

# A Survey on Various Web Technologies

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**Abstract**— A web application is one that is invoked due to a web browser over internet. In just a decade, the web has grown from a repository of static web pages to a powerful platform of choice for developing dynamic applications using large number of web technologies and languages. This survey covers five web technologies from different phases of internet development showing their features for web development.

**Key words:** Rails, JSON, PhoneGap, Web 2.0, SEO, Website, Conventions

## I. INTRODUCTION

With the rapid development in internet, new web technologies are getting evolved continuously. The past ten years have seen a drastic change in the scenario of internet. The increasing demands, new challenges, and the complex solutions lead to the development of new technologies. New technologies make the work easier and facilitate the developers with new features. Here are some of the new web technologies covered below- Ruby on Rails, Web 2.0, JSON, PhoneGap and Search Engine Optimization (SEO).

### A. Ruby on Rails

Rails are an application-development framework based on Ruby language. Ruby is an object-oriented scripting language [1]. Ruby on Rails provides a great platform for creating web 2.0 based applications. The dynamic features of Ruby language helps in replacing large blocks of code with suitable commands through few lines of code. Ruby can be used for coding conventions and templates. Conventions are the integrated programming capsules that are designed for immediate use without any run-time configuration (an in Java) [1]. This in turn helps in development easier. Rails uses the same block of code for same purpose throughout and any changes to the code at one place is reflected in the other instances of same code.

Ruby on Rails platform can be used for easier and quick development of applications like:

- Web applications which uses relational database. The object-relational mapper of rails framework directly connects programming objects to the fields of database.
- Consumer web services.
- Creating and implementing APIs and web services.
- Mash up of existing web services and applications [2].

Rails can be used for easy deployment of web sites that extracts information from a database to a web application e.g. e-commerce, data retrieval and online communities. The implementation of Ruby with Rails serves as an important developer tool for any programmer.

### B. Web 2.0

Now with the development of network technology, the internet has entered web 2.0 from web 1.0[3]. In web 1.0, people used to go behind the information but in web 2.0 information comes to user. A Web 2.0 technology is used in

services which provide online information to people in their daily activities. Web 2.0 provides interaction services such as blogs, wikis, etc.

#### 1) Features of Web 2.0

Web 2.0 has seven features: Blog, Wiki, Instant Messaging (IM), RSS, Social Networking Sites (SNS), Podcast/Streaming Videos and audio content, Social Bookmarking/tagging.

Blog is a kind of informational site in which discussions take place. The discussions are displayed in reverse chronological order. Different blogs can be easily linked, providing user to travel along the interested direction.

Wiki is a website developed by a group. Everyone contributes in its development and can be edited by anyone. The various contributors can easily create pages and can link each other.

IM is a live communication channel where two people can interact with each other online. It is quicker and easier to communicate through IM than e-mails.

RSS uses a particular format to present frequently updated information like news headlines, etc. It is an XML file that informs user of updates.

SNS is a website where various users share their personal or professional details and interact with each other. Sites like Facebook, Myspace provide a great platform for multiple users to share their contents.

Social Bookmarking is a way where users save interesting web pages and share them as well.

Podcasts allow users to listen to audio files online without downloading them and without use of any software.

#### 2) Advantages

Advantages of web 2.0 over its predecessor web 1.0 are

- Flexible web design
- Reusability
- Updatable
- Responsive user interface
- Collaborative creation of websites
- Establishment of social networks [4].

### C. JSON

JSON or JavaScript Object Notation is a lightweight data exchange language. It is similar to XML in adopting complete text formats but relatively easier than XML for machines to parse at the client side and generate it at the server side. JSON is a serialization format rather than a logical data model. JSON includes features similar to C language which makes it good with readability and reduces redundancy.

JSON uses two data structures:

- An ordered list of name/value pairs (“name”: “value”). In different languages it appears as object, record, structure dictionary, keyed list or hash table.

- An ordered list of values ([object1, object2]). In other languages it appears as array, vector list or sequence [5].

