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Analysis on Ontology and Semantic Web Technique in Education

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Abstract: Semantic web technologies would heavily rely on formal ontology in order to structure data, thus the data provide comprehensive and transportable understanding of machine language. Ontology which serves as metadata scheme that provides a set of vocabulary concept. Ontology would provide an important role in modelling education platform. Thus in this paper an analysis on education platform using ontology and semantic web technique is studied.

Keywords: Ontology; Semantic web technique; Web intelligence; Business intelligence; Big data; Higher Education.

I. INTRODUCTION

As per the study in [9] usage of web intelligence in education has significantly increased from the last few years. These significant changes had happen due to the increase of scholarship given, for the wellbeing of an economy, and the general mentality of public such that they could enroll for the higher education and improve their chance for being in job market.

Even though such improvement has come into existence still there are few circumstances wherein grades are not valid. Hence it is necessary to identify such problem and overcome it by maintaining a good relationship between teachers and the student. In order to do this various business intelligence tools, big data analytics have been used.

A. Web Intelligence

In the early 90's when the internet and world wide web had the flourshiment of web information was drastic and the growth of web based information and web pages and overloaded.

Hence in order for the business management make their tool make their right decision it was necessary to have deep understanding about the data and their process which was named as web intelligence. By using web intelligence it make the business analyst to use the web based tools and business intelligence technique to achieve their goals.

B. Ontology

Ontology basically describes the concepts and relationship between communities. A concept in ontology can be a person, place or thing. The relationship in ontology describes a way in which each two things could connect each other. There are some terms which are used in ontology which can be described as

i) *Class*: Class sometimes can also be termed as concept in ontology which is a way to represent the qualities and properties of group of object.

ii) *Subclass*: I represent a part of group in which the whole is not common from the group.

iii) *Individual*: It is a single term which belong to some class or can also belong to m many class.

iv) *Property*: It describes the common properties of individual in a class.

v) *Property Restriction*: property restriction which gives some common property and restrict to cardinality and value restriction.

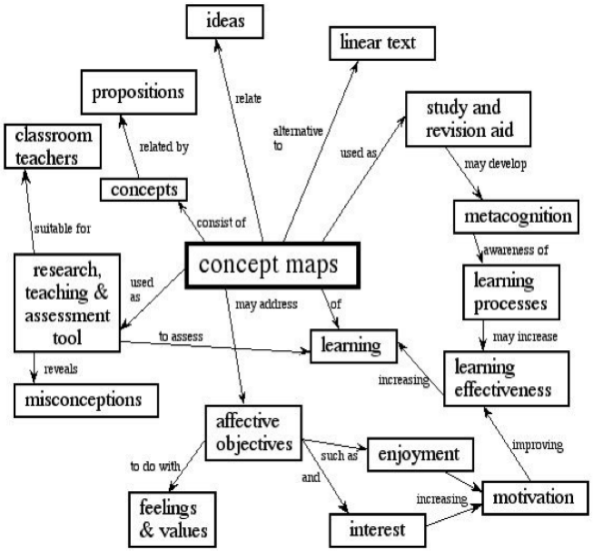

Fig 1. Represent an ontology model

C. *Semantic Web*

Semantic web which is an extension for World Wide Web promote the data formats and the protocol exchange on the web. According to World Wide Web the semantic web provide a mutual framework which allows to share data and to reuse among application.

D. *Business Intelligence*

Business intelligence which comprises of strategic and technologies are used by the organization for analyzing data and business information. The main aim of business intelligence is to allow an easy interpretation of these big data which identify new strategic based on insight to provide long term stability among in the market.

II. ONTOLOGY IN EDUCATION

Ontology provides a standard method in which the knowledge representation of it is endless. The terms ontology is derived from the Greek philosophy which represented an area in metaphysics which concise with defining the most general items and which represented a course of entity [7].

Ontology play an important role in upcoming of agent a communication and also it provides the way for development of semantic web. Semantic web can be defined in terms of its name which provides an additional level of meaning hence the computer programs can be easily manipulated and hence become easy for humans.

The educational institution found the use of semantic web in terms of its benefits. It paves for people to access things easily and hence they can be benefitted. They offer way to personalize their content which provides a well mannered knowledge database.

Both ontology and semantic web offer a novel way of e-learning by providing subsequent concepts and also provide a sequencing method which provides student solution. The functionalities include:

- Building a structured model by collecting data about the student and their interest.
- Giving a course detail with proper annotation and sequences from the collected data.
- From the student data analysed and hence find the interest and generate the curricula
- Monitoring each student such that the identification of dull and excellent student can be noticed.

III. EDUCATIONAL ONTOLOGY

Educational ontology talk about the binding mechanism in the element it contain. The ontology based educational system represent the relationship among the core components in a web learning system which are used in virtual university [7].

The initial step in educational ontology is to find the specific domain in ontology such that it represents the education entities those are the teachers, students, universities allocated, and the lecture.

