



IJIRCCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 9, Issue 3, March 2021

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 7.488

 9940 572 462

 6381 907 438

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 www.ijircce.com

Semantic Web-In a Future of e-learning Collaborating with Recommenders System

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ABSTRACT: Recent advances in web-based learning technology offer a variety of educational materials available to people. However, the increase in accessible materials confuses the choice decision. A support system based on learner requirements, backgrounds, and user preferences is needed to help effectively search for preferred materials.

Technologies for improving education have always been used and always new technologies first through education, especially with information related to emerging computer technology. Network education (including distance education, distance learning), or e-learning with the growth of computer networks. It resulted in wireless and mobile computing in education or mobile learning. Semantic Web-based recommendations are necessary for advanced recommendations in times of information overload on the web. Context data can be used not only to represent domain objects and learner preferences in a more accurate and enhanced manner, but also to apply better matching methods using semantic similarity measures.

I. INTRODUCTION OF SEMANTIC WEB

The Web was anticipated as an information area, with the reason that it should be profitable for person to person correspondence, as well as those machines would probably interface and help. Semantic web be a work of information which is related with the intention that they perform a greater amount of the monotonous works engaged with discovering, sharing and consolidating data on the web. [1] For instance: a PC may be told to list the costs of Refrigerator under 70 creeps with darker shading at shopping complex in the closest town that are open until 10pm on Saturday nights. This pursuit will never furnish important data to client with customary web, yet it very well may be conceivable with semantic web.

The Web 3.0 is a growing addition of the current web in which the semantics of data and administrations on this muddle is characterized, making it doable for the web to recognize and satisfy the necessities of individuals and machines to utilize the Web content. It gets from W3C chief Tim Berners - Lee thought of the Web as an across the board standard for information, data and learning trade. [1]

The primary principles of the semantic web incorporates asset depiction system for speaking to information as triplet, Uniform resource identifier for interesting ID of the subject, predicate and object of the triple and owl is utilized for improving the ideas and the connections between those ideas. At last, SPARQL is utilized for inquiry preparin g.

URI (Uniform Resource Identifier) used to identify the item on web and the identified item is called "resource". URI is of two types one for location called URL(Uniform Resource Locator) and the another one for number is called URN (Uniform Resource Name) RDF is the data modeling language used in semantic web it represent all the data in triple format. RDFs are the data typing model of RDF. SPARQL is an inquiry dialect it is expected to address data transversely over various structures. Web Ontology Language or we can say in information portrayal dialect utilized by semantic web to speak to the ideas and the connections between them.

For developing a smart education system, we need to work on semantic web because it make the overall things of we can say everything on web become intelligent. For integrating smart learning data, we first need to work on volume, variety and velocity of data. Secondly, the privacy of individual data requires data abstraction.

a.Semantic web intermingled with recommender system-

Content-based filtering systems generate recommendations that compare user preferences (expressed either implicitly or explicitly) against metadata or characteristics used to represent resources or products, while ignoring information about other users [4].

The Semantic Web can provide more flexibility in e-learning systems by new, emerging Semantic Web technologies and a recommendation system. personalized learning material is commented semantically. For a new learning

requirement, it can easily be combined in a new learning course. Recommendation systems use ontology, among other techniques, to provide personalized recommendations.

II. STATEMENT OF PROBLEM

Various relevant issues in including Semantic web as background of data involves dealing with the challenges like:

- Conversion of dumb data into smart linked data
- Ontology accessibility, expansion and development
- Scalability of Semantic mesh Content
- Security and Privacy
- Availability of content
- Multilingualism
- Volume, variety and velocity

III. LITERATURE REVIEW

S.No	Title of the Paper	Author & conference	Year
1.	Student classification based on cognitive abilities and predicting learning performance using machine learning	<ul style="list-style-type: none"> ▪ K sangeeta ▪ T panduranga Vital ▪ Kalyanakirankumar ▪ IJRTE scopus journal 	2020
2.	A Survey of the First 20 years of research on semantic web and Linked Data	<ul style="list-style-type: none"> ▪ Fabien Gandon ▪ HAL-Inria 	2018
3.	Inference based user's Recommendation in E-learning	<ul style="list-style-type: none"> ▪ Youssef Elouahby ▪ Rachid Elouahby ▪ Society of Science & Education UK 	2017
4.	Viewpoint A new look at the semantic web	<ul style="list-style-type: none"> ▪ Abraham Bernstein ▪ ACM Journal 	2016
5.	Smart Cities based on Web Semantic Technologies	<ul style="list-style-type: none"> ▪ Tarek ABID ▪ HafedZabzour ▪ ACM Journal 	2016
6.	Semantic Feedback on Student's performance with data mining techniques	<ul style="list-style-type: none"> ▪ J Naren ▪ Vaishnavi Raghavendra ▪ IEEE Conference 	2016
7.	Smart City Architecture: Vision and Challenges	<ul style="list-style-type: none"> ▪ Narmeen Zakaria ▪ Jawwad A. Shamsi ▪ IJACSA 	2015
8.	Semantic Modeling of Smart City Data	<ul style="list-style-type: none"> ▪ Stefan Bishof ▪ Amit P.Seth ▪ Core Scholar Wright state university 	2014
9.	Knowledge-based Data Mining Using Semantic Web	<ul style="list-style-type: none"> ▪ Sumaiya Kabir ▪ Shamim Ripon ▪ Elsevier 	2014

10.	Knowledge-based Data Mining Using Semantic Web	<ul style="list-style-type: none"> ▪ Sumaiya Kabir ▪ Shamim Ripon ▪ Elsevier 	2014
11.	Semantic Web Query on e-Governance data and designing ontology for agriculture domain	<ul style="list-style-type: none"> ▪ Swaran Lata ▪ Bhaskar Sinha ▪ Semantic Scholar 	2013
12.	The Semantic Web revisited	<ul style="list-style-type: none"> ▪ Nigel Shadbolt ▪ Wendy hall ▪ Tim berners Lee ▪ IEEE Journal 	2006

IV. RESEARCH QUESTIONS

- In this study we specifically ask:
 - 1) What are the main uses of ontology in e-learning systems?
 - 2) Finding out the various applications of Semantic ontology-based learning environment?

