# User Interface Constructed on the Contextual Knowledge that Describing Ontology

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***Abstract – The paper describes some approaches to UI design automation based on the contextual knowledge that describes ontology domain. Tools interface development based on ontologies software, based on the principle of separation of designing and implementing the user interface and business applications and their subsequent binding and automatic code generation interface for its model. To develop the proposed ontology, in terms of which UI developers form the corresponding components of his model; generation interface is more programming languages on different platforms; supports both local and network interaction with business applications; Model interface is divided into components according to groups of professionals engaged in its development (subject area experts, programmers, designers) and contains all the information necessary for its development and automatic generation according to the model.***

Keywords – design, implementation, ontological modeling, models, approaches and methods of design automation interface, intelligent information systems.

## I. Introduction

Currently, the actual problem is conceptual formation "transparent" representations for weakly structured domains. Today the leading paradigm structuring information flows are ontologies or hierarchical conceptual structures that formed the analyst on the study and structuring of information flows, documents, protocols learned contextual knowledge and other sources.

Ontological engineering (OE) develops the main provisions of engineering knowledge – science models and methods of collecting, structuring and formalizing knowledge.

Ontological engineering is taking its first steps, so each analyst goes through trial and error, creating complex ontological structures that reflect the maze of professional knowledge in various application areas.

However, knowledge engineering – an area of artificial intelligence, while the OE covers a wide range of applications – from knowledge management systems to distance learning.

Today artificial intelligence – a broad area of research and development of intelligent systems intended for use in areas of human activity, it is difficult formalized. Currently, decided to allocate several areas of artificial intelligence. One of the areas associated with the development of intelligent systems based on knowledge. In this direction are developing models of knowledge, creation of knowledge bases.

One of the promising applications of the methods of this area is the development of intelligent systems instructive. IIS intended for automation and individualization of learning. Traditionally, there are four models of knowledge used in the construction of knowledge bases of knowledge-based:

1. Logical model;
2. Production model;
3. Framed model;
4. Semantic networks.

But, currently of particular interest to researchers in artificial intelligence cause ontology. Ontologies can be used to represent knowledge about the subject area concepts and alleged relations between them, describe the content of web pages. In addition ontology can be used in the construction of knowledge bases ITS not only, but also any other programs.

Ontology is central to the systems using knowledge. Ontology is a formal model of the conceptualization of the domain [1]. This model contains a definition of the domain entities and relationships between them. Building software systems based on ontologies avoid re-conceptualization of the domain, which allows to reduce the use of resources at the analysis stage and system design.

## II. Organization of the formation and renewal of contextual knowledge learning intellectual system

Ontology development in a particular subject area knowledge is a very complex and lengthy process, when for several years a group of developers creates a set of concepts of the domain ontology. Therefore, the system of formation of ontological knowledge base contains integrated tools combining ontologies that let you create and complement the main domain ontology learning environment through the use of subject knowledge (knowledge of software), presented the Semantic Web. Such ontologies will be called ontologies that complement or to simplify – components.

The source component ontology search system is multi-ontological information domains. Searches this system formed on the basis of tasks and thesaurus software expert local knowledge base. Found ontologies relevant components from external repositories and other educational resources are loaded semantic Web search engine to Business database integrated credit union ontologies [2].

It is necessary to consider some approaches to UI design automation based on the knowledge that describes ontology domain. Tools interface development based on ontologies software, based on the principle of separation of designing and implementing the user interface and business applications and their subsequent binding and automatic code generation interface for its model. To develop the proposed ontology, in terms of which UI developers form the corresponding components of his model; generation interface is more programming languages on different platforms; supports both local and network interaction with business applications; Model interface is divided into components according to groups of professionals engaged in its development (subject area experts, programmers, designers) and contains all the information necessary for its development and automatic generation according to the model.

## III. Design and implementation of ontology learning system

Approaches and methods for automated user interface design based on ontology software designed to address the following issues:

- Providing support for the development of sophisticated and complex interfaces (based on high-volume models the concepts of dialogue and manual tasks);
- Automation interface development to meet the requirements of users and their experience level of the computer; environment using a software system; taking into account the principles of "usability" (convenience and simplicity), different standards and guidelines for the development of style;
- Providing scalability for application of new knowledge about design, new guides users through style and standards development.

Design and implementation of ontology is carried out on the following principles:

- *clarity* – ontology must efficiently transfer sense imposed deadlines;
- *consistency* – the definition should be consistent; extensibility – ontology should be designed so as to ensure the intended use for the separation dictionaries and terms that allow the possibility of expansion monotonous and / or specialization without the need for revision of existing concepts;
- *minimum impact coding* – conceptualization, the underlying ontology created must be specified at presentation, not the character encoding; minimum ontological commitments – ontology must contain only the most important assumptions about the world that is modeled to leave the possibility for expansion and specialization.

The process of creating an ontology includes three procedures:

Project management: planning, monitoring and quality assurance. Planning to determine which tasks should be performed, how they are organized, how much time and what resources are required for their implementation. Control ensures that scheduled tasks performed exactly as expected. Quality assurance need to be sure that components and products in general are at a given level.

Own development: specification, conceptualization, formalization and implementation. The specification defines the goal of an ontology, its intended use and potential users. Conceptualization provides structuring subject knowledge in a meaningful explicit model. The formalization of the conceptual model transforms the formal or "computer". In implementation of appropriate computer model programmed knowledge representation language.

On the wave of interest in ontology created tools and mechanisms specifically targeted the wide use of ontologies in problems of intelligent search, classification, identifying inconsistencies in the data model the behavior of intelligent agents.

The main provisions of the UI design automation is [3]:

1. Increased general model user interface: the interface to the model adding new components – user models and model environment (in this case -o PO) using the program (to describe the various contexts of use).

2. Separation of knowledge needed for design automation at the groups that need iterative sequence for further automation.

3. Development of ontology software for each group MPO knowledge, in terms of which will be modified (change) knowledge of automation for each stage according to the requirements of a particular development or development of the subject area as a whole.
4. Development of a method of design automation interfaces based on the use of ontologies in the system software knowledge to the exclusion of modification of the method for changing knowledge.

## Conclusion

On the wave of interest in ontology created tools and mechanisms specifically targeted the wide use of ontologies in problems of intelligent search, classification, identifying inconsistencies in the data model the behavior of intelligent agents. But even having a good tool environment does not eliminate the problems associated with the difficulties of designing and building the most ontologies, and ontology extraction process automation as a whole, job acquisition of knowledge, and the present have their effective solution. Especially valuable are already developed ontologies and experience to use them for a wide range of tasks.

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