INTELLECT TRANSMISSION SUPPORT BASED ON ORGANIZATIONAL INTELLECT MODEL

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ABSTRACT

In order to establish the intellectual identity of the organization, it is important for each organization to revitalize creative activity in the inside and attract the intellectual interests of the outside to the organization. This paper proposes the framework to support attracting the outside with transmitting the organizational intellect. We have developed models of organizational intellect and a support environment for creation and inheritance of organizational intellect based on the model. This paper proposes concepts to design attractive information for the outside in terms of intellectual activity and a support system to transmit organizational intellect based on the concepts.

KEYWORDS

Knowledge management, Organizational memory, Ontology

1. INTRODUCTION

A variety of intellects in an organization and its growth are major source of high competitive power for an organization[Nonaka 95]. In the growth of organizational intellect, it is for each organization important to exchange intellects not only in the inside but also with the outside[Wenger 02].

This study aims to develop information systems to support the exchange both in the inside and with the outside. Focusing on the latter, this paper proposes the framework to support attracting intellectual interest from the outside by transmitting the organizational intellect effectively.

2. AN OVERVIEW OF INTELLECT EXCHANGE SUPPORT

Here are important issues that this study is interested to support with information systems;

(A) Revitalization of activities for creation and inheritance of organizational intellect

- **Supply of guidance:** Most of organization has criteria, patterns and styles for selecting and crystallizing the organizational intellect. In this study they are called "Norm" [Jonassen 00]. Guideline for organizational activity meeting these norms directs organization members to the desired process of creation and inheritance of organizational intellect.
- **Increase of organizational intellect awareness:** It is requisite to make organization members possible to be aware of relationship among people, intellects and vehicles. That clarifies answers for questions in the daily organization activity such as, *Who knows the intellect well? Who are better to collaborate together? Which vehicle is useful get the intellect?*

(B) Transmission of organizational intellect to the outside

- **Selection of intellects to transmit:** Based on understanding on organizational intellect, the organization set up the purpose of the transmission and defines the scope of it.
- **Conversion to presentation:** The organization finds the style that's best suited to the intellect one wants to transmit. The intention of the transmission should be reflected in the style.

Figure 1 shows the overview of this project focusing on (B). Dual loop model (DLM) and Intellectual genealogy graph (IGG) form the foundation to provide organizational intellect awareness information for both the inside and the outside in the light of not only the intellect itself but also its formative process.

DLM implies the organizational norm. This model represents a process of change of intellect in an organization from both viewpoint of each member's activities and the organization ones[Hayashi 01]. This model serves as a guideline for the creation and inheritance of organizational intellect.

IGG is a model that represents chronological correlation among persons, activities, and intellect in an organization as an interpretation of activities of organization members based on DLM[Hayashi 02]. IGG is generated from activities with vehicles, which are things that support transmission of intellect among people, for example, text, figure and so on. An IGG records activities relate to intellects in the organization besides existence of them. Such information forms the foundation to answer questions in the daily activities

Site map is a model describes structure of intellects to transmit. This is composed of content level and presentation level. The content level model is a subset of an IGG, which is extracted with the intention to transmit the organizational intellect. The content level model is transformed into the presentation level one in order to display on WEB browser and so on.

Based on these models this project aims to develop information systems to support both (A) and (B) as mentioned before. In order to support (A), it is crucial to prompt the members' spontaneous activity by providing organizational intellect awareness information based on IGG as well as to direct their activity by presenting guideline on the activity along to DLM. On the other hand, in order to support (B), it is crucial to prompt organization to grasp the big picture view of its own organizational intellect by presenting IGG as well as to make the organization possible to bring out the best for transmission; besides, it is also important to prepare a mechanism for conversion from the content of transmission to the presentation of it.

To discuss these matters as a whole is beyond scope of a brief paper. We may leave the details of support for (A) to [Hayashi 01]. This paper focuses attention on support for (B). In the following chapter I shall be examining the model and support functions for organizational intellect transmission.

3. ORGANIZATIONAL INTELLECT TRANSMISSION SUPPORT

Before turning to a closer consideration of the model and support functions, a few remarks should be made concerning an outline of design process for organizational intellect transmission model. The model and support functions will be discussed further in 3.1 and 3.2 respectively.

As shown in figure1, a site-map consists of content level and presentation level. Here lists tasks that designers carry out in the design process of a site-map.

In the content level design process, designers select organizational intellect which will be transmitted to the outside. Here are tasks for the design.

