JAPANESE CREATIVITY IN BUSINESS AND MANAGEMENT

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INTRODUCTION

Sustainable development is possible only when our economic and social systems are based on renewable resources. We cannot continue to rely on the use of non-renewable resources if we are serious about promoting the goal of sustainable development.

Renewable resources may be divided into two groups. A plant and an animal population with the capacity for reproduction and growth represent the first group, while an inanimate mass and an energy source subject to constant or periodic flux the second. I would like to include human labor and creativity as renewable resources of the first group. I believe that creativity plays a crucial role in promoting sustainable development.

ETHNOGRAPHY OF ORGANIZATIONS

I want to characterize Japanese creativity in business and management based on the ethnographic studies of organizations.

Recent ethnographic studies of organizations indicate that significant amounts of learning and innovation take place in the informal communities-of-practice in which people work (Brown & Duguid, 1991). In other words, creativity emerges in the context of a unified environment of work, learning, and innovation.

Ethnographic studies also indicate that the modern workplace requires improvisational skills, whereas directed communication plays only a supplementary role. Improvisational skills grow from the practice of creating and exchanging of stories (Orr, 1990). Indeed, story-telling has two important aspects: first, telling stories helps to diagnose the complex situation of the workplace; and second, stories act as repositories of accumulated wisdom. Story-telling becomes possible through collaboration in the informal communities-of-practice.

We can say that ethnographic studies have clarified the informal side of organizations. In fact, the "informal" aspect is shown to be more important than the "formal" aspect in organizational work. This can be summarized by the three factors shown in Table 1.

Table 1. *Three Factors of the Informal Communities-of-Practice*

A. Narration (situated, improvisational)

B. Collaboration (emergent, relational)

C. Social Construction (shared understanding and interpretation)

TRADITIONAL GROUPWARE IN JAPAN

The Japanese workplace exploits various tools to integrate work, learning, and innovation. These tools are classified into three types based on the three factors which foster improvisational skills.

A. Tools of Story-Telling: Quality control (QC) and total quality control (TQC) circles serve as the main sites of story-telling and the informal communities for work, learning, and innovation. In these circles, the relationship among members is lateral, even though the formal relationship is vertical. A member of the informal circle is free to exchange stories with other members. Indeed, freedom is crucial for a member if he/she is to play a role in improvisational dramas and to adapt to a new situation in the workplace.

B. Tools of Collaboration: The Japanese workplace looks like a big common room as the workers share the common workplace *(ohbeyasei)*. They can exchange information and ideas with the members of different sectors (e. g., the R & D section with the Production Section). The common workplace produces a kind of concurrent engineering.

As another tool of collaboration, the KJ (Kawakita Jiro) method is widely used in the Japanese workplace to integrate fragmented ideas given by individual workers (Kawakita, 1967). Interestingly, the soft system methodology proposed by Checkland bears close resemblance to the KJ method (Checkland, 1981). One of the challenges facing the Japanese software engineers is to construct computer softwares which can support the KJ method.

C. Tools of Social Construction: On-the-job-training (OJT) and job rotation (JR) are the basic tools of learning-by-doing. These interactions in the common workplace enable the workers to produce the informal communities-of-practice.

In this connection, I would like to point out that Japan has a long history of informal learning such as *toteisei* (apprenticeship) and *terakoya* (private elementary school). Japanese computer engineers seem to be familiar with these old traditions.

COMPUTER SOFTWARE IN JAPAN

Recent developments in the computer media support the traditional groupware in Japan.

A. A community of e-mails, which is a modern version of a community-of-letters in sixteenth century England, supports story-telling as more and more people join the computer network. They communicate multilaterally, formally as well as informally. I find that younger generations usually have their own e-mail addresses of the computer network outside of their company. The computer network expands the network of informal relations among people.

B. To support collaboration, the product model approach is introduced based on the sharing of the product database. This approach is related to the practice of concurrent engineering.

