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Analysis of Challenges in Migration from Web 2.0 to Semantic Web (Web 3.0)

Ravi Ranjan[1], Nayan Uchhana[2], Tripty Singh[3], Viplove Divyasheesh[4]
[1, 2, 3]*B.Tech Student,* [4] *Assistant Professor, Department of Computer Science, IIST Indore, Indore, India*

Abstract: ***The term "Semantic Web" refers to W3C's vision of the Web of linked data. Semantic Web technologies enable people to create data stores on the Web, build vocabularies, and write rules for handling data. Linked data are empowered by technologies such as RDF, SPARQL, OWL, and SKOS.***
This paper effectively presents and analyses the varied challenges that pose in migrating from Web 2.0 to Web3.0. As the ultimate goal of the Web of data is to enable computers to try and do a lot of useful work and to develop systems that can support trusted interactions over the network. But the same transition poses many challenges in actual scenario,which will be analyzed by us in this paper.
Keywords: Semantic Web, RDF, OWL, Web 3.0.

1. INTRODUCTION

The expansion of the web has led to a new version of the web called web 2.0 also known as the social web. Web 2.0 term was proposed by Darcy DiNucci in 1999 and later advanced by Tim O' Reilly and Dale Dougherty at O' Reilly media web 2.0 conference in late 2004. Web 2.0, is an upgrade version of web 1.0 which indicates especially by the change from static to dynamic or content developed by the user, and also the expansion of social media.

Semantic web is also known as web 3.0, is an expansion of web 2.0. semantic web (web 3.0) was proposed by John Markoff of New York Times in 2008, called as the third-generation internet-based services that may be effectively considered as the intelligent web. Some technologies used in the semantic web are (i) XML (ii) RDF (iii) SPARQL. It is like challenges for present world to adopt it only because it is complex but it brings up the major change in normal world. semantic web can change our lives with the application of these four features. E.g.: — Google map, Amazon.

But to adopt the change we are going to face following challenges

A. It does not have a privacy policy that needs to work.
B. It removes the data if the user is not active.
C. Personal/private information can be easily recognized.
D. A large amount of data can be crashed and can give unpredictable results.

So, to deal with challenges we are going to approach two new technologies and making them to work together that is machine learning and AI (artificial intelligence). That are going to help us vanish the challenges faced in the migration of web 2.0 to web 3.0.

II. LITERATURE REVIEW

Semantic web is an upgraded version of web 2.0 in which data in web pages are created in such a way that it can easily understand or read by the computer.

[8] "the main added value of such the extended web is standardization of a way of expressing the relationships which allows computer to understand the information and process it in a way commensurate to it meaning".

[2] "semantic web will maintain more professional discovering computerization and reuse of data and offer some support for combinational problem that cannot be solved with existing web techniques".

As semantic web is combining with AI in order to give relevant result. [8] "In semantic web, software can be made to understand the meaning of webpages by adding 'metadata' to web pages". Such type of system is developing were results can be calculated using data and ontologies to give reply automatically.

As availability of contents is less in semantic web, we can resolve this problem as [10] "we need to create a set of annotation services (middleware) concerning static and dynamic web documents, which may include multimedia, and web services. The output

of these annotation services will be generated according to the language pyramid of the semantic web, so that the different agent understanding different languages of the semantic web might always understand and handle as much content as might be represented in the different language".
Semantic web is considered as the interactive web sites for computers.

III. DIFFERENCE BETWEEN STRUCTURED WEB AND SEMANTIC WEB

Structured web / web 2.0 (2000-2010) basically read-write web is considered as the second generation of web where both clients as well as server has the opportunity of adding/deleting and can also modify the content in the given web page. E.g. social media(twitter) blogs, social bookmarking sites. It provides link which enable their client to link their websites to their profile and bios. Also work as traffic which help to generate large number of users for the websites because each website has many users and communities. Web 2.0 work on XMD, RSS technologies.
Semantic web / web 3.0 (2010-2020) basically read-write-execute. web is considered as third generation of web. Web 3.0 aims to create more open , connected and interactive websites, with semantic web technologies, natural processing language, machine learning, machine to machine communication etc. in this computer can interpret information like human and give smart result according to the need of the users. Web 3.0 can transform web into a database. Web 3.0 are google map. Technologies included in web 3.0- RDF, XML, SPARQL, OWL etc.

