

A REPORT
ON
RESUME MANAGEMENT SYSTEM (RMS)

BY
UTKARSH ASHOK PATHRABE -- 2012A7PS034P

AT
CMC LIMITED, MUMBAI
A PRACTICE SCHOOL-I STATION OF



BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI

(May-July 2014)

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UTKARSH ASHOK PATHRABE -- 2012A7PS034P

Prepared in partial fulfillment of the

Practice School-I

Course No.: BITS F221

AT

CMC Limited, Mumbai

A Practice School-I Station of



BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI

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**BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI
(RAJASTHAN)**

PRACTICE SCHOOL - I

Station: CMC Limited

Centre: Mumbai

Duration: From 23rd May 2014 to 17th July 2014

Date of Submission: 15th July 2014

Title of Project: RESUME MANAGEMENT SYSTEM (RMS)

Name of Experts: Ms. Swapna Tendolkar, Mr. Trushant Doke

Group: IIS

Name of PS-I Faculty: Prof. Bhibas Ranjan Sarkar

Project Area(s): Technical Database Documentation, Designing User Interface (Website Development), Software Unit Testing, Excel Spread Sheet and Word Document Parsing and Learning Server-Side Architecture of Web Applications.

Abstract: I have written the database documentation and have done unit testing for Resume Management System (RMS) software. RMS is a tool developed in CMC Limited, which aims to digitalize the manual recruitment process in CMC Limited. I have designed a user-interface for the RMS software using tools like XHTML, CSