

# Frames by Subject Levels for Sensemaking of IS Development

Takeshi Kosaka  
School of Management  
Tokyo University of Science  
kosaka@ms.kuki.tus.ac.jp

## Abstract

*Through the development of interpretive research of information systems, IS development has been known as a social reality. As the social reality is unique to each organization, it becomes necessary to make sense of own experiences by reflecting upon them. However, in short of appropriate frames for sensemaking, it is difficult to learn from own experiences. Our aim of research is to develop frames for sensemaking by using Activity Theory as a resource of diagrams on the concept of multiple levels of subjects proposed by Wiley (1988). The frames are used to capture conflicts that occur among individuals, groups, and organizations along with artifacts including IS.*

**Keywords:** interpretive research, information systems development, sensemaking, activity theory, subject levels

## 1. Introduction

Information Systems development (ISD) has come to be considered a social reality by the development of interpretive IS research. Each ISD is a social reality unique to each organization, so that learning from internal experiences becomes important. However organizations fail to learn from their experience in ISD because of limits of organizational intelligence (Lyytinen et al., 1999).

Although there are theories such as Structuration Theory and Actor Network Theory, they are not tangible tools with which practitioners can learn from their experiences. Our aim of research is to develop a tangible tool for learning from internal experiences.

Learning from internal experiences is sensemaking of their own experiences. The substance of sensemaking starts with three elements: a frame, a cue, and a connection (Weick, 1995, p.110). Cues are occurrences or experiences. Frames enable people to locate, perceive, identify, and label occurrences in their lives and world (Weick, 1995, p.109). Connections are human actions that produce meanings by relating cues with frames. With the abundance of occurrences or information, what IS practitioners lack are frames.

By using the notion of subject levels (Wiley, 1988, 1994) and diagrammatic resources in Activity Theory (Engeström, 1999a), we developed sensemaking frames which IS practitioners can use to make sense of their ISD.

## 2. Sensemaking and Subject

In ISD, troubles typically occur among individuals, groups, and organizations. Different sensemakings among them are considered the source of the troubles, and it is our source of research interest.

Weick (1995) who discussed sensemaking in organization called a movement between

groups and an organization as organizing. On the basis of Wiley's idea, he developed the basic notion of sensemaking in organizing. We will return to Wiley, and reconsider subjects or human beings in sensemaking. By clarifying the relation between macro-micro problems in sociology and the subject, he discussed levels of subjects and articulated four kinds of subjects from them. Wiley (1994, p.154) differentiated the four symbolic levels on the basis of their distance from the subject, i.e. the person or self. Followings are the brief summary of his idea (Wiley, 1988).

a) The self or individual level: intra-subjective

This is the human individual. It is at the level of Mead's I-me duality and Peirce's I-you, both conceived as versions of the internal conversation. These two philosophers had a core self or "I." Here the subjective as an individual is called intra-subjective. At the level of the self, meaning is within the self, and the self is, by definition, fully present (Wiley, 1994, p.154).

b) Interaction: inter-subjective

Individuals produce the key conceptual categories of the collective consciousness, indirectly, by virtue of their interaction patterns. Intersubjectivity is emergent upon the interchange and synthesis of two or more, communicating selves. The interactive synthesis of meaning is captured in Schutz's notion of the "we experience." The key point has to do with the way the self or subject gets transformed during interaction. Subjects combine into a dialectic, which might be called joint or emerged or inter subjectivity. In interaction the meaning is not within but between and among selves (Wiley, 1994, p.154).

c) Social structure: generical-subjective

At this level concrete human beings, subjects, are no longer present. Selves are left behind at the interactive level. Social structure implies a generic self, an interchangeable part – as filler of roles and follower of rules – but not concrete, individualized selves. The "relation to subject" at this level is categorical and abstract.

Wiley includes organization at this social structure level, and calls sensemaking at this level generically subjective. Cecez-Kecmanovic (2000) describes this level that social structure reveals itself through roles and norms, administrative and control systems, decision-making processes, policies, that are legitimized organizational knowledge. In social organization the meaning is encoded in abstract, generic, or collective selves (Wiley, 1994, pp.154-155).

Weick (1995, p.72) describes the relation between interaction and social structure as: "Organizing lies atop that movement between the intersubjective and the generically subjective. By that I mean that organizing is a mixture of vivid, unique intersubjective understanding and understandings that can be picked up, perpetuated, and enlarged by people who did not participate in the original intersubjective construction." Intersubjectivity is the source of innovation, facilitating changes, while generic-subjectivity is that of control, enforcing stability.

d) Culture: extra-subjective

The generic self drops out at the cultural level. The abstract subject of social structure, occupying positions and obeying rules, is no longer implied. The notion of culture as extra-subjective was used by Karl Popper in his "Epistemology without a Knowing Subject." The various decenterers of French structuralism and post-structuralism also operate with a culture that lacks a subject.