IV. CHALLENGES IN MIGRATING TO THE SEMANTIC WEB

Every opportunity brings a new challenge with it. So here are the challenges that we are going to face from migrating web 2.0 to web 3.0

A. The development of Ontologies

When we focus on Semantic web which actually means what is the real meaning of "anything" hastily. To make web understand more clearly, we need to develop the idea of ontology. Basically, ontology term means existence of science or study. There are main three problems with ontology development. i) kernel ontology ii) ontology development process iii) evolution of annotated data. We need to work on these three areas of ontology to make it more effective web. As we progress in ontologies the web will be able to understand the relations between the classes and can answer to more complex types.

B. Availability of the Content

The content storage and content retrieve are the another most important issue for web because once we shift to semantic web, we will be able to get the results so easily even though we use the most complex way of requesting a query. At present the content on internet is present in different forms that means to retrieve it in systematic way we need to make some changes in present system to over come the issue of availability.

C. Semantic Web Languages Standardization

The semantic web is an evolving field, yet we are not clear about its exact definition and for it the guidelines of technology will be generated by the WWW consortium. Also, it will require some tools to build the semantic web that will work with the web dependently. Semantic web will be an advance technology for which we need to make major changes in present system for web.

D. Visualization

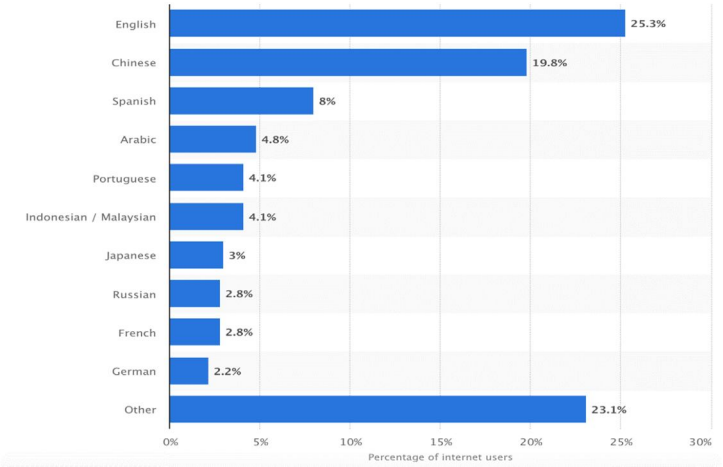
Well here comes another challenge related to content that with time we are getting more data day by day to analyse that data we need to visualize it. The demand of relevant data and recognition of data present on internet is useful for organizations and researches so for that we need to come up with new idea of visualization and replace the linking structure of traditional site mapping technique with new.

E. Latency Issues

It basically refers to the censorship resistance of an application. Today we either have open source platform application without earning or earning without open source but with semantic web we can create an application that will be open source plus earning. Also, to make an application with these two features we need to have more censorship resistance which is a big challenge because if we increase the censorship resistance that will automatically lead to decrease in speed, cost, scale.

F. Multilinguality

It is an issue for everyone using web it is about the different use of languages on web. Mainly there are three level of it. i) At the level of ontologies ii) Annotations iii) User interface if we look at the present scenario of languages used on the web. These are the top 10 languages of 2020 which are used on web mostly. (speakt.com)



At the level of ontology, the builder of web wants to have their own native language to use because that is going to be convenient for understanding the term and languages more easily.

The annotations are needed to have proper language supporter because it creates a demand for special provider of content. We need to convert the language to understand it more effectively.

G. Economic Impact

The major issue we can observe in present world is that companies and organizations are having the full control over the people's life and their data (email, phone no, name etc). The companies and organizations have their own ecosystem in which they use the data of individuals.

Basically, the economic is at shrinking stage because most of the market is owned by the big companies so to break the rule of shrinking economy, we have to shift towards semantic web that will create a path for new business models to come up in market and run on large scale.

