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A Study on the Solutions "Menu" Development Support System

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Nowadays, many companies are developing a new style of business called *solution business*. This style of business is becoming important more and more because companies should adapt quickly to the user's needs ranging widely. However, studies on what is solution business and how to support it effectively have not been sufficient so far. In this research, first, we clarify the feature of solution business and the role of *solution menu* based on an extensive survey, and then we develop the formal method of menu description in terms of *ontology* and the menu re-composition support method reflecting the feature and the role.

(1) Definition of solution business

Solution business has been explained generally as business to solve customer's problem by utilizing the information technology. But this definition is insufficient to describe the wide range of business domain which the solution business is treating today.

To clarify the definition of solution business, we refer to characteristics of information industry and industries for social infrastructure as follows.

1. Same components, such as hardware and basic software, are used as platforms to construct every system.
2. There is a difference in the function for which each customer requests the system.

Consequently, there exists a gap between the function of platforms and the needs of

customers.

Based on this consideration, we define the solution business as follows : *solution business is a business which offers something suited the each customer's needs using the platforms as foundation.*

(2) Definition and role of the solution menu

Referring to the theory of “Product system view”, which is a research on innovation in product development, a solution menu is defined as follows : *solution menu is a conceptualization of what utility to offer with the solution and how to offer it.*

We characterize the role of solution menu as follows.

1. A solution menu is a guide to develop the function of service and component which constitutes the solution.
2. A solution menu is formed from the knowledge gained from the study of actual projects for customers.

From these considerations, it was found that the description form requires the following three points.

- A. Description of the existence in the domain of a solution
- B. Description of the menu as a conceptualization of the utility to offer
- C. Description of each project and correspondence with them and the menu

(3) Formal description of solution menu with ontologies

We design the following new ontology corresponding to the above-mentioned three points A – C, because the existing ontologies are inadequate for them. We consider the three required functions of ontology as follows.

(i) The framework of conceptualization of subject

- Domain ontology : A definition of the entity with state variables (corresponds to the above-mentioned A).
- Menu ontology : A definition of operation to change the state values of some entities (B).
- Instance : A set of the entity whose values of states are set (C).

(ii) Description form : Define by the XML schema language.

(iii) A definition of taxonomy

- Domain ontology : The relationship defined by the rigidity property of entities
- Menu ontology : The relationship defined by the order of state variable transition

Actual solution offering activities can be modeled as applying an operation of menu

ontology to the instance showing an individual project. In this research, we propose a method to suggest conceptual relationship, which was not taken into consideration at the time of menu system creation. We use the instances of each project accumulated by the model of actual activities to judge the rigidity of an entity.

In order to check the validity of the developed ontology, we create the solution menu system the design pattern of software development organization. The ontology's function to describe solution menu system is evaluated as follows.

1. It can describe various concepts in single form.
2. It can describe the menu in simple form.
3. It can be used as a standard to conceptualization of design pattern.
4. It can describe an actual organization of software development as an instance.

These abilities are useful not only for describing the software development organization, but for general solution menu. So we concluded that the ontology developed in this research is useful as a tool for solution menu development support.