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ONTOLOGY OF DIGITAL COMPUTER ONLINE LEARNING PLATFORM

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ОНТОЛОГІЯ ЦИФРОВОГО НАВЧАЛЬНОГО ПРОСТОРУ ОНЛАЙН КОМП'ЮТЕРНОГО ПРАКТИКУМУ

В роботі розглянуто структуру сучасної системи онлайн-навчання, яка побудована на основі добре продуманої онтології навчальних ресурсів та характеризується інтелектуальною архітектурою. Запропонована онтологія має елементи всіх компонентів загальної онтології, включаючи класи, атрибути, відношення та інші компоненти, які необхідні для створення повноцінної моделі. Онтологічна модель розроблена із застосуванням сучасної теорії мульти-клауд систем баз даних, платформа має удосконалений інтерфейс користувача, який враховує досвід виконання та перевірки завдань кінцевими користувачами(студентами). Базова реалізація системи здійснювалася за допомогою інтерактивної навчальної платформи з відкритим кодом «Артеміс». В статті представлено архітектуру системи “Артеміс” та розглянуто її компоненти. Онтологічна модель включає набір компонентів та зв'язків між ними. Важливим компонентом є автоматизована функція оцінки виконання завдань, яка додає ефективності процесу оцінювання виконаних завдань, завдяки чому користувач може побачити свої помилки та результати виконання завдань, а також теоретичний матеріал щодо конкретного завдання.

Introduction. In the dynamic landscape of modern technology, the strategic integration of ontology and architecture takes on heightened significance, particularly in the context of our innovative database online training platform. Ontology serves as the intellectual framework, providing a cohesive understanding and representation of intricate database concepts. The article describes the ontological model and several architecture services of the online learning platform. The ontological model is developed using the modern theory of multi-cloud database systems, the platform has an improved user interface that takes into account the experience of performing and checking tasks by end users (students). The basic implementation of the system was carried out using the Artemis open source interactive training platform. The article presents the architecture of the Artemis system and considers its components. An ontological model includes a set of components and connections between them. An important component is the automated task evaluation function, which adds efficiency to the process of evaluating completed tasks, so that the user can see his mistakes and the results of the tasks, as well as theoretical material on a particular task.

Ontology of digital computer online learning platfor. Ontology is a system for organizing and representing knowledge within a specific domain. Ontologies are used to organize, structure, and understand information in a variety of fields, from artificial intelligence and natural language processing to biology and business intelligence. An ontology includes a set of concepts, classes, and relationships that define a subject area. It allows you to formalize knowledge and create structured

models that facilitate the processing and exchange of information. Ontologies are often used to develop intelligent systems that can understand and process information at a level that is understandable to humans. The main algorithm for creating an ontological model is based on the collection and structuring of meaningful information.

Information ontology - stores information about the objects (categories of objects) of the subject area that are intended to be displayed to the CIT user. Controlling ontology - stores information about the peculiarities of functioning of specialized program modules. Ontological presentation template - an ontology containing descriptions of software components that provide specialized thematic functions when used within an interactive document.

The actual ontology of the online learning platform includes such main components as: study course, person, feedback, estimation, exercise, events. (Fig. 1)

