Web Databases Using Pull or Push Technology–A Review

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Abstract—*A Databases system is basically a computer based record keeping system. The collection of related data is usually referred to as the database that contains information about one particular enterprise. In today's time each and everything can be performed on the internet, but the question arises HOW to store data? The frequent usage of an application to store data increases the requirements for the web database in digital sector. The future is in web database, which would transform the real world records of our computing machine into virtual web database. Our application or method provides facility to store the data or file in XML format within the device memory in case internet is not available. When connectivity regains then the application inform the server and the XML file or data is stored in the web database of the server.*

1. INTRODUCTION

"While making a hotel or airline reservation or while depositing or withdrawing funds from a bank, or if we purchase something online such as a book, toy, or computer" —chances are that our activities will involve someone or some computer program. These interactions are examples of what we may call as Database System.

A Databases system is basically a computer based record keeping system. The collection of related data is usually referred to as the database that contains information about one particular enterprise. Technologies based on database have a major impact on the growing world of electronic brains and also it is courteous to say that databases plays a crucial role in the flourishment of digital world. "A database represents some aspect of the real world, sometimes called the mini-world or the universe of discourse (UoD)."[1].The most fundamental feature of database technology is that it provides native representation of the external world of interest.

1.1 What's the use of Database?

"We think that database are just used for storing large records – IT's NOT"

a. Database systems reduces data redundancy to a large extent – For eg : Imagine if there is a data duplication in a bank , then there is a chance of having a same bank account number of more than one applicant which would be a great blunder. To avoid such case, database provides a centralised control of generating a unique ID for each record which helps to evade data redundancy.

b. Database facilitates sharing of data – For example: In Amazon books store, record of each book is stored within the database which is been publicly accessible or shared with different users.

c. Database enforce standards – for eg: In any database each record is been specified with a data-type as per the usage of the required entry of the record.

d. Database provides with data security – for example: In field of social media, all of ours private credentials and information is been stored within their database and is not shared on public platform which provides the user with its data assurity.

2. WEB DATABASES AND FILTERING - INTRODUCTION

In today's time each and everything can be performed on internet, but the question arises HOW? Most of the services or each of the services which we enjoy on the internet is somehow associated with the Web Database. World with full of digitalisation we cannot imagine an online service without database. For example– Many e-commerce companies and digital libraries uses huge databases to store their end users information which can only be retrieved by using queries to the back-end databases. In current scenario, many web sites have their own database driven interface and access to forms that creates HTML pages on the fly.

2.1 Definition

A web database is an application which is designed to be accessed through the internet or that application which can be queried or updated through the World Wide Web (WWW). In a web database the information or the record is stored on the web server instead of our own computer. A web database has a bi-directional flow of data that is one of the user or applicant enters the data or the record from one side in the web database

and other user could see or analyse all the records of that database through a specific web page.

What if we don't have any knowledge regarding the same??

Web database still provides you the facility (in the form of Google drive or cloud) to store the data without any prior knowledge of database.

2.2 Why database on web?

The basic question which arises is that why we need a web databases like dropbox if we can just increase the size of the hard-disk of our personal computer when we want. But what if we want to add 20gigs of space in our computer?

The answer of these questions are that in our home pc we need only 2gigs of space or so, we won't get any special hard-disk for that but in web databases one has to pay for what one need. If the need is of 2 gigs of space then pay for only 2 gigs and not more than that or not for whole 1TB hard-disk.

For example of Dropbox, 1tb of hard-disk would cost much less than the 1 year of sponsorship of Dropbox then why to purchase 1 year sponsorship if we could have 1 tb of hard-disk? Let's imagine that one has stored all records or information in a hard-disk, but what if there is a meteor falling down at your place or what if the hard-disk fails at some point or any instance that would lead to your data loss, to prevent those circumstances you could keep your records or information in web database so that the data is secured in different parts of the world so that even if there occurs a problem or failure in any one part of the world then your data is still safe in some other part of the world.

Also if there is need to backup mobile data such as photos, videos etc we need not to carry the hard-disk with us, we just need to switch on our internet and just take the backup on web database and also we could restore our information from the web database any where we want and on any platform(Android, IoS, Windows, etc). That is why web database are important.

