

# opción

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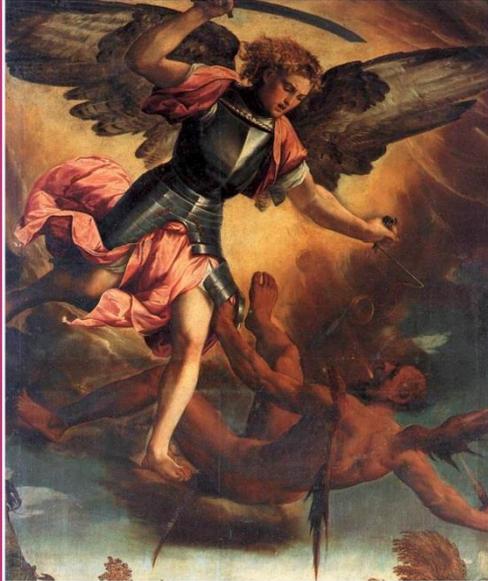
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Universidad del Zulia  
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## **Need of Ontology Based Systems in HealthCare System**

**Sulistyo Andarmoyo<sup>1\*</sup>, Gusmaizal Syandri<sup>2</sup>, Phong Thanh Nguyen<sup>3\*</sup>, E. Laxmi Lydia<sup>4</sup>, K. Shankar<sup>5</sup>**

**<sup>1</sup>Universitas Muhammadiyah Ponorogo , Indonesia**

**\*sulistyoandarmoyo@gmail.com**

**<sup>2</sup>Universitas Muhammadiyah Sumatera Barat, Indonesia.**

**<sup>3</sup>Department of Project Management, Ho Chi Minh City Open University, Vietnam; phong.nt@ou.edu.vn**

**<sup>4</sup>Professor, Vignan's Institute of Information Technology(A), Department of Computer Science and Engineering, Visakhapatnam, Andhra Pradesh, India; elaxmi2002@yahoo.com**

**<sup>5</sup>Department of Computer Applications, Alagappa University, India. shankarcrypto@gmail.com**

### **Abstract**

**Recently on the Semantic Web the healthcare is consider as one of the finest topic. To match the concept to the indexed documents into s set of representative the textual query is transformed. For apt documents manually the end user still has to search. In this way it becomes a crucial task to detect the information of patients. The theory of object is its relationship is considered as Ontology. In information science and computer science the ontology encompasses a definition, representation and formal naming of the relations, categories and properties between entities, concepts and data that substantiate all, many or one domains of discourse.**

**Keywords- Semantic Web, healthcare, Ontology, theory of object.**

## **Necesidad de sistemas basados en ontología en el sistema HealthCare**

### Resumen

Recientemente en la Web Semántica, la atención médica es considerada como uno de los mejores temas. Para hacer coincidir el concepto con los documentos indexados en un conjunto de representantes, la consulta textual se transforma. Para documentos aptos manualmente, el usuario final todavía tiene que buscar. De esta forma, se convierte en una tarea crucial detectar la información de los pacientes. La teoría del objeto es su relación es considerada como ontología. En ciencias de la información y ciencias de la computación, la ontología abarca una definición, representación y denominación formal de las relaciones, categorías y propiedades entre entidades, conceptos y datos que corroboran todos, muchos o uno dominios del discurso.

Palabras clave- Web semántica, salud, ontología, teoría del objeto.

### I. INTRODUCTION

It is seen that the health records of patient digitization is becoming more important day by day because while it going to the hospital the patients are free from carry the big file of data physically with them [1]. Due to use of computing and networking technologies all sharing and storing becomes more convenient. So for several benefits all Healthcare Service Providers move towards the cloud computing. To demands of healthcare and patients service providers cloud promises to offer [2].

The theory of object is its relationship is considered as Ontology. In decentralized and dynamic users while focusing on PHR access control, many systems used approaches which based on ontology. In cloud it represents the relationships and user at a conceptual level. To restrict and regulate the disclosure of data in health care the access control mechanisms used [3].

### II. ONTOLOGY

The theory of object is its relationship is considered as Ontology. In information science and computer science the ontology encompasses a definition, representation and formal naming of the relations, categories and properties between entities, concepts and data that substantiate all, many or one domains of discourse.

To organize information and to limit complexity into knowledge and data every field creates ontologies [4-5]. Within the domain their use a hopefully improves problem solving as it made the advance ontologies. Between each of the languages when maintain a controlled vocabulary of jargon [6] by experts from different countries the problem made easy the translating of research papers within every field.