- **To understand the status of organizational intellect:** Referring IGG, a designer understands the development process of persons, intellects and vehicles in the organization.
- **To select subjects to transmit to the outside:** The designer selects persons, intellects, vehicles and activities that are expected to attract the intellectual interests of the outside to the organization.
- **To set up a purpose of the transmission:** The designer clarifies the intention of the transmission. The intention implies how the organization would like the outsider to understand the intellects.
- **To have the perspective for transmission:** An IGG represents relations among persons, vehicles, activities, and intellect in the organization. In order to extract attractive structure from IGG, the designer select necessary relations according to the purpose.
- **To prune away superfluity for transmission:** Organizations not always transmit all the items in the structure. The designer remove items that the organization can't publish the outside.

On the other hand, in the presentation level design process, designers decide how to display the organizational intellect to the outside. This is similar to common tasks for website design. Here are tasks for the design for presentation level.

- **To select a presentation template according to the transmission intention:** The designer selects a template that defines the presentation style. Then, the content level model is converted to the presentation level model by the site conversion module.
- **To coordinate the presentation of the organizational intellect:** The designer coordinates the presentation, for example, addition of text, arrange the layout and so on.

3.1. Concepts for organizational intellect transmission

This study proposes a framework to describe relation between the presentation level, which is embodied as web pages, and the content level, which describes meaning and intention of the presentation level, from the aspect of creation/inheritance of organizational intellect.

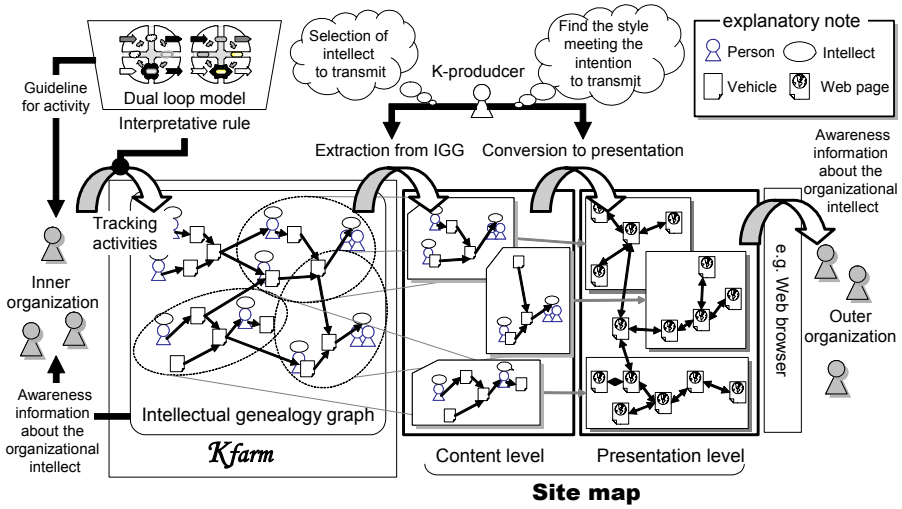

Figure 1. An overview of intellect exchange support

Table 1 summarizes concepts to describe the presentation level model and the content level one. In order to discuss how the content level model describes information from the aspect of creation/inheritance of organizational intellect, we shall concentrate on *Attractive frame*, *Theme*, and *Site pattern*.

- *Attractive frame*: A unit of organizational intellect awareness information is called *Attractive frame* in the content level. An *Attractive frame* consists of a *subject* and *related items* as shown in table 1. Extracting an *Attractive frame* as a part of IGG is helpful for the outsider to see the organizational intellect and for the organization to maintain the transmission information.
- *Theme*: *Theme* describes how the organization expects the outsider to recognize the organizational intellect. The *Perspective* implies notable relations in IGG according to the *Purpose* in order to realize the expectation. A *Perspective* set according to the *Purpose* indicate a policy to select *Related items* in the design process as well as a record of the intention of the selection after the process.
- *Site pattern*: *Site pattern* is framework to describe pattern to select *Related items* according to the *Purpose* and the *Perspective* of the *Theme*. For example, when the organization would like to attract the outsider to competency of itself, it is effective to transmit the intellect as well as activities related to the formative process of the intellect.

3.2. Support function for organizational intellect transmission

This study aims to design and develop an organizational intellect transmission support environment based on the concepts mentioned in the previous section. Here are necessary functions for the environment.

- To lead designers into coordinating content and intention of transmission
  The concepts mentioned in the previous section are provided as the basis of Site map design for designers through the environment. That facilitates designers' recognition of importance of coordinating transmission content and intention.
- To provide the lines of thought in Site map design by Site pattern
  Site pattern describes noteworthy relations in IGG according to the *Purpose* and the *Perspective* of the *Theme*. Based on the description, the environment provides for designers with the candidates for *Related items* as reference information.
- To convert the content level to the presentation level
  The site conversion module converts the content level model, which is represented by RDF and OWL, into the presentation level, which is web pages represented in HTML and so on. Base unit of mapping between the content level model and the presentation level one is *Description* and *Page*. This mechanism makes it possible to semiautomatically generate presentation level model and to provide the content level model as metadata of the site map in standard form.

