

Modeling on Personalized Web based Collaborative Learning in Web 3.0

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Abstract

Web 3.0 is an extension of the current web environment. Information in web 3.0 can be collaborated and communicated when queried. Web 3.0 architecture provides an excellent learning experience to the learners. Web 3.0 is 3D, media centric and semantic. Web based learning has been on high in recent days. Web 3.0 has intelligent agents as tutors to collect and disseminate the answers to the queries by the students. Completely Interactive learner's query determine the customization of the intelligent tutor. This paper analyses the Web 3.0 learning environment and suggests a model for Personalized Web based Collaborative learning.

Keywords: E learning, Web 3.0, Semantic Collaborative learning, Modeling, UML, Sequence diagram.

Introduction

Web 3.0 is an evolving elongation of www, in which the information can be shared and interpreted by other software agent to find and integrate applications to different domains.

Web 3.0 provides integrated real time application environment to the user. The applications are involved in searching using semantic web, 3D web and media centric web. Web 3.0 supports pervasive components. Each component and its relations are represented below.

In web 3.0, web is transformed into database or Data Web wherein the data which are published in the web is reusable and can be queried. This enables a new level of data integration and application interoperability between platforms. It also makes the data openly accessible from anywhere and linkable as web pages do with hyperlinks.

Data web phase is to make available structured data using RDF. The scope of both structured and unstructured content would be covered in the full semantic web stage. Attempts will be to make it widely available in RDF and OWL semantic formats.

The driving force for web 3.0 will be artificial intelligence. Web 3.0 will be intelligent systems or will depend on emergence of intelligence in a more organic fashion and how people will cope with it. It will make applications perform logical reasoning operations through using sets of rules expressing logical relationships between concepts and data on the web. With the realization of the semantic web and its concepts web 3.0 will move into Service Oriented Architecture.

The evolution of 3D technology is also being connected to web 3.0 as web 3.0 may be used on massive scale due to its characteristics.

Web 3.0 is media centric where users can locate the searched media in similar graphics and sound of other media formats.

The pervasive nature of web 3.0 makes the users of web in wide range of area be reached not only in computers and cell phones but also through clothing, appliances, and automobiles.

Learning process in Web 3.0 is a highly sophisticated for the learners. The learners have access to the unbelievable knowledge source. The tutors are intelligent agents who are customized for the learners.

Web based learning-The current scenario

Web based learning is the acquisition of knowledge with internet as a media. The current web environment is on the transition state between web 2.0 and web 3.0. The Earlier Web based learning process was instructional. Using the internet technologies the students acquired knowledge. In Web 2.0 the learner is powered by the social softwares like blogs, wiki's, podcasts and virtual worlds. The value addition of social software has made the learner to be participatory in the learning process. Social networking software's are participatory knowledge acquisition phenomenon which shares the knowledge of the society.

A typical environment of learning in Web 2.0 is read and write. The primary participants are learner and a tutor. The learner can be an active participant in the social networking sites and acquire knowledge. When the learner opts for undergoing classes in a particular topic, he learns from the static knowledge of the tutor which are programs. It includes static contents and the learner can ask questions and answers if supported by the programs will be displayed. The tutors look and appearance is 2D.

The main disadvantage of personalized learning in Web 2.0 is although the environment is participatory, it is static and predefined.

It does not include the collective knowledge of current advancements in the topic. The interface is simple to use. The Learner can have only limited queries. The dissemination of knowledge by the tutor is determined by the developer.

Technical background of Web 3.0

Web 3.0 architecture makes the learner sophisticated. Resource Definition Frame

work (RDF), SPARQL, WebDAV, site Specific API's FOAF and SSL are the components of Web 3.0

A meta data data model component of web 3.0 is RDF (Resource Definition Frame work). RDF represents the data in a labeled directed multi-graph format which in useful in assigning meaning for the data. Any universal conception can be represented in triplets

[Subject Predicate, Object]. Resources of a concept are indicated by subject, A distinguishing feature of the resource is indicated by predicate. It also indicates the relationship between subject and the object^[1]. In web 3.0 Personalized learning is accomplished by associating the queries by learners and the knowledge of the tutor together with the available web resources in RDF format so that the query can be associated with the knowledge.

