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webOsys: Web Browser towards an application platform

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Abstract— In today's era of computing, web browser has become the target platform for various applications such as spreadsheets, calendars, games, media player and IDE for various programming languages. These were initially written for the operating system of conventional desktop. A paradigm shift has been taking place, users have no longer been using the personal computer for the services that has already been made available on a single window i.e. web browser. In this paper, we summarize our system webOsys, which is web-based information desktop where users can manage and store their resources such as documents, web sources and services. Based on our work with this system, we have analyzed and tried to overcome the drawbacks of already existing systems. Also we have proposed, possible future enhancement to our system to make it better.

Index Terms— Self-supporting, Integrated Development Environment, light-weight, zero installation, SaaS, PaaS.

I. Introduction

At present web has become one of the most important components for software system applications. Most of the software applications now-a-days are written for web instead of conventional desktops. As significant amount of functionality has been created and shifted into the web, web browsers have become a dominant client application platform to satisfy all of their computing needs, from information search, shopping, banking, communication, office tasks & entertainment [1].

In web based software's, applications are used as services, furthermore they need no installations & manual upgrades and also support multiple users, to interact & share applications over the internet.

The systems like 'CloudMe', 'eyeOs' & 'G.ho.st' have already been developed. But according to us they have certain drawbacks as explained in the later sections of the paper we have tried to overcome them by this proposed model.

In this paper we have implemented applications which integrate with web browser for giving services of a conventional desktop and provide resource access, control and sharing of data which enhances the quality and functionality of web applications to be at par with the desktop applications. [3]

II. WebOsys Overview and Salient Features

It is a web application that is truly interactive with "zero installation". It has a rich user interface with direct manipulation capabilities. The deployment of this application onto the web browser requires no installation or manual upgrades. This system can also function as an integrated development environment (IDE), which allows user to compile and view their output in an in-built editor like HTML and C# editors which are integrated in our system.

Our whole system is a self-supporting. By self-supporting we mean that within our system it is possible to "Live Inside" the web browser and perform all necessary object creation and manipulation operations. This system does not require anything other than a web browser with Scalable Vector Graphics (SVG) support, such as Apple's Safari, Google's Chrome and Mozilla's Firefox. A screen snap shot of how our entire system will look like is as shown in fig 1 [1] and below that shows the architecture diagram of our system.

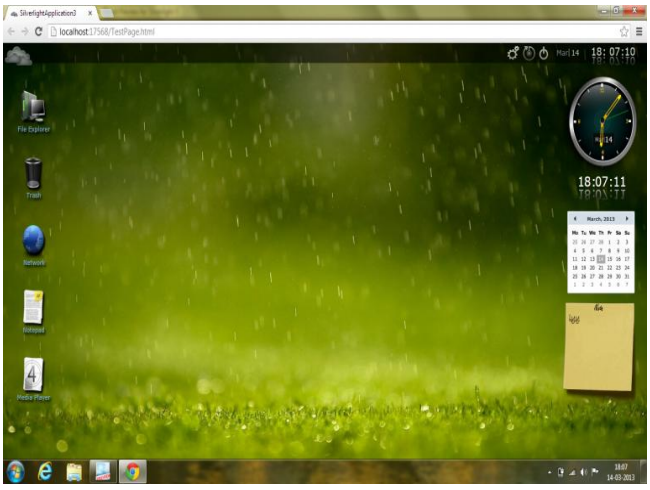

Fig. 1. webOsys running in Google Chrome Browser

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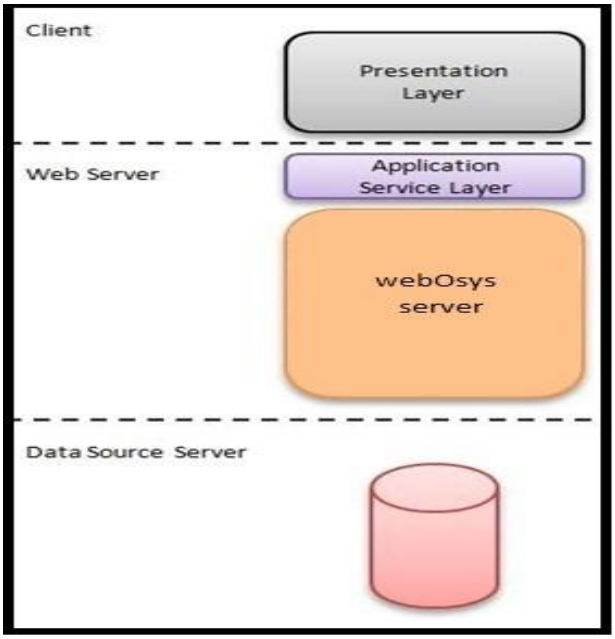

Fig. 2. Architecture of webOsys

In our System the purpose of Presentation Layer is to make sure users gets the best possible User Experience. It should not include too much business logic, instead it will communicate with a Web Server to perform business operations. This is done by accessing an Application Service Layer which in turn will communicate with the webOsys Server.