2.3 Pro's and Con's

Within the last decade, the rapid evolution of the internet has opened the door for organisations to take the benefits as a means to improve their operating efficiency, lower cost and ultimately give themselves a competitive advantage over their competitors. Web based applications are increasingly being used to handle tasks done by traditional applications such as data storage and transaction applications. Being web-based, web applications have significant benefits over their traditional counterparts but with being web based also come many challenges for developers due mainly to their dynamic nature [2]. So some of them are as follows:-

They are easy to develop as they are based on Hyper Text Markup Language which is easy to learn and code. As the name suggest, it is totally independent of the operating system

and are accessible via web browsers. Most of the web browsers are working on higher technologies but they have HTML being standard in all their versions which makes it more flexible for any computing machine. But what about if one don't have an internet connection? Or if the internet connection is slow down? This causes the reliability factor to come in existence. In some remote areas the internet is currently unreliable and slow communication medium. At times servers can be down and a message may be delayed to be sent. Also at peak time when it is significantly slow. Also some highly interactive database applications may not be converted easily to web based applications, while still providing the same user friendliness.

3. ARCHITECTURE

The web and the databases are been bought together through three-tier or three logical application layers. When any database is available directly to any user such as programmers or any local applicant of small organisation for quick access of the data then that kind of architecture is known as one-tier architecture.

3.1 When database is connected to web

Several technologies have been set up to connect databases to web, which mainly differs in the format of who send queries to the database. The main layers or levels of web database environment are web browser(acts as a client), web server(mainly HTTP) and the database(mainly SQL). In a Web Database the user is required to pull the information from the database server and the server then Push the data or the information from and send it to the user. That's how the Pull and Push works in case of Web Databases. Web database connectivity is basically of two type two-tier technology or three-tier technology.
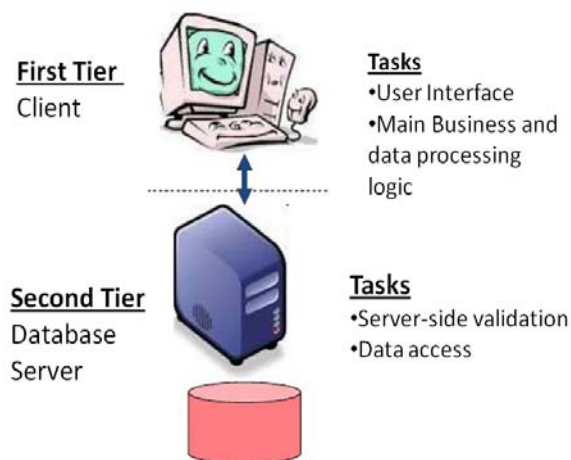
3.1.1 Two-Tier Technology

Fig. 1: Two-Tier Application

In two-tier architecture only two application layers are involved, that is client tier(web browser) and the other tier is the database tier(database server). Most of the organization uses two-tier web services only, where the application runs within the web server. There is no permanent connection between the browser or the server. Instead when a request or response id sent to the server it temporarily creates the communication for sending and receiving the request from the browser.
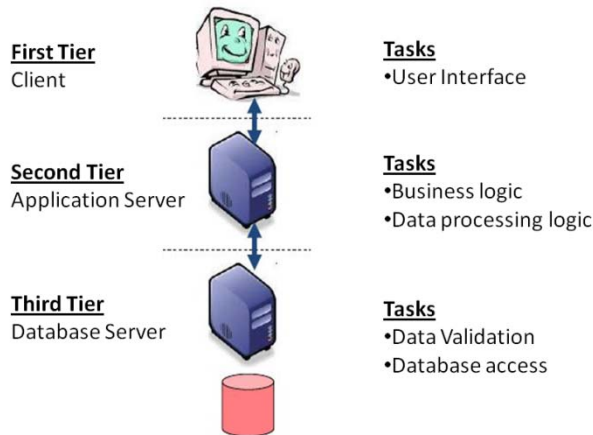
3.1.2 Three-tier Architecture

Fig. 2 Three-tier Application

In three-tier architecture a new tier or application layer is added between the client and server that is application server. This application layer is used to handle all the procedure or progression for the client. This layer is also responsible for transferring data or records between the client and the server. But the problem arises with three-tier architecture is that it possibly causes memory problems, as it starts copying the services of a program which was submitted to the web browser or client.