V. PROPOSED METHODOLOGY

Using this technique, the system also provides a path to complete the course material efficiently and proper personalized recommendations to learners guided them to focus on their weak area and provide related resources so that they can improve. Because many learners face problem while studying for examinations, so if we provide a recommendation by analysis their pattern of studies marks obtained and feedback by teacher so, this system can easily provide a meaningful solution to all learners. For analysis, we are using K-means clustering algorithm in R-Tools.

First step is to identifications of slow learner and advance learner, on the basis IQ test, scores and teachers rating. In second step, we categorized learners in two clusters one for slow learner and the other one is for advance learner. In third, the system will provide ontology-based content and in the final stage model provide personalized semantic recommendation to learners. Personal assistant is provided to learners according to their choices. Proposed model shown in below figure.1.

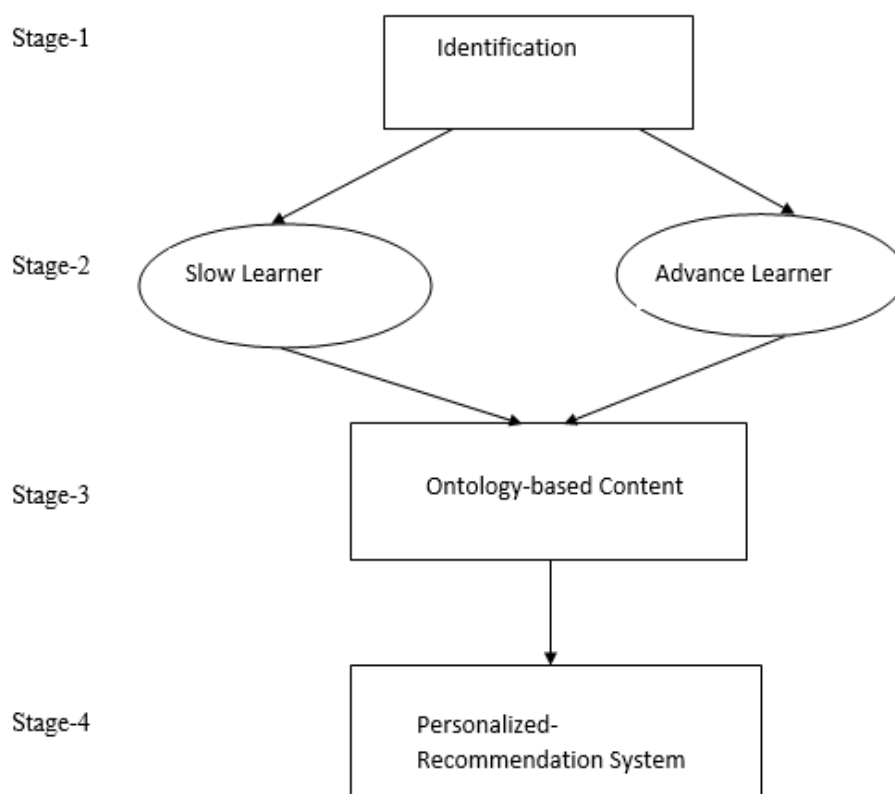


Fig.1 Model of Semantic Recommendation System

Our Vision is to overcome these challenges and implement a semantic descriptive model to improve data discovery, indexing and query smart city data.

- We first focus on volume, variety and velocity of data.
- Developing a smart data by combining physical, cyber and social data.
- E-learning methods different for slow learners and Advance learners.
- Need to individualize and Flexible.
- Our objective to exploit the recent advances in Semantic web to address issues concerning teaching-learning system, consequently leading to a smart learning environment.
- Ontology based e-learning.
- Personalizing learning content recommendations.
- Categorizes the learners in specific interest areas using semantic web
- We are creating a module that provides a way to efficiently complete the course material and appropriate personalized recommendations for the learners to guide them to focus on the weak point and provide related resources so they can improve.

VI. CONCLUSION

Semantic web is the newer version of Web. To cope efficiently with the daily rising of information that becomes available in WWW the evolutionary step towards the machine-understandable Semantic Web was proposed. Ontology is the backbone of the Semantic Web. Research on ontologies generates a number of languages for ontology illustration, stable keystone theory, provided various useful assumption engines and created various ontology management tools. However, we need this technology for improving the quality of service in e-learning platform by combining it with personalized recommendation system. We proposed our work to remove the drawbacks and designing a web of college by following semantic webbased education inculcated with RS approach try to encode the information of students, faculty and library etc.

Future scope- In future, we try Implement virtual reality based education system for this pandemic situation and this virtual reality based system also provide special education for physically disabled learners.

Society of Science & Education UK

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