III. Characteristics

Some of the important characteristics of our system are as explained below:

- webOsys is different than other system as though it supports desktop-style applications but also it supports an IDE which makes the whole system self-supporting and able to improve and extends itself dynamically.
- **Ease of access:** The service will be available on the web via the browser, with fewer overheads like one time installation of small plugin.
- **Installation:** The system is designed with Microsoft Silverlight used to design Rich Internet Application. The webOsys will require only the Silverlight plugin to be installed on the system. The Silverlight plugin is small and easily available. Now a day's new systems incorporate Silverlight as a preloaded component.
- **Resource Retrieval:** The system adopts the web directory concept for navigation purpose. Users can retrieve information by navigating the directory structure, lookup the resource index or searching the resource contents.[4]
- **Sharing:** The system will allow users to share data with the other registered users.
- **Security:** When the users accessing system will change an OTA shall be sent to the users for authenticating the user.

IV. Design Principles

- Efficient utilization of resources and services through multi-user support from web i.e. webOsys.
- File structure is able to manage and index the files and data in structured order. Application is able to store data on the specific indexing and structured way.
- Logs will be maintained for fast searching and sorting of resources on the web.
- Notepad, calendar, sticky-notes, media player, HTML and C# editor are desktop-based applications which are integrated in the web browser as an initial step to start the development of the system with.
- It basically follows the cloud computing concept of software as services (SaaS) and platform as services (PaaS).

V. webOsys phase of Development

We have developed the application using Microsoft Expression Blend using the Silverlight framework. Microsoft Silverlight is an application framework for developing Rich Internet Applications. The run-time environment for Silverlight is available as a plug-in for web browsers running under Microsoft Windows and Mac OS X. We have created a canvas for the desktop & then placed the various widgets & shortcuts over it. Widgets like 'Analog Clock', 'Digital Clock', 'Sticky Note' & other general applications like 'My Computer', 'Recycle Bin', 'Media Player'. The Microsoft Expression Blend facilitates easy designing & development. Just by creating an object & setting its functionality at clicks. Microsoft Expression Blend connects internally with Microsoft Visual Studio, thereby allowing the user to write the code for functionality in C# or Visual Basic, without opening a new window, as it opens a child window of the respected C# or Visual Basic environment. The user should just enter the functionality to be performed, and the rest of the code is auto generated in it. The program can be executed or checked just at a click. Silverlight is a new cross-browser, cross-platform implementation of the .NET Framework for building and delivering the next generation of media experiences and Rich Interactive Applications (RIA) for the web. It runs in all popular browsers, including Microsoft Internet Explorer, Mozilla Firefox, Apple Safari and Opera. The plugin required to run Silverlight is very small in size hence gets installed very quickly.

We have used Microsoft SQL server 2005 for the back end. The MsSQL is used to store the details related to the registered users. The details of the users like, name, age, phone number etc. Along with the personal details other system related details like the access rights/ privileges to each of them. As the administrator will only be having access to all the fields whereas the other low level users will be having only certain rights like ‘only read’ or ‘read/write’ etc. The users before performing any action are checked for their rights, & according to the rights they are granted access to perform the operation they are desired too. Whenever a new user gets registered his/her name will get added into the MsSQL database. The administrator can anytime modify the rights of the users accordingly.

While deploying the system, the internet bandwidth and access delay must be in ideal state so as to avoid the problems

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during its execution inside the web browser. The implementation will take care of usability as well as networking and security issue that always come with web applications. Primarily authentication is provided to register and access services based on the privileges and perform different operations on them. The entire system developed is a light-weight application. User located anywhere can get access to use the services and its data on the go.

VI. Observation of Existing System against webOsys

Table. I. Comparison with already existing systems[7].

Systems	G.ho.st	eyeOS	desktopTwo	webOsys
Browser Support	Safari, Partial Chrome, Opera	Firefox 3, Safari, IE7	IE7	Chrome, IE7, Firefox
Third Party Applications	Yes	Yes	Yes	Yes
GUI	Windows like	Customizable	Mac + Windo-ws like	Widows like + Customiz-able
Downloadable to Web Server	No	Yes	No	Yes
Still Active	No	Yes	No	Yes
Free	No	No	Yes	Yes
Plug-ins	Yes	Yes	Yes	Only during Installati-on

VII. Future Recommendations

- Currently the system has been designed targeting small labs or college laboratories.
- In future, the system can be deployed over the cloud and thereby expand its scope and users.
- New applications can be designed and deployed over webOsys in order to provide more services to its users.

VIII. Conclusion

With webOsys, we observe as to how World Wide Web in near future will be a target platform on which applications would be developed and deployed to their users. Also we have demonstrated that, by designing webOsys we developed rich user interaction, advanced graphics, integrated development environment and online collaboration. Web-based applications require no installations or upgrades. They can be developed as a light-weight application that can be accessed from anywhere using any system such as a cell phone.

Since web browser can take over the roles of the conventional operating system, it will be the New Operating System to be used in the future wherein, software developers would develop, deploy and use software only for the web.

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