Knowledge embedded in culture serves as a reservoir of background knowledge allowing and constraining the horizon of possible understanding and meaning at other levels. It should also be noted that Wiley assumes that the subject is always dimly present at every level.

The relation between levels are not static, it is like Giddens' structuration, an ongoing emergent process that combines levels. Weick (1995) defined the movement between the intersubjective and the generic-subjective as organizing.

In our paper, we will use these four levels of subjects and their respective worlds as a base for discussing frames for sensemaking in the following sections.

### **3. Activity Theory as a Frame Resource**

#### ***3.1 The reasons of adopting Activity Theory***

Weick (1995) says that the essence of sensemaking starts with three elements: a frame, a cue and a connection. Here we will discuss that Activity Theory is a excellent candidate to produce the frames.

The object of our research is ISD. The objects of ISD are IS, users and the target of use. Our interest of research is not to make each of them into detail, but to focus on the complexity emerged from all of the three elements. In other words, we want to make sense of the social reality emerged from the use of a specific tool by a specific person for a specific job in a specific work group.

We have Activity Theory for a theory that includes all of them. Here we consider Activity Theory (1999a) a resource for developing frames. The reasons why we adopt Activity Theory are as follows: First, it has explicit treatment of a tool or an artifact that has been historically constructed. It considers that a tool enters in between a subject and an object of doing and mediates them. The concept of tools in Activity Theory transcends dualism such as systems determinism and voluntarism.

Second, it captures not only a subject's doing toward an object by a tool, but also locates the subject into a community, captures the division of labor which individuals undertake, and captures rules in the community. Through the mediation of the division of labor and that of the rules, it captures dialectical relations and conflicts between a subject and the community to which the subject belongs.

Third, it pays attentions to a process by which an object is transformed into an outcome. Thus, it is considered a theory that captures the relevant elements and their relations in order to grasp a social reality around ISD. Furthermore, it has diagrammatic resources for drawing the elements and their relations. They are the reasons why we adopt Activity Theory for frame development in our research.

#### ***3.2 Basic Concepts of Activity Theory***

Activity Theory has an origin in Vygotsky (1978) in the Soviet streams of social-historical research traditions, and in recent years has been enhanced by Engeström (1999a) and others. It is a cross-disciplinary framework for the research of human social practices as a developmental process by inter-connecting individuals and a society.

Most of psychological theories treat a human action as a unit of analysis, and treat it

independent from its situation. Activity Theory, however, considers actions as situated, and has, as an effective minimum unit of analysis, an activity that includes actions.

An activity is a form of doing toward an object. Each activity is identified by each object. The term object is used as the meaning of “object of practice,” furthermore, is related to a motive oriented toward the activity (Hasan, 1999). Today’s Activity Theory includes, as artifacts and tools, signs, languages, concepts, internalized mental models and physical tools. Artifacts carry specific cultures and histories.

An activity is started by a human who is motivated toward an object, and is mediated by a tool. Transforming an object into an outcome motivates a subject. Here, mediation is used to mean not one-way but dual-way process.

The basic form of Activity Theory by Vygotsky (1978) and others shows simply a relation between a subject and an object. Engeström crystallized a framework of an activity into logical interaction that includes a social context such as a community, social rules, cultural rules and the normative division of labor.

The division of labor shows the explicit and tacit organizations related to the transformation of an object into an outcome. Rules are the explicit or tacit norms and customs, and social relations. The three mediations, artifacts, rules, and the division of labor are historically constituted, and are open to further development. This model is named as human activity structure by Engeström (1999a, p.79). He further expanded it into Activity System to show relations between upstream and downstream activities.

### ***3.3 The needs for the development of diagrammatic expression***

An activity is the minimal meaningful context for understanding individual actions. Frames for sensemaking are to capture contexts. Therefore, Activity Theory that tries to capture contexts can be thought to have a value as a resource for development of frames.

For two decades, the activity theory framework has gained increasing popularity within the IT-design communities, but it has mostly been applied as a conceptual framework for researchers (Bertelsen, 2004). It is not used widely in the field of ISD because of the complex concept. It is also because Activity Theory is not operationalized (Kaptelinin, 1996). In fact, Engeström (1999b) also showed the needs for the development of diagrammatic modeling of Activity Theory for its full use, although his activity structure has a diagrammatic expression. This is related to our research interest of the development of diagrammatic expression

## **4. The Operationalization of Activity Theory’s Diagrams by Levels of Subjects**

We develop sensemaking frames by applying the levels of subjects to the diagrammatic resources in Activity Theory.

### ***4.1 Intra-subjective frame***

In the intra-subjective, communication is not dialogue but monologue. Vygotsky (1978, pp.39-40) showed that in case of human and object a mediation by a tool goes in between stimuli and response, human behavior is controlled, by the aid of the mediation, from the outside. The relation between human and object becomes dialectical.

