Technoarete Transactions on Advances in Data Science and Analytics
Vol-1, Issue-1, February 2022
e-ISSN: 2583-2956

Scientific Web Services for Communication between Two Electronic Devices over a Network: A Study

S. Swetha

Assistant Professor, EEE Department, Vel Tech Multi Tech Dr.Rangarajan Dr.Sakunthala Engineering College, Avadi, Tamil nadu, India..
Corresponding Author Email: swethasrinivasan4@gmail.com

Abstract

The study is focused on the concept of web services used for communication between two specific electronic devices. It is identified that there are different web services such as IP, HTTP, XML, HTML, Java and others. Furthermore, web services are the specific applications that support the communication between electronic devices by using the internet. The researcher has adopted a specific method and found a journal based on the research topic and that helped the researcher to analyze the importance of web services more effectively. Apart from that, system theory has been used by the researcher to understand the concept of web services and its usage appropriately. The usage of web services requires effective and efficient technological knowledge which creates a limitation of the process.

Keywords

Communication, electronic devices, interaction, internet, network, Web services.

INTRODUCTION

Web services are the XML-based information or data exchange processes that require the internet and refer to the application to application interaction. Communication is an important part of the life of humans and there are different systems to communicate with others such as email, massaging, video conference and others. All these processes require some specific devices for completing which are computer, mobile, laptop and others. Thus, the usage of the communication processes through electronic devices by using the internet is called the communication between two electronic devices. The purpose of the research article is to describe the importance of web services for developing the communication between two specific electronic devices.

Rationale

The number of internet users is increasing day by day in India and along with that some issues are also increasing. During the pandemic situation, the number of internet and web services users has increased and it is identified that ***nearly 50%*** people in India used the internet in 2020 whereas it was ***48.48%*** in 2019 ([12], 2021). The overuse of the internet and electronic devices impacts the ***health of people negatively*** and ***mostly eyes of people*** impacted by the usage of electronic devices. The usage of web services is effective to gain knowledge about anything but impacts the health of people negatively.

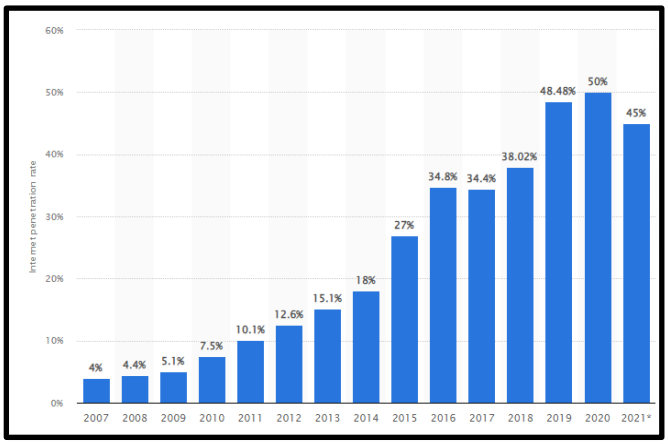

Figure 1: Increment of number of web services users in India (Source: [12], 2021)

Aims and Objectives

The aim of the research article is to describe the importance of scientific web services for communication between electronic devices.

Objectives

- To understand the importance of web services for communication between electronic devices
- To investigate the advantages and disadvantages of using web services
- To analyze the impacts of web services in the communication between two specific electronic devices

Research questions

Research questions of the article that helped the researcher to get the basic idea about web services and its usage are,

e-ISSN: 2583-2956

- What are web services and how is it used in different sectors?
- What are the advantages and limitations of web services?
- How web services impact the communication between two electronic devices?

LITERATURE REVIEW

Concept of web services

Web services are the services that allow the connection between electronic devices over the network. The components of web services are "***Simple Object Access Protocol''*** (SOAP), ***"Universal Description, Discovery and Integration"*** (UDDI) and ***"Web Services Description Language"*** (WSDL) ([5], 2020). Furthermore, the web services are mainly based on XML and the web services have the ability to be Asynchronous which makes the web services more efficient. It requires an effective internet connection and network to use web services and communication between devices. The usage of the system theory helped the researcher to understand the three phases of the web service process such as data provided by the client then using the internet and servers that are hosting the web services.