3.2 Behind the Scenes

All of us must we wondering that if we would store our data on the web then where would it go? We all have understood the concept of web database and how does it works. A web database is nothing but a collaboration of different server or even hard-disks or SAN/NAS that are present at difference part of the worlds. Many organization has developed a web server for this task, in background they just give there hard-disk or any network storage device that we can use for storing our data in it. They have connected there storage devices to the web browser that is to the client through any server like Apache Tomcat etc and are providing there storage space to store data. The hard-disk of the organization is first created on RAID 1 through which they store and maintain a duplicate data of the client, so that if there is any chance of failure in the

hard-disk or the storage device then there would still be a backup of all of the client's data.

So by using web browser there is no case of failure or chance for data loss. So this means that the work done behind the web databases is just about sharing of ones storage space for the use of another user around the world.

4. WEB DATABASE METHODOLOGY

For sending any data to a web database we first need to select the file (that we want to send) from our own digital device like smart phones, personal computers etc and then we could send the file/information to database, but for all this procedure an internet connection is required. What if there is no internet connectivity (for example while travelling) and still there is need to send the data or the information to the web database?
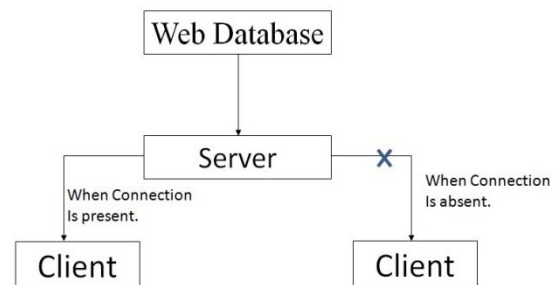

Fig. 3: Layout depicting the issue.

To solve this issue we have come up with a solution. In case a user wants to send or store the data in web database, we could create a log XML file in the user's own device so that when user wants to send some data, he could just select the file and then select the web database on his device only like any smart phone. For example if a user want to send an image or any document file from his smartphone to the web database, he just need to select the file and the web database like Dropbox etc and click on send button.
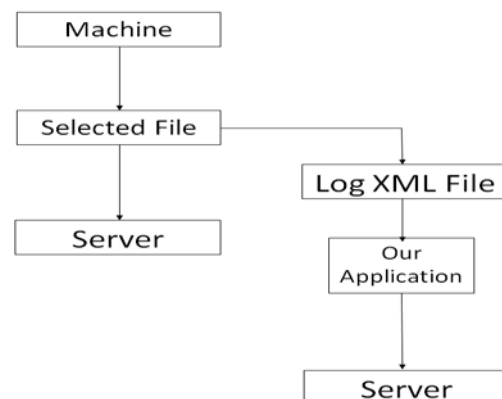

Fig. 4- Layout depicting the working of our application

When there won't be any internet connectivity, then the selected file's path or data would be stored inside a log XML file. When the internet reconnects then through our third party application a request would be sent to the server to read the log XML file. After this the server would automatically read the log xml file (the path of xml file would be given in advance to the server) and then read the path or data that is stored or written inside that file (in xml format). The server would then read the given path one by one and would select all the files whose path is given and hence it would store the file/data in the web database.

Also after reading all the path and sending all the files related to that path, the server would delete all the content of that log xml file, so that the memory of the device won't decrease and hence the performance will not be effected anyhow.

5. ACKNOWLEDGEMENT

This paper is based on research conducted on the "Web Database & Filtering". It was a great opportunity for us to write about the subject like this. At the time of preparing this paper we have gone through different books and websites which have helped us to get acquainted with new topics. We have shrinked our focus more towards defining new ideas in the digital world and still working towards its implementation.

Apart from us, this paper will certainly be immense importance for those who are interested and seeking in depth towards this subject. We hope they find it comprehensible.

We are grateful to dozen of friends and colleagues in encouraging us to start our project, persevere with it and finally to publish it. We have tried hard and soul to gather all relevant documents regarding this subject. We don't know how far we are able to do so. Furthermore we don't claim all the information in this paper is included perfectly. There may be shortcoming, factual error, mistaken opinion which all are ours and we take full responsibility for the same. Moreover we will try to give better volume in future.

REFERENCE

[1] Fundamentals of database system(Sixth edition) – Elmasri and Navathe (book)

[2] https://www.ukessays.com/essays/information-technology/advantages-and-disadvantages-of-web-databases-information-technology-essay.php.

[3] Fig. 1 Two-Tier Application – https://www.slideshare.net/idroos7/web-database-60317328, slide 45.

[4] Fig. 2 Three-tier Application - https://www.slideshare.net/idroos7/web-database-60317328, slide 44.