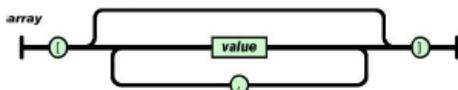


Fig. 1. Array in JSON

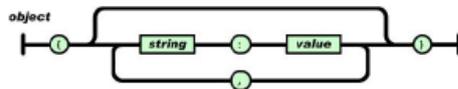


Fig. 2. Object in JSON

JSON was earlier used in JAVASCRIPT for data exchange but with its development it supports other data format for other languages also. JSON incorporates features like small space occupancy which makes it suitable for AJAX applications [6]. JSON data-exchange format can reduce the work of calculation resources of phone for light-weight applications, thereby reducing the network transmission time and quicken the network transmission speed. Thus, JSON is one of the most ideal data-exchange languages.

JSON still has some deficiencies pertaining to standardization, security and other aspects at present which are thought to gradually improve in future with the advent of web technologies.

#### D. PhoneGap

PhoneGap is a frame which is used for developing cross-platform mobile applications. It uses web technologies, namely HTML, CSS, and JAVASCRIPT, to create the applications which can be used in different mobile operating systems, instead of mobile-specific languages like objective-C [7]. It is an open source frame and it supports seven platforms, android, Symbian and IOS being some of them.

##### 1) PhoneGap architecture

The architecture of PhoneGap can be divided into 3 layers: Web Application, PhoneGap, and OS and native API's.

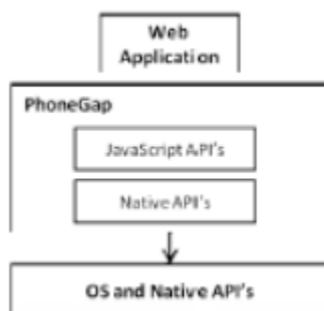


Fig. 3. PhoneGap Architecture

The top layer contains the source code of the application. The central layer contains two components - JavaScript and Native API's. This layer acts like an interface between the application layer and PhoneGap layer. This layer also takes account of the interfacing between the API's used by the application and the native API's used by the OS.

PhoneGap acts like a 'wrapper'. Developers enclose applications structured in known languages to native applications. PhoneGap applications are a mixture of web technologies and native API's. They are neither purely web-based nor completely native to OS. This is because layout rendering is done using web technologies and some features

that aren't supported by the web technologies are covered by the native API's.

##### 2) Advantages

Coding in standards like HTML, CSS and JAVASCRIPT is easier as compared to mobile specific language like Objective-C. This saves company's time and money which is to be invested on the developer to learn the device specific language [8].

The apps need to be developed just once and then it can be used at any platform, saving client's time and money. The interface of these apps is similar to the native one's, without the browser frame around. It supports seven platforms, BlackBerry, IOS, Android, Samsung Bada, Windows, Symbian, and Web-OS.

#### E. Search Engine Optimization (SEO)

In today's world, users just visit the first few pages on searching something in the search engine. The low ranked pages have very less probability of seeking attention. So, it's very important to increase the ranking of websites through search engine optimization.

Factors affecting search ranking are webpage correlation (degree of keyword matching, keyword density, keyword distribution, webpage tag labels), links weight (external and internal links), and time-based factors (webpage age, domain name registration, link age) [9].

##### 1) Methods of keyword optimization

###### a) Keyword optimization:

The search engine searches the webpage on the basis of keywords available in website. So it is very important to have keywords placed effectively.

- Keyword selection- Proper selection of keywords should be done the rank.

Following things must be taken care of while selecting the keyword

- Keywords must be related to the content of the website.
- The keywords should be the most frequently searched but less competitive.
- Keywords should clear and not be too broad [10].
- Keyword density- The keyword density means proportion of keywords present to the other text of the webpage. A range of 3%-8% is considered to be good. The higher the keyword density higher the rank will be. But at the same time keyword heap must be avoided.
- Keyword distribution- Proper distribution of keyword can also increase the rank of the website. Important places to place the keyword are title, Meta section, headers, Alt attribute of image, etc.

##### 2) Website Content Optimization

Website composed by copying web pages directly from other sites doesn't index your website. So the content must be unique and must be continually updated in order to increase the rank. The search algorithms of the search engines will visit such pages more frequently.

##### 3) Website Structure Optimization

Search engines don't understand advanced buttons and all. So the website should a simple website navigation system

written in HTML. Establishing a website map is a good practice.

## II. CONCLUSION

In this paper we have discussed, reviewed and analysed some of the latest web technologies that are getting more and more attention. The continuous needs and demands led to the development of the discussed technologies. These technologies are still developing and more and more features are being added to decrease the complexity and make the work easier.

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