Figure 2 shows an image of Site-map model generation. The web page (C) on the right of figure 2 is the presentation level of the sitemap model as a result of the generation. It displays a new paper just submitted to an international conference and the hyper links to those people, intellects, vehicles and activities which are related to the intellect on the paper. The hyper links in the web page is set based on relations in the IGG (A).

(A) shows all the nodes and links retrospectively reachable from the subject paper in IGG. The arrows

Table 1 Concepts for Site map model

Level	Concept	Explanation
Content level	*Description*	Description of a person, an intellect, a vehicles and an activity in IGG
	Attractive frame	A network of *descriptions* to be transmitted to the outside This is extracted from IGG with the organization's intention.
	— *Subject*	A *description* of a person, an intellects, a vehicle or an activity that is presented as a subject of an *Attractive frame*
	— *Related items*	*Descriptions* presented together with the *Subject*
	Theme	Description of intention of an *Attractive frame*.
	— *Subject*	A person, an intellect, a vehicle or an activity that is noteworthy item in the *Attractive frame*. It corresponds to the *subject* of the *attractive frame*.
	— *Purpose*	Expectant effects of the *attractive frame* on the outside.
	— *Perspective*	Necessary relations to display the *Subject* attractively according to the *purpose*.
	Site pattern	Pattern of extraction of an attractive frame from IGG.
Presentation level	*Page*	A web page that expresses a *description*.
	Cluster	A network of *pages* that corresponds to an *attractive frame*.
	Cluster top page	A *page* that corresponds to the *subject* of an *attractive frame*.

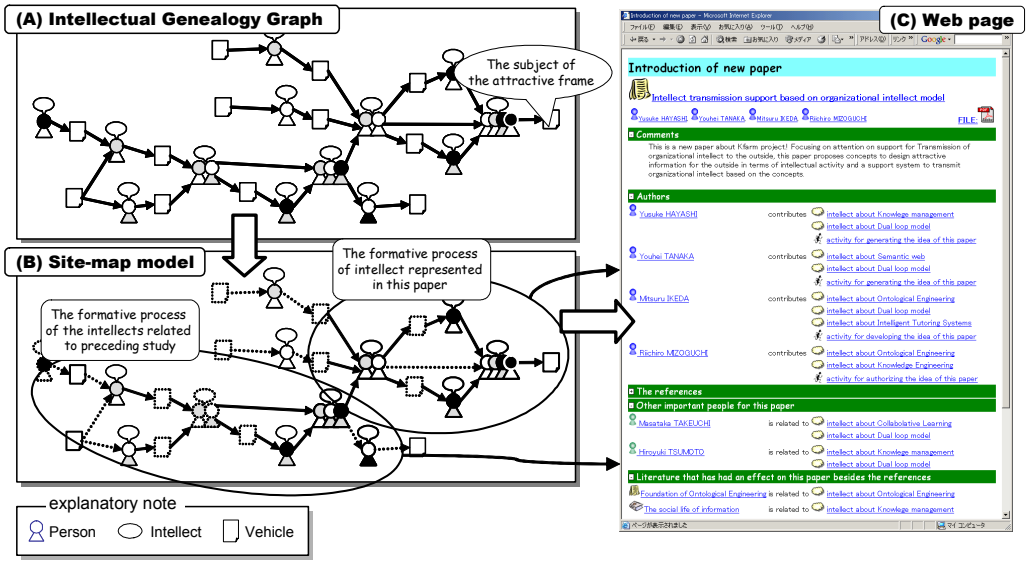

Figure 2 An image of generation of Site-map model

indicate directed link among people, intellects and, vehicles and activities. A typical directed link means, for example, a destination intellect is derived from a source one. The relations reflected in the hyper links are selected by the designer according to the perspective. In this case, the perspective focuses on the organization members' contribution to the subject paper. Tracing the links retrospectively from the subject in IGG, the designer prunes away confidential and irrelevant node to make the sight map secure and easily understandable for the outside. In figure 2(B), broken lines indicates the links pruned away. The remaining nodes are important activities or intellects in the formative process of the subject. This extraction can find out the relations that are not described clearly in the vehicle. Then this model is converted to the web page as the presentation level model by the site conversion module.

4. CONCLUDING REMARKS

This paper discusses organizational intellect transmission support, which aims to activate intellect exchange with growth of mutual enlightenment between organizations. A further direction of this study will be to accumulate site patterns and to develop the support environment with web standard technologies.

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