The Japanese workplace already practices concurrent engineering through the sharing of the common work area. In addition to the common work area, people of different sections share the common model of a product through the computer media, enabling them to change the model from their point of view. This is how the product model evolves. The product model approach is important now because of the rapidly changing world market. Among other things, the rapidly changing world market shortens the product cycle, forcing the producers to be quick and flexible in delivering reliable products.

C. To support social construction, the computer-supported cooperative work (CSCW) and related computer technologies are emerging. But we are still in the test period as far as these technologies are concerned.

Developing the computer-supported groupware is crucial for fostering business and management creativity in Japan. For this aim, the immune system gives an important insight, for the immune system is a good model of the computer-supported groupware (Nishiyama, 1994).

Before going into a detailed discussion of the immune model, I want to point out that the Japanese approach to creativity can be described by the immune system. In other words, the immune system seems to be a good model to represent the Japanese and Eastern approach to creativity.

Two models of organization — the Western model and the Eastern model — are compared in Table 2. The Western model can be described by the neural network. In fact, Beer constructed a detailed organizational model based on the neural network (Beer, 1979). In contrast, the Eastern model can be described by the immune network.

Table 2. *Two Models of Organization*

The Western Model	***The Eastern Model***
Neural Network	Immune Network
Formal	Informal
Hierarchical	Lateral
Optimization	Survival

THE IMMUNE MODEL OF JAPANESE CREATIVITY

The immune system is considered to define the "identity" and "self" of a biological individual. If identity is disturbed by a virus or bacillus, the immune system works to avert that disturbance. During this process, an individual changes its identity. The main role of the immune system is not, therefore, to fix identity but to make an individual adapt to a changing environment.

The immune system works based on the horizontal relations among cells. Free motion and incidental encounter are the basic principles of the immune system. The immune system can be characterized by the following five paradigms.

A. Collaborative Work among Diverse Players: Main players of the immune system are macrophage, T-cell, and B-cell. The function of each player differs significantly from those of other players. They collaborate with each other and produce needed antibody and cytokines (information substances). An important point is that they share the common information of antigene. So the immune system already has its own "concurrent engineering" based on the shared database.

B. Detailed Education of T-cell in Thymus and Intestines: For effective collaborative work, detailed education is crucial for the players. Education for T-cell in thymus is already known, and recently intestines were found to be an important location for T-cell education. To construct lateral relationship, such detailed education is essential.

C. Idiotype Network: The key concept of the idiotype network is "internal image". All the external patterns have their internal images (represented by idiotypes of antibody) within an individual body. Internal images are recognized by other antibodies, which have their own internal images. From these dual properties — to recognize and to be recognized — an ensemble of antibodies makes up a dynamic network, where the network includes all the internal images of the external world. If an external pattern penetrates to the body, the network undergoes changes because the relationship among internal images changes. After a series of complex actions and reactions within the network, the network arrives at a new stationary state.

D. Cytokine Network: In the immune system, cells communicate via transient cell-cell contacts as well as via the secretion of information substances (soluble molecules called cytokines). Recent studies have clarified the importance of cytokines as the communication media. These are unified as the field of the immune system.

E. Marker of the Self: T-cell can recognize the antigenes only when they are caught by a marker protein (called MHC generally, or HLA in humans). All macrophages and all B-cells interact specifically with macrophage or B-cell having antigenes. Furthermore, all cells other than macrophages and B-cells have another markers called "Class 1 HLA". So T-cell can attack specifically the infected cells having the marker. This mechanism is called MHS restriction, which is important for security control of information in the immune system.

From the evolutionary point of view, the immune system starts from an assemblage of independent players (macrophage). This is followed by the development of improvisational relationships among the players, each adapting to a complex pattern of interaction of the self with the external world. In the final step, the improvisational relationship is controlled by the field of information substances.

CONCLUSION

The immune network system indicates the importance of "relationalism" and "field or *topos*", which are the basic concepts in Eastern philosophy and social theory. The immune model may thus represent how creativity works in Eastern societies in general and Japanese

society in particular.

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