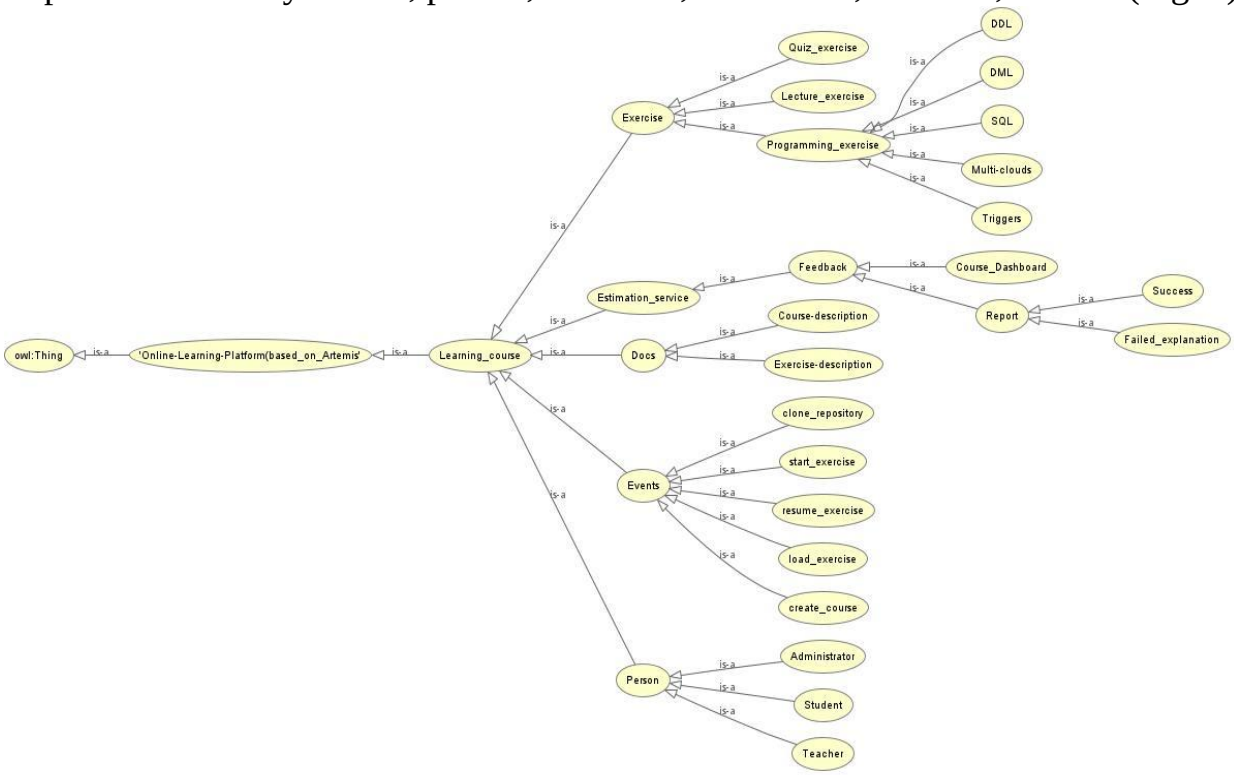

Fig.1

Proposed ontology was built using Protégé-2000 open-source ontology builder developed by Stanford University. An ontology contains a variety of relationships between classes, including associative, part-whole, inheritance, and class-data. Inheritance transfers attributes from a parent class to a child class, and all classes are related to instances through "class-data". Thus, the ontology which we build perfectly achieves our online-platform requirements.

Architecture. Main focus is on the 3 components, they are: Feedback Service, Exercise Management Service and Exercise Participation Service (Fig. 2). Those components make a major part of work on the platform. Feedback service is responsible for analyzing, estimating and making reports about each request the user sends to check their task in the exercise of the course. Moreover, it is connected with Exercise Participation Service that is mainly responsible for tracking user progress on

the platform and analyzing all the information given from Feedback Service. The next component is Exercise Management Service. It is called every time a student starts a new exercise because the intelligent system is optimized to save memory, so it creates the actual repository for the exercise only when it is requested from the end-user. Furthermore, Exercise Management Service is responsible for creating the actual courses and exercises inside them, so each time the administrator creates the course it automatically updates it to each of the users on the platform that was assigned to it.

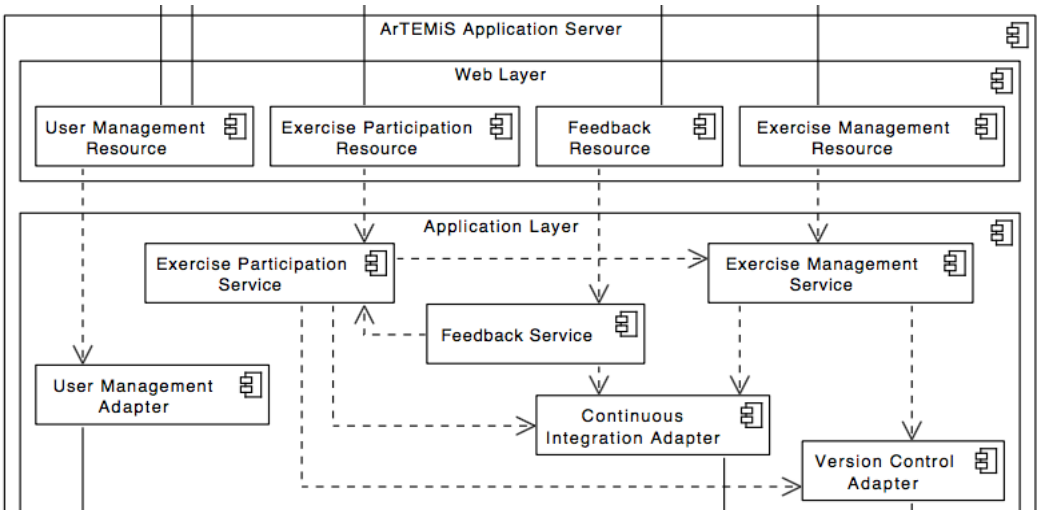

Fig. 2. Architecture of the “Artemis” open-source interactive training platform.

Conclusions. This article considers the practical experience of constructing the ontology that was built using Protégé-2000 open-source ontology builder developed by Stanford University and architecture of the digital educational space of the online computer workshop from the database course, which allows automatic verification of tasks. Using the proposed ontological model allows users to get a detailed description of errors and task results. The proposed technical solution was developed and tested together with the Technical University of Dresden for the course "Databases."

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