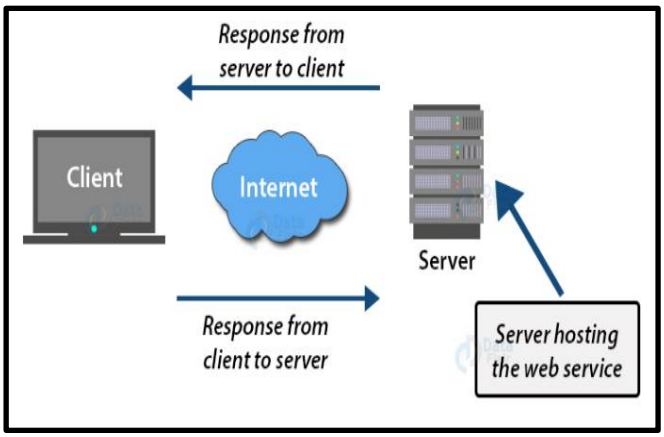

Figure 2: Concept of web services
(Source: [5], 2020)

Advantages and limitations of web services

There are some beneficial sites of web services as well as there are some limitations of using web services. Firstly, ***Interoperability*** is one of the biggest advantages of web services which enable the web services to provide a non-proprietary route to the users. Apart from that, ***Reusability and Deployability*** are the other advantages of web services ([3]. 2017). In addition to that, the web services can be reused which is another biggest beneficial site of using web services. Thereafter, web services ***affect the communication*** process largely as the communication between two devices is based on the web services and an effective internet connection ([4], 2018). On the other hand, fewer skills of technology and computers enhance limitations as the usage of web services ***requires effective technology knowledge and computer skills***.

Figure 3: Advantages and disadvantages of web services
(Source: Self-made)

Concept of communication between two electronic devices

The web services are deployed based on effective internet connection which enables the deployment of the web services over the fire wall. Two electronic devices require a strong internet connection for communication as well as it requires the allowance of web services ([7]. 2017). Furthermore, connecting two specific devices such as mobile and laptop is called the communication between two devices.

Theoretical framework

The usage of a theory in research studies is important for understanding the concept of research topics accurately and the researcher has used the ***system theory*** in this study. The theory refers to three specific processes such as inputs, processes and outputs. Thereafter, the web services are the inputs and the connection between devices is the process and the successful communication between the devices is the output or outcome ([10]. 2020). The connection between the theory and the research topic can be identified. The usage of the theory helped the researcher to understand and analyze the concept of web server and communication between devices properly.

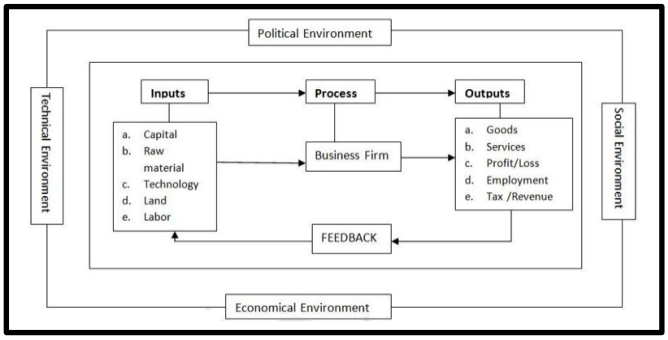

Figure 5: System theory
(Source: [10]. 2020)

Literature gap

The researcher reviewed different writings of different authors to gain more and more knowledge about web services. Although the concept of web services and its usage

e-ISSN: 2583-2956

is discussed in the literature review part, the usage of web services for the communication of devices is not clear in this part which indicates the literature gap.

METHODOLOGY

In this study, addressing the research objectives the researcher has conducted methodology by introducing a section of Systematic Literature Review. The section of literature review has defined the concept of web services, the advantages and limitations of web services, and the concept of communication that helped the process of the study is reliable and justified. As proposed by [6]. (2021), following and analysing the previous existing studies can help the researcher to identify the valid information. The researcher has forced on the relationship between two electrical devices to identify the effectiveness of web service applications. Using Google Scholar the researcher has found the articles that contain the heading of "web services", or "electrical devices", or "communication". It has been noticed that all the collected data should be extracted from recent years from 2017 to 2021 in order to make the study unpreserved.