The elements that required for e-learning methods are functional and provide a live model which includes the following:

- Users are divided according to the role they play like the teachers, students, and admin.
- The methods in learning are structured based on the difficulty and the level involved in the learning process.
- Acquired knowledge are put into use by practice and through projects, such that aim to stress on few important topic.
- Evaluation of level of understanding certain topics can be determined by certain activities

Ontologies are built using certain structure and level of context which are the class, individuals, relations and restrictions.

IV. RELATED WORK

Representing the mechanism to find and integrate the learning collaborative elements is a practical way. It uses efficient different paradigm to integrate the ontological methods to provide and identifying the ideas such that it give rise to a set of common meaning of words for collaborative learning and to provide the framework and hence organize the ontology and this provide conceptual structure that define and construct CSCL environment[1].

[2] Business intelligence has become an effective means in making the decision in organization. As the business intelligence indicate to all the user that appropriate metrics and queries which help of result could be studied and analyzed in order to improve the decision making in the system.[3] discuss how the rise of business intelligence and the usage of other technique could help in becoming a competitive to higher education environment.

A new student relationship management system was developed with business intelligence system. The system would collect the data about the behavior of staff and student and hence determine their academic behavior [4]

As the principle provider of the workforce to the business, advanced education is progressively censured for not being side by side with the computerized transformation and being disengaged from the business. Competency-based training was created to address this issue and cross over any barrier between what the college is delivering also, the necessities of the business.

Consequently, devices should be built up that aids the examination procedure. paper propose a framework that models the capabilities required by occupations in the industry and advanced education educational program and helps with coordinating profiles from the two spaces. The unique ideas in the space are demonstrated as a semantic web philosophy, and an induction motor plays out the profile coordinating [5].

In the paper[6] displayed a system which permitted to acquire a reasonable knowledge on the web based life utilization of one specific area, the Higher Education Sector, and how the online life action identifies with the association's the same old thing targets. The web-based social networking technique investigation drives to infer that Middlesex University Mauritius Branch Campus is increasingly engaged towards advertising itself on the web and keeping up its notoriety, and less so on other significant business zones, Research and Education, which are significant business systems. This exploration was gone for revealing some insight into how one specific association can adjust its business destinations to its internet based life nearness. The investigation delineated which territories of its general business vital arrangement are as a rule increasingly connected continuously on its social media stage, consequently helping the college to improve its web based life nearness in order to cover all parts of its vital plan, nearby building up a viable and explicit social media key arrangement.

The educational ontology in this paper is used to show online e-learning frameworks for advanced education. The objective was to make space ontology to play a significant job in speaking to advanced education ideas and to help specific e-learning frameworks. It is focused on the need for creating instructive models that meet the desires for advanced education network with respect to e-learning adjustment and effectiveness by utilizing ontologies and Semantic Web procedures [7].

In this examination a space ontological model is introduced as help to the understudy's basic leadership for chances of University thinks about dimension of the University Lumiere Lyon 2 (ULL) training framework. The cosmology is planned and made utilizing methodological methodology offering the likelihood of improving the dynamic creation, catch and information explanation [8].

The motivation behind this paper [10] was getting a superior appreciation of the advantages and the burdens of actualizing this sort of frameworks to improve the way that learn and instruct. In light of this fundamental objective and thinking about that a straightforward examination of a standardized database isn't adequate; a Web Intelligent System (WIS) was planned.

This sort of execution permits the assessment of a lot of information, with a ton of incongruities, a large portion of the time, which could be all the more effectively broke down with the assistance of the instruments, provided by these frameworks. This investigation was directed with a test of in excess of 133 students that went to the course of Web Programming, in MiEGSI in University of Minho. With the WIS, it was conceivable to comprehend the fundamental reasons that lead to progress or maintenance in training, the figure 2 shows the process to create web intelligence system.

V. CONCLUSION

Semantic web technologies would heavily rely on formal ontology in order to structure data, thus the data provide comprehensive and transportable understanding of machine language. Ontology which serves as metadata scheme that provides a set of vocabulary concept. This paper focuses on the various methods that are used in e-learning with the help of ontology and semantic web.

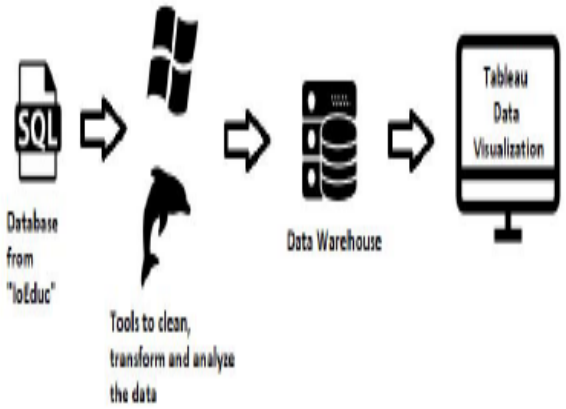

Fig 2. Process of creating web system

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