H. Proof and Trust

It is said that web is a platform for free say of people. That divert our focus on the other side of issue that is very common. The webs are used by common people so to make anything useful to them we need to create a layer of trust about the new technology arriving in market so that they can come up with the idea of change and have trust on new technology.

V. SUGGESTED SOLUTIONS

Here are some of the hypothetical solutions suggested by us on a conceptual theory research basis.

A. Since the research and development are still on the developing stage but with that, we have some solutions to the challenges which are mentioned above.

B. If we shed some light on the content availability all the content available on the internet are in the form of HTML file, text contents, dynamic content, multimedia etc which need to upgrade at every interval of time so that they can be accessed and maintain easily.

C. For ontology development we need to create a configuration tool which will keep the track of dependencies and relation with the annotations.

D. Also, we need to create special tools for Multilinguality that was another challenge for us that will easy vanish the need of special content provider. As to provide a solution to it

E. We cannot pick one approach or one technology to work on it, we need an innovative idea for which we have the idea of using artificial general intelligence (AGI) with block chain because when we think of AGI it has its own control system, sensing sensors, internal forward mechanism etc.

F. When we let the AGI to learn from its own environment that is through reinforcement learning it will start behaving like a live web or say "living web" also it is not possible by our system AI that is actually controlled by a server so for that we need blockchain that will create a decentralized server system where we will have the multiple server with a high security system so even when anyone tries to hack it get shut down completely and user can switch to another server.

G. Here if we keenly observe we can link both AGI with blockchain so that AI gets resource like it doesn't depend on any central resource and blockchain will get the missing link autonomous decision-making so that they can work together.

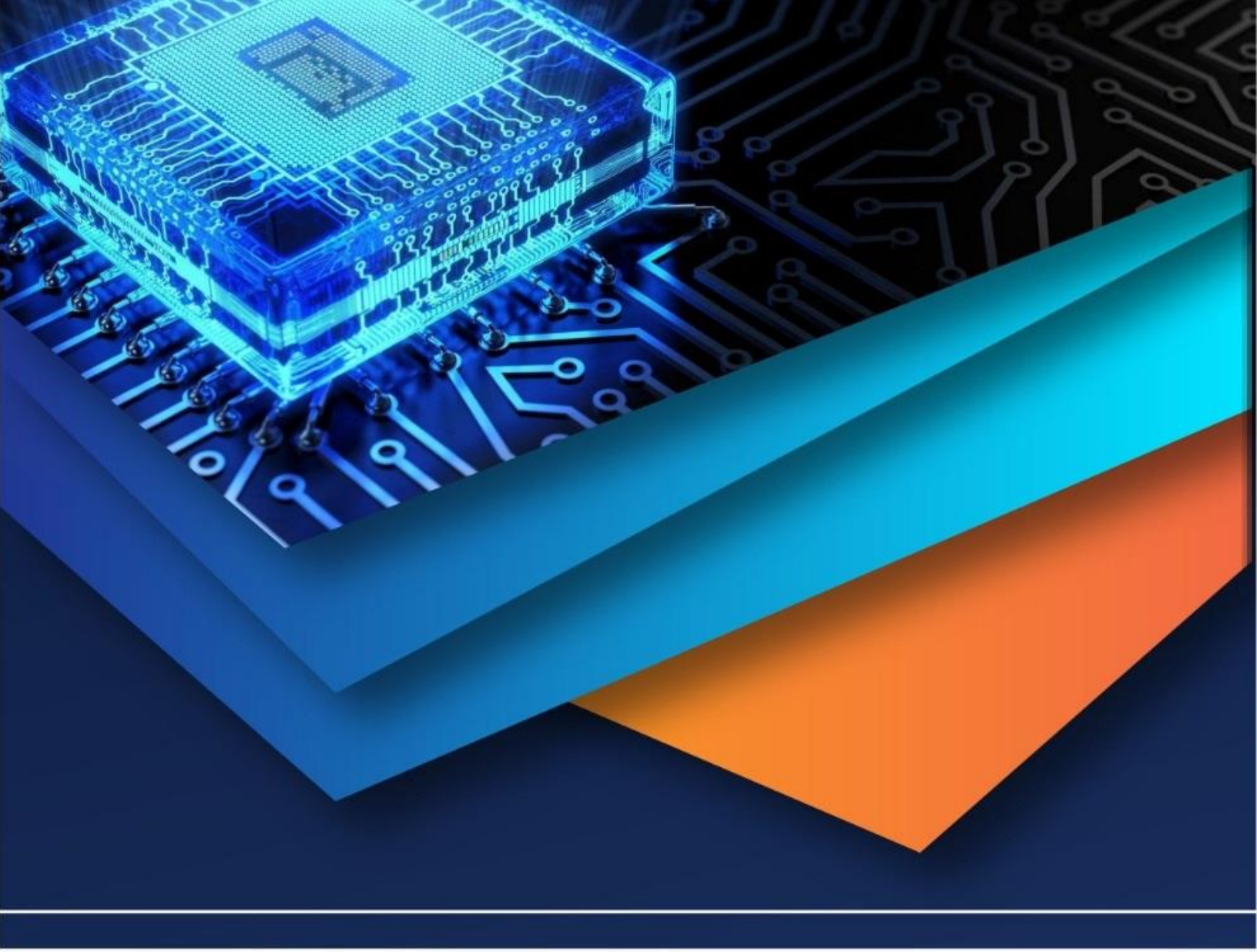
H. As a result AGI can visualize the data in more than one dimension such as 2D, 3D and by learning from its environment it can solve the problem of multilinguality it can collect the data in many languages even without applying too much effort and since we are going to use decentralized system (blockchain) it will gain the trust of common people and with it new start up can be helped to come up and run their market because it will end the idea of shrinking economic.