Due to developing SLR, the researcher has contributed effort to make sense of the basic ideas. In the words of [2]. (2018), among the broadband resources found out the relevant article is a highly significant tool to make a research topic valid and sustainable for a long term issue. In order to find dynamic information regarding the communication process between two electric devices, the relationship of web services with various networks remains one of the serious concerns for the researcher. Among the mixed data the valid and recent data have been selected to modify the content with proper research. The search terms were used properly due to finding in the websites to identify the issues and limitations to provide exact data to make the study authentic and informative.

RESULT AND DISCUSSION

Theme 1: Impact of Scientific Web Services to Communicate Two Electronic Devices

Web services indicate a series of technologies that are capable of standing as an effective medium of communication in order to connect systems. It includes several types of software such as ***SUN, Microsoft, Oracle, IBM,*** and ***SAP*** and is capable of manufacturing new products or tools. As opposed by [11] (2021), web services have the facility that contains cost, time, and space for conducting e-business transactions. Managing business processes by connecting different kinds of electronic devices this service helps in maintaining the communication process. The adoption of web services has proved as capable of serving promising results by making faster integration and development productivity. Research opportunities in the area of web services have been identified as fruitful for both practitioners as well as academics. It is a common fact that communication technology requires proper knowledge in order to maintain, upgrade, and operate the process.

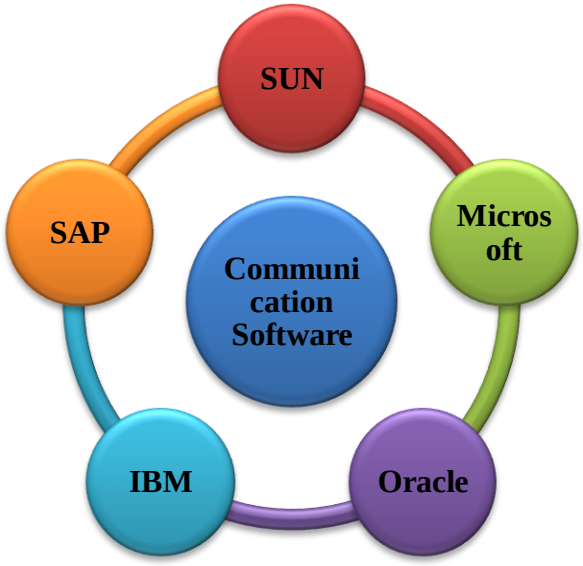

Figure 4.1.1: Communication Software in Web Services (Source: Influenced by [11], 2021)

Accompanied with web services this communication technology can easily connect two electronic devices to make a flexible connection. Electronic devices to build communication include ***computers, tablets, laptops, cell phones, personal digital assistants***, and other devices. As opined by [13]. (2019), both hardware and software systems of web services need to be continued development to keep pace with the modern technology system. Increasing both hardware and software systems by improving awareness and discussion regarding important applications and issues of web services is essential. As web services are software system, it is able to connect electrical devices in a flexible way and make the communication process in a dynamic way.

Theme 2: Usage, Security, Availability, and Accessibility of Scientific Web Services over a Network

After observing several things it has been found that data from a single sensor is not helpful in monitoring large areas or connecting two distant devices. In this regard, web services are identified as one of the most effective technologies that are associated with more than one signal. As per the view of [9]. (2019), being working by wireless sensor networks, web services are able to connect with different sensors. It is able to collect data related to the current environment and communicate it to other devices that transfer the valuable information to the cloud over a particular network. Due to exchanging data, there is a major issue in controlling and executing security in web services. It includes ***Authentication, Confidentiality,*** and ***Network Security*** that constantly raises cyber criminals and threats and makes challenges for its survival.

e-ISSN: 2583-2956

Figure 4.1.2: Security Issues in Web Services
(Source: Self-developed)

The availability of web services also remains strong and it is available in almost every area that making it more flexible with the competitors. According to [8]. (2018), web service technology does not take more than one month to roll out 100 PCs in an individual trust. Depending on any kind of network system, web services are capable of providing its communication service. In addition, it is able to provide accessibility of immediate reply based on the request information. For its advantages, the majority of the industries have adopted web services in their workforce to operate big data transfer systems as well as communication processes with a better approach.

