, we examined its compatibility with open systems perspectives. We argued that habitus-field self-organization model shares the appreciation of goal specification and structure formalization with the open-rational systems perspective. The habitus-field model however adds new insight to the mechanism by which open-rational models respond to environmental demands. In open-rational models, particular changes in elements of organizational environment cause limited modifications in organizational formal structure. On the contrary, habitus-field model claims that changes in any of the elements constituting organizational environment lead to wide modifications in functions performed by the group of corporate agents. The model provides a framework by which each corporate agent according to their position within the field is in charge of performing a number of well defined interdependent functions. So, small changes in elements of organizational environment lead to wide modifications in corporate agents' functions.

Interdisciplinary is still a fundamental field of our means of organizational analysis. There is no suggestion that general systems theory be abandoned as a conceptual framework for making sense of our actions. However, there is no denying that the emerging self-organization models provide a new era for moving us forward if we are prepared to embrace what autopoietic and habitus-field might offer to managers and leaders for making sense of a future that is unknowable.

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