THE ROLE OF WEB SERVICE IN INFORMATION SHARING AND INTEGRATION OF EDUCATIONAL SERVICES

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ABSTRACT

This paper seeks to explore the utility and vitality of the web services in the educational domain. It will also illustrate various scenarios where web services could be a probable solution to a problem faced in the education sector. Although many web-based educational systems exist presently only a few of them are capable of sharing their components with others, hence a web service could be used to provide interoperability and reusability of various educational components.
The advent of web services can give a new dimension to the current education system altogether and this paper is all about proposing the ways and means to go about achieving the same.

Index Terms: About Four Key Words or Phrases in Alphabetical Order, Separated By Commas.

I. INTRODUCTION

Web Service is nothing but a method that facilitates machine to machine interaction over a network. It uses a standard XML messaging system and is not tied to any operating system or programming language. A Web Service is self-describing and easily discoverable via simple find mechanism. It is made up of mainly three components: SOAP, UDDI, and WSDL; A Web Service can be built on Solaris which can be accessed from your VB programs that runs on Windows.

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Now the significance or the purpose of web services comes in the picture. Here are certain points that illustrate the said significance:

- Web Services helps in exposing the existing function on to network
- Provides a way of connecting different applications through its interoperability
- Implements standardized protocol
- A very low cost of communication is incurred

With the aid of web services the education can be a lot cheaper, more resourceful, updated and dynamic. Web Services are tools that will make the process of education, in a developing economy like ours, transcend all the barriers ranging from cost to infrastructure to methodology with utmost ease.

II. ADVENT OF WEB SERVICES IN EDUCATION SECTOR

A lot has been already discussed regarding web services, still many a times it is often confused with web applications which is not very different from a web service, but there are two things that make a web service distinguishable from a web application they are firstly web-services are a very large scale implementation of web services and secondly they are exclusively meant for application to application (or device to device) interaction whereas a web application is meant for user to application interaction.

Here is an example that will clearly illustrate what a web service actually is: suppose without being logged into your account you type "pizza" in Google. You then are displayed a number of pizza joints near where you live. Now how did Google figure out your location? This is where a web service comes into picture; a web service has a list of IP addresses mapped with their respective locations. Google has your IP address all it has to do is use the GeoIP address to translate the IP address into the corresponding locations.

Since the concept is clear now, we must discuss the advent of web services in the field of education. The root cause of resorting to web services is that the conventional method of imparting education is becoming very expensive and also the traditional means is not scalable that is it is not adequate enough to adjust to the rapidly increasing student population, courses, technologies, etc. Hence the course of imparting education has adopted the route of E-Learning. It has already gained popularity as it is scalable and efficient.

Now there are two phases of E-Learning: first one is before the web-services came into picture and the second one is after the advent of web services. E-Learning before the web services was characterized by the following points:

- E-Learning was mostly done through web applications
- Applications were in the form of bundled suites.
- Bundled suites refer to the compilation of variety of features and functions'
- These applications were not exactly a jack of all trades
- Another major letdown of these suites were that they are heavy and bulky
- This bulk is useless because not everything is wholly utilized by clients.

With that the application phase ended and web services emerged. Web services have the ability to build finely grained components that can be reused if a need of similar nature arises in the future. Switching to web services induces a win-win situation because it is beneficial to both client and the vendors, for clients there is a greater choice as well as customization options. And the vendors can be benefitted by the unbundling of the applications since now they can sell it at the same price but the number of applications sold would be more because of the unbundling hence the profit would increase in geometric progression.

III. ACHIEVING INTEROPERABILITY WITH THE WEB SERVICES

The Web Services facilitate interoperability between two different applications or machine by implementing the following **Data Exchange Architecture.**

In a typical Web services architecture, a service provider has a service that is made available to other systems to use. The provider creates a WSDL service description that defines the service interface, that is, the operations of the service and the input and output messages for each operation. The provider publishes its WSDL service description to a discovery agency. Service requesters find services via discovery agencies and use the WSDL description to interact with the corresponding service provider. A typical exchange scenario that results from a Web service call induces the following steps: (i) execute the service at the provider and produce relevant XML documents from source data and, (ii) ship the produced documents to the requester that consumes them. We use this architecture as the basis for exchanging large data volumes and extend it with the ability to register fragmentations and with optimization capabilities.