In order to create the intra-subjective frame we employ Vygotsky’s form and add to it an outcome produced by the object and its associated process (fig.1a). A work sequence is not

rigid in the process, and the sequence is subject to personal practices.

The tool is positioned as a convenient one at this level. The tool has “use value” for him or her. For example, Engeström discusses the use of medicine for medical care. Doctors have free choice of medicine and free use of it to treat patients. The use value, however, becomes inconsistent with “exchange value” mentioned later in the generic-subjective.

#### ***4.2 Inter-subjective frame***

At the stage of any beginnings there are free-discussion forums or places about their works. To capture the stages where multiple individuals participate in joint actions, a community is added into the intra-subjective frame (fig.1b). The emergence of a community as a discussion forum implies that people participating in the discussion often find out something common, and that people who speak as “I” start to speak as “we.” It means that they create collective knowledge there. The subjects who feel collective ownership of it are the inter-subjective. At the same time, as suggested by Wiley, the intra-subjective is always dimly present. It is shown by placing the intra-subjective near the inter-subjective in the frame.

This stage corresponds to dialogue stages where innovation is discussed. For example, at IS planning stage at medical institutions nurses tend to use positive expressions, IT as a utopia or IT as expertise, such that IS improves their own medical workplaces (Seligman, 2000). However the positive expressions tend to turn into negative ones after the installation of IS.

#### ***4.3 Generic-subjective frame***

The process of work is well articulated, and is legitimated, then people pursue efficiency with the division of labor. In other words the process of work is fixed into a particular sequence of work for the division of labor. Individuals participate in a community and get some distribution of an achievement. It implies that norms, values, and customs are developed in a community and then applied to its members. The base of frame we can use here is human activity structure proposed by Engeström, and is enhanced to include a process explicitly (fig.1c).

Once rules and processes are prepared, people who did not participate in the development enter the community, and become simply to play roles already specified. The subjective is neither intra-subjective nor inter-subjective, but generic-subjective. However, as mentioned by Wiley (1988), the subject is always dimly present also here. Who has questions to the existing is always the intra-subjective, and who collectively question through interaction are the inter-subjective.

A tool in itself has “use value.” However, it emerges as “exchange value” to the generic-subjective. For example, medicine has use value for a doctor who as the intra-subjective uses it for medical care. Medicine appears as exchange value for making money to a doctor as the generic-subjective in a hospital. A problem, effective or profitable, comes into a conflict between the intra- and the generic-subjective.

Flexible work style usually practiced at the stage of the intra-subjective loses the flexibility when the division of labor is introduced and enforced. In an organization IS plays a role of constraining the way of doing work. The process in the generic-subjective silences the flexibility in the intra-subjective, or acts as a control upon the movement toward innovation by the inter-subjective.

#### **4.4 Extra-subjective frame**

When an individual look down his community and associated communities at the same time, his behavior of looking down transcends the scope of his own community. The subject who practices this kind of behavior is considered to be the extra-subjective.

In actual societies, communities are not closed alone in themselves. For example, a subject there is the one that is produced by another community such as a school. Rules utilized there are not necessarily created by themselves but sometimes produced by other communities like governments. Outcomes produced by them can become tools, subjects, rules and so on in other communities. Engeström (1999a) calls the relations as an activity system. The intra- and the inter-subjective are dimly present also at this level (fig.1d).

Here the extra-subjective does not capture individual activities, but is at the position where it looks down activities and their relations. From it, there emerge considerations toward upstream or downstream activities, that is, understandings of differences between cultures. It may be feedback to the intra- and the inter-subjective, and then generates understandings of the historicity of tools and subjects, that is, understandings toward their origins, and brings clear perceptions and improvement of problems.

#### **5. Discussion and Conclusion**

We developed four diagrammatic frames of sensemaking for ISD by using Wiley's concept of levels of subjects and the diagrammatic resource in Activity theory. Beyond Weick's organizing, in case of ISD, we can use intra-subjective frame to capture an individual action, extra-subjective frame to develop customer-oriented IS, and inter-subjective and generic-subjective frames to capture the organizing.

Understanding an ISD as a technical system will leads to the construction of a rigid organization of generic-subjectivity, in other words, an organization and IS defined by functions only. Understanding an ISD as a social system will lead to making sense of the environment by using extra-subjective frame, and also will lead to diagnosis with inter-subjective frame. As innovations start in intra-subjectivity, it is necessary to understand individual users and developers with intra-subjective frame.

Our aim of research was to develop diagrammatic sensemaking frames for ISD. They can be used to make sense of actions and thinking of stakeholders in ISD at a specific time. However, there is still the needs for the development of sensemaking frames for capturing continual changes in ISD.

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Fig.1 Frames for sensemaking