RECOMMENDATIONS AND CONCLUSION

Depending on the entire analysis of this study it can be stated that adopting several effective strategies can make the ability to secure web services. By ***validating all messages, securing the transport layer, masking internal resources,*** and ***protecting against XML denial-of-service attacks*** the issues can be mitigated. In the words of [1] (2018), development of new machine learning models the service of communication method can be improved and provide an experience of problem free connection. Most of the web service network systems only focus on interoperability rather than a specific perspective that causes restrictions to use it. In this regard developing the focusing power, the problem can be reduced and an ideal platform of web services can be generated. The constant developing demand for web services has the possibility to continue future research directions.

Accompanied with real-time data and quick transfer accessibility, web service has gained popularity in the competitive business market. Depending on integration methods the researcher has made the study accurate to present the effectiveness of web services to connect two electrical devices to build a powerful communication service. Moreover, this study will help the readers understand both the advantages along with disadvantages of scientific web services to recognize the real power and impact.

REFERENCE

[1] Čolaković, A. and Hadžialić, M., 2018. Internet of Things (IoT): A review of enabling technologies, challenges, and open research issues. *Computer Networks*, 144, pp.17-39.

[2] Firouzi, F., Rahmani, A.M., Mankodiya, K., Badaroglu, M., Merrett, G.V., Wong, P. and Farahani, B., 2018. Internet-of-Things and big data for smarter healthcare: From device to architecture, applications and analytics. *Future Generation Computer Systems*, 78, pp.583-586.

[3] Gasparyan, A.Y., Nurmashev, B., Yessirkepov, M., Endovitskiy, D.A., Voronov, A.A. and Kitas, G.D., 2017. Researcher and author profiles: opportunities, advantages, and limitations. *Journal of Korean medical science*, *32*(11), pp.1749-1756.

[4] Halili, F. and Ramadani, E., 2018. Web services: a comparison of soap and rest services. *Modern Applied Science*, *12*(3), p.175.

[5] Kern, F., Fehlmann, T. and Keller, A., 2020. On the lifetime of bioinformatics web services. *Nucleic acids research*, *48*(22), pp.12523-12533.

[6] Liu, M., Fang, S., Dong, H. and Xu, C., 2021. Review of digital twin about concepts, technologies, and industrial applications. *Journal of Manufacturing Systems*, 58, pp.346-361.

[7] Liu, Y., He, K., Chen, G., Leow, W.R. and Chen, X., 2017. Nature-inspired structural materials for flexible electronic devices. *Chemical reviews*, *117*(20), pp.12893-12941.

[8] Navío-Marco, J., Ruiz-Gómez, L.M. and Sevilla-Sevilla, C., 2018. Progress in information technology and tourism management: 30 years on and 20 years after the internet-Revisiting Buhalis & Law's landmark study about eTourism. *Tourism management*, 69, pp.460-470.

[9] Noura, M., Atiquzzaman, M. and Gaedke, M., 2019. Interoperability in internet of things: Taxonomies and open challenges. *Mobile Networks and Applications*, 24(3), pp.796-809.

[10] Rakhmonov, I.U., Nematov, L.A., Niyozov, N.N., Reymov, K.M. and Yuldoshev, T.M., 2020, April. Power consumption management from the positions of the general system theory. In *Journal of Physics: Conference Series* (Vol. 1515, No. 2, p. 022054). IOP Publishing.

[11] Saura, J.R., 2021. Using data sciences in digital marketing: Framework, methods, and performance metrics. *Journal of Innovation & Knowledge*, 6(2), pp.92-102.

[12] Statista, 2021. Internet penetration rate in India from 2007 to 2021. Available at: www.statista.com/statistics/792074/india-internet-penetration-rate/ [Accessed on: 28th December, 2021]

[13] Tang, S., Shelden, D.R., Eastman, C.M., Pishdad-Bozorgi, P. and Gao, X., 2019. A review of building information modeling (BIM) and the internet of things (IoT) devices integration: Present status and future trends. *Automation in Construction*, 101, pp.127-139.