First, the source and target systems independently specify their respective fragmentations using an extension to WSDL and register it at a discovery agency (Step **(1)**). Discovery agencies are repositories of WSDL specifications which may be mapped to Universal Description Discovery and Integration (UDDI) for publishing and discovery of existing services. The discovery agency generates a mapping between the two fragmentations and a data transfer program that combines and splits source fragments to generate target ones (Step **(2)**). The decision of where to perform an operation depends on how much it costs at each system. As in publish & map, we expect the service endpoints to be able to split fragments in order to store them. They may not however have the ability, or the intention, to combine fragments. This is captured in our cost model. Distributed processing is achieved by probing the source and target systems, which implement an interface to provide the cost of each primitive operation (Step **(3)**). In step **(4)**, the discovery agency assigns operations to the source and the target, which generates and executes code on their internal data structures. The discovery agency acts as a middle-ware that does not know about the internal data structures used by the source and target systems. All it sees is the fragmentations defined by each system and a cost interface. The way each fragment is actually produced or consumed by a system is hidden by the WSDL interface. Therefore, the discovery agency needs only high level operations to transform fragments.

IV. PROPOSED SCENARIOS OF WEB SERVICES IMPLEMENTATION

Document-sharing: A web service could be designed that could facilitate exchange of notes among students or between a student and an instructor. This web service would provide secure access to documents irrespective of location or device. And as the author of the documents one can selectively share documents, with centralized user management and tight control over sharing. If the author wants he can also restrict download. Also this web service would provide a space where users could give their feedback.

Attendance Tracking System: This web service if implemented could be beneficial for the students who study in institutions where there is a requirement of a certain percentage of attendance for each course in order to be able to successfully complete the course. The web service needs to be designed in a way that it keeps a daily track of the bunks in every course and prompts the student by sending a warning message to his cell phone that his attendance is falling below the required standards. In this way a student could be pre-alert about his attendance.

Keeping people connected: A web service that could keep people connected through a unified contact. There are many Social Networking Sites that could facilitate the same so what would be so special about this web service. This web service would integrate all the social/professional networking sites which implies that regardless of your account on any of the above mentioned sites, you need not create a separate account to be able to stay connected. With this web service each user could use his/her own personal account, this web service acting as the middle ware, could help connect to the user who has logged in using his personal account.

Online document storage: This web service is, in part, of similar nature to the previously mentioned web service pertaining to document sharing. But this web service would not facilitate document sharing, it would be exclusively meant for secure online document storage. Now the significance of this web service lies in the fact that there is a higher probability of risk of data loss if any physical medium for storage is used, hence this web service would act as a safe for the important and confidential data.

Holding multi-party meetings: A web service could be implemented that could host real-time meetings for students as well as instructors online. This would facilitate the instructors and students to interact face to face without the imposition of being in the same vicinity.

Creation of web-survey tool: Creating a web service that would conduct surveys based on a particular topic and record responses. Based on the responses it would generate the required data in the statistical format which can prove to be useful for the purpose of research and administration.

Hand-in folder for instructor: This again could be an implementation of web service which could be of utmost necessity for not only the students but the teachers as well. This web service would manage handing in course assignments online. All the instructor is required to do is to create a hand-in folder for each course with a list of assignments. Set a start and end date of submission. The web service will automatically prompt the student regarding his due submissions and also send a reminder one day before the deadline. This web service would relive the instructor of handing the assignments to the students every time or remind them constantly of their deadlines. The student would become more responsible as there will remain no room for negotiations once the deadline is past as the folder would no longer accept any more submissions.

Web-service enabled content repositories: This web service as the name suggests would act as a content repository. It would go out and discover new learning resources available on a daily basis, find them, retrieve them and integrate them into a course.

V. CONCLUSION

Web services are the next best alternative that will lead to the advancement of not only the education sector but economy as a whole. Thus we need to spread awareness regarding this concept, so that we can bring about a change that will benefit us in the present era.

This decade has witnessed a lot of technical advancements and there are many more to come but web services in the educational field is going to be one of the biggest breakthroughs that have come forth in the recent times.

The use of web services in the education are going to increase tremendously from a limited few to infinite, so all we need to do is be prepared to witness the dynamic age of education which will cater to the needs of anyone and everyone who wishes to gain knowledge and education.

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