VI. CONCLUSION

In this paper we came to know about the semantic web and its application in various fields . We proposed solutions for different challenges that we are facing while moving from web to semantic web . We focused on the main problems - content availability , development of ontologies , multilinguality and many more. Future development is possible in the area of Decentralization , inferences and privacy restraints. One can also go for implementation and modifications of various schemes suggested in the paper.

BIBLIOGRAPHY

[1] Karan Singh*, Anil kumar, Arun Kumar Yadav -IJESRT || "SEMANTIC WEB MINING: ISSUES AND CHALLENGES"- August, 2016
[2] M.M.El-gayar1, N.Mekky2 , A. Atwan3- "Efficient Proposed Framework for Semantic Search Engine using New Semantic Ranking Algorithm"- (IJACSA)- Vol. 6, No. 8, 2015.
[3] M. P. Selvan, C. A. Sekar and P. A. Dharshini, ―Survey on Web Page Ranking Algorithms‖, International Journal of Computer Applications, vol. 41, no.19, Published by Foundation of Computer Science, March 2012.
[4] T. Berners-Lee, ―Weaving the Web‖, pp. 2-5. The Original Design and Ultimate Destiny of the World Wide Web by its Inventor. Harper: San Francisco, 1999.
[5] Dr Brian Matthews-" Semantic Web Technologies"-jisc- January 2005.
[6] Prof. Latifur Khan-" PAPERS ON SEMANTIC WEB RESEARCH"- 24 August 2009.
[7] Aidan Hogan and Andreas Harth and Jürgen Umrich and Sheila Kinsella and Axel Polleres and Stefan Decker: "Searching and Browsing Linked Data with SWSE: the Semantic Web Search Engine." In JWS 9(4), 2012.
[8] Syed Nisar Bukhari, Javid Ahmad Mir, Ummer Ahmad-" Study and Review of Recent Trends in Semantic Web"- ISSN: 2277-128X (Volume-7, Issue-6)-june 2017
[9] O. Harting and F. Huber, F., ―A main memory index structure to query linked data‖. Proc. 4th Linked Data On the Web (LDOW11), March 2011.
[10] V. Richard Benjamins, Jesús Contreras, Oscar Corcho and Asunción Gómez-Pérez- "Intelligent Software Components "-KRR2002WS_BenjaminsEtAl , 2002.



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