SPARQL protocol for RDF query language process query which consist of triple patterns, conjunctions disjunctions and optional patterns. SPARQL facilitates personalized web based learning in web 3.0 by accepting patterns, multiple queries and complicated queries by the learner^[2]. It also empowers the intelligent agent tutor to collaborate multiple web resources into meaningful and understandable text and visuals of the learner.

Web-based Distributed Authoring and Versioning (WebDAV) is used for revising and supervising the documents and files stored in World Wide Web servers. The methods in WebDAV imparts protocols which does locking (overwrite prevention), properties (creation, removal, and querying of information about author, modified date), name space management (ability to copy and move Web pages within a server's namespace) and collections (creation, removal, and listing of resources)^[3]. In Personalized collaborative environment WebDAV assists the intelligent agent tutor to interact with the web servers to collect and produce cognizant knowledge to the learner.

Site specific API's interacts with the RDF and produces required output of the learner. Site specific API's provides the functionality to the learner by making the query understandable to the tutor in precise form. It supports the intelligent agent tutor to interact with the web data resources in world wide web servers to collaborate the data^[4]. Site Specific API's are useful while modifying the existing personalized learning web sites of web 3.0 so that the functionality can be reused and remixed again.

FOAF+SSL is a decentralized secure authentication protocol using the FOAF profile information and SSL security layer. It makes ease the role of the intelligent agent tutor in web 3.0 by maintaining FOAF cloud of the persons activities their relations to other people and objects^[5]. The intelligent agent tutor of web 3.0 need not maintain a centralized machine readable ontology. The security issues are maintained by SSL.

The aggregation of these components is utilized in the personalized collaborative learning of web 3.0.

Technology plays a vital role in all aspects of personalized learning. The technologies which are utilized in personalized collaborative learning includes Artificial intelligent, Automated reasoning Cognitive architecture Composite applications Distributed computing, Knowledge representation, Ontology, cloud computing, Grid computing, Scalable vector graphics, Semantic web, Semantic WiKi and Software agents.

Personalized collaborative Learning in web 3.0

In web 3.0 the two major components are the learner and the 3D tutor. The learner is the human who intends to acquire knowledge about a specific subject. The tutor is an intelligent agent which delivers the collective knowledge to the learner.