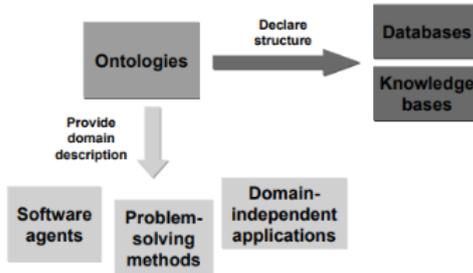


Figure 1: Concept of Ontology

### III. DATA INTEGRATION BASED ON ONTOLOGY

From multiple heterogeneous sources to effectively combine information or data the Ontology-based data integration include the utilization of ontology. It may be classified as GAV (Global-As-View) [7] and it is consider as one of the multiple data integration approaches. On expressivity and consistency of the ontology that is used in the process of integration closely ties the effectiveness of ontology based data integration

#### Ontologies role

In assertion of applicable named relationships and heterogeneous information systems the unambiguous identification enables in Ontologies the entities are connected together by that. The ontologies play the roles as given below:

##### a. Explication of Content

Through the relationships and explicit definition of terms in the ontology from multiple sources the ontology enables accurate interpretation of data.

##### b. Query Model

By using the ontology as a global query schema in some systems like SIMS it formulated the query.

##### c. Verification

From multiple sources used to integrate data it map verification done by ontology. These mapping can be system generated or user specified.

#### IV. ONTOLOGIES TYPES

On the level of generality it can classify the ontologies. Some ontologies types are as follows:

1. For problem-solving methods of particular tasks it uses task and method ontologies [8]. On domain knowledge they are used for reasoning.
2. To capture general knowledge top-level or generic ontologies are used. it is also known as common sense ontologies. Across various domains the defined conceptualizations are valid.
3. The knowledge is containing in Domain ontologies for a particular domain type that is valid like mechanic, electronic and medical.
4. Without stating that what is represented the representational entities provided by Representational ontologies. To any specific domain they do not commit themselves. Frame Ontology is example of the well known representational ontology. Concepts like slot constraints, frames and slots are defined, in frame-based or object-oriented way it allow the expression of knowledge.
5. In the World Wide Web for describing the content of information sources the meta data ontologies provide a vocabulary.



Figure 2: Types of Ontologies [9]

#### V. CONCEPTUAL ONTOLOGY

In a specialization or generalization hierarchy the relation or concept are ordered in general. The kernel of an ontology is constitutes as type hierarchy. It called as type hierarchy ontology if ontology contains only type hierarchy. By associating to each type its definition it can extend the minimal definition of an ontology. The outcome is a definitional or terminological ontology.

With the descriptions to each type its instances it can associate. It is well notable in Cognitive Science, Philosophy and linguistics that some is the type of real world that have no complete and clear definition however just an authoritative depiction that portrays limitations on the utilization of the

type. Other types of “real-world” have just a bunch of diagrams that represent the utilization of the sort in like manner circumstances. By a prototype however other “real-world” types are “introduced” [10]. By a prototype it can present other “real-world” types. Several types of Conceptual Structures include prototype constitute, canon, type definition, individual description and schemas cluster. It is called as commonsense or knowledge based ontology [11] to the ontology that is constituted from these Conceptual Structures.

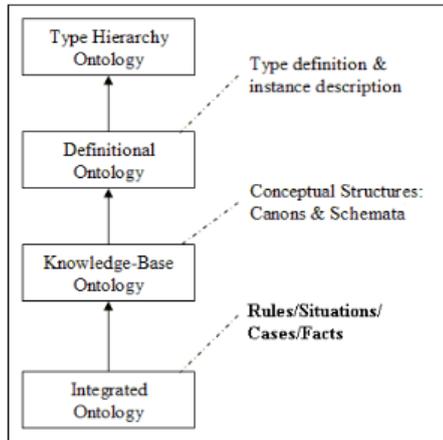


Figure 3: Ontology Types hierarchy

## VI. HEALTH-CARE ONTOLOGIES

Within a relationships and domain the ontology is known as knowledge model that represents a set of concepts among these ideas. Within a domain the Ontologies not only facilitate the only representation but also instance-based reasoning and concept instantiation. On the World Wide Web for sharing and publishing ontologies the OWL is consider as a semantic markup language. In the OWL language tree version as maintaining computational completeness the OWL D [12] reaches the maximal expressiveness.

In biomedicine it widely applied the Ontologies and in multiple online ontology libraries made it aviable like Protege library, Biomedical Ontologies Foundry, Biportal, Open Biological Ontologies Foundry etc. To the development of biomedical ontologies various ontology editors as Protégé have also contributed. About health-care management between biomedical subdomains and ontologies it suggest a distinction by a review of published biomedical ontologies.

Inside a connections and area the cosmology is known as information model that speaks to a lot of ideas among these thoughts. Inside an area the Ontologies encourage the main portrayal as well as example based thinking and idea launch. On the World Wide Web for sharing and distributing ontologies the OWL is consider as a semantic markup language. In the OWL language tree form as keeping up computational fulfillment the OWL DL arrives at the maximal expressiveness [13].