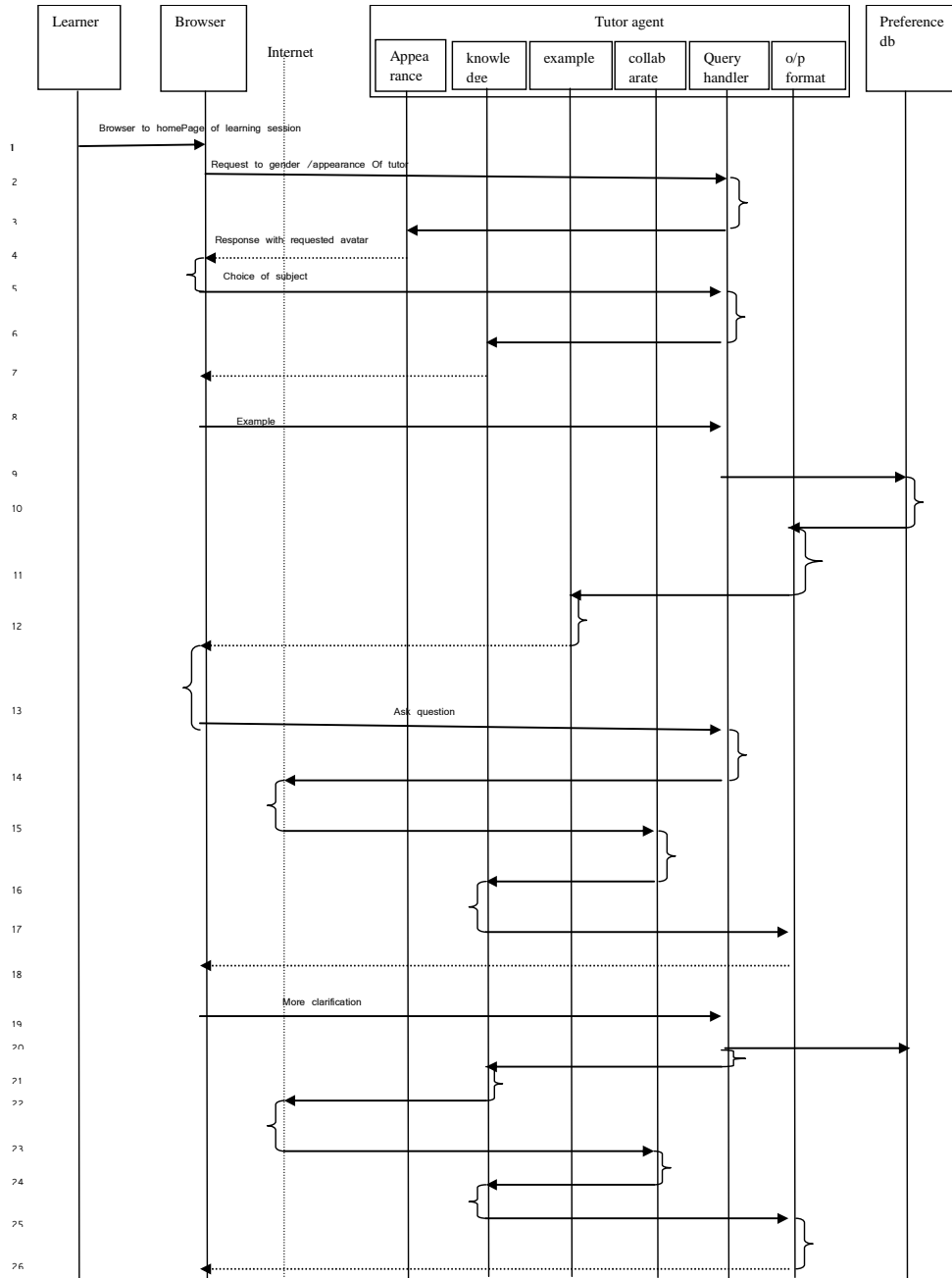
The learner initially starts to take up the tutorial. The learner specify the tutor's look. He can specify the gender of the tutor. The look or avatar of tutor can also be specified by the learner. During the learning session, the learner must be completely interactive. His interactive queries interpretations and examples defines the intelligence of the tutor. The learner can request more examples working 3D models clarifications, justifications, applications at any point of time. The output can be audio, video, 3D, or text as opted by the learner. It can be a combination of the output formats also depending on the preferences of the learner. The learner can demand aggregations and mash up of websites based on the topic. He can have choice of collaboration of best web resources and technologies available till date.

The tutor's look is specified by the user. The tutor intuitively asses the intelligence of the learner. Based on the intelligence and personal preferences of learner the tutor must deliver the knowledge. The tutor must collaborate knowledge from various web resources filter the irrelevant knowledge and share it. The tutor must give outputs according to the personal preferences of the learner and also prefer the alternative output form if one type is not sufficient. It must understand the language of the learner and interact accordingly. The agent must aggregate the web resources required by the learner which is updated till date. The technologies and tools used must be the suitable by analyzing all the till date available technologies and tools.

UML Modeling for Personalized collaborative learning in web 3.0

A model is an abstract representation of a system, constructed to understand the system prior to building or modifying it. Building a model for a software system prior to its construction is very essential. The unified modeling language is a language for specifying, constructing visualizing and documenting the software system and its components. UML sequence diagrams is intuitive way of describing the behavior of a system by viewing the interaction between the system and its environment. A sequence diagram shows an interaction arranged in time sequence. A sequence diagram is constructed for developing personalized web based collaborative system.

UML sequence diagram for Personalized Web based Collaborative Learning in Web 3.0



Conclusion

The next generation learning is personalized collaborative web based learning. Web 3.0 architecture facilitates extensive support to the learner requirements. This paper proposes a UML based modeling for personalized learning in Web 3.0.

Future work

The model proposed in this paper can be an initiative for the design and development of personalized web based learning applications in Web 3.0.

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