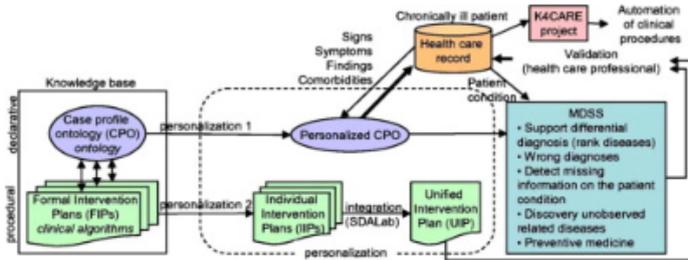


Figure 4: On the basis of ontology personalization of health-care [14]

## VII. PUBLIC HEALTHCARE SYSTEM BASED ON ONTOLOGY

In a database in emergency doctors, nurse, medical services, patients' records are stored and in Web Ontology Language (OWL) format it can be accessed. To classify the records that stored in database it used the Meta data modeling. To map the input to output data this model can easily help. For the database technology and concepts it can consider as next emerging generation to the Ontologies.

For the web the exact relationships between information and web and description is about ontology.

The exact relationships and description of things is about Ontology [15].

OWL stands for Web Ontology Language

By application of computer to be read the OWL was initially developed.

As compare with RDF the OWL comes with a huge vocabulary. From the special interest groups and various countries all over the world for the bazillion sets of data being added to the web the RDF is used.

To process the content of web information the OWL was designed to give a common way.

With the use of elements of RDF language with greater machine interpretability the OWL is consider as a stronger language.

For processing the information it designs the OWL.

In a database in crisis specialists, nurture, medicinal administrations, patients' records are put away and in Web Ontology Language (OWL) design it tends to be gotten too. To order the records that put away in database it utilized the Meta information demonstrating. To delineate contribution to yield information this model can undoubtedly help.

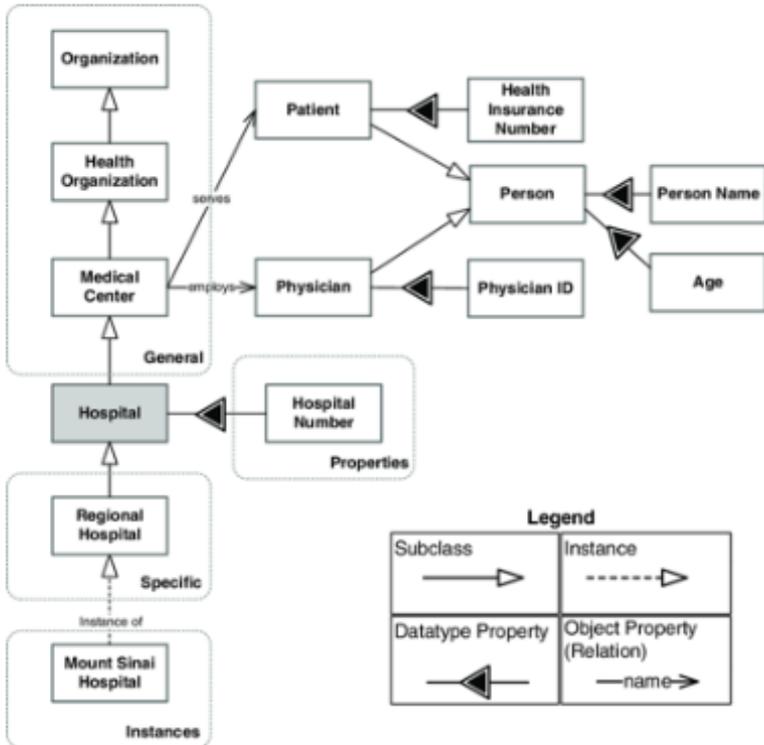


Figure 5: Ontology Based Systems in HealthCare System Example

VIII. IN HEALTHCARE NEED OF ONTOLOGY BASED SYSTEMS  
The utilization of ontologies in prescription is fundamentally focussed on the reorganization and representation of terminologies of medical. To help communicate and store patient-related information and general medical knowledge efficiently the physicians implement their own specific lexicons and languages. By a significant amount of implicit knowledge for human processing these terminologies optimized. on the other hand medical information systems need to be able to communicate detailed and

complex medical concepts unambiguously. This is clearly a troublesome undertaking and requires a significant investigation of the structure and the ideas of restorative wordings. Be that as it may, it very well may be accomplished by building therapeutic space ontologies for speaking to restorative phrasing frameworks.

In the Medical Natural Language Processing area it also made the Ontology-based applications [16].

Some benefits of Ontology Based Systems are as follows:

1. For different purposes to support different statistical aggregations the Ontologies can also provide - criteria that is based on semantic.
2. In healthcare to develop more interoperable and powerful information systems the ontologies can help.
3. The ability to support the indispensable integration of data and knowledge is the most important benefit of data.
4. To share, re-use and transmit the need of healthcare process supported by Ontologies.

## IX. CONCLUSION

The theory of object is its relationship is considered as Ontology. In information science and computer science the ontology encompasses a definition, representation and formal naming of the relations, categories and properties between entities, concepts and data that substantiate all, many or one domains of discourse. The theory of object is its relationship is considered as Ontology. To restrict and regulate the disclosure of data in health care the access control mechanisms used. From multiple heterogeneous sources to effectively combine information or data the Ontology-based data integration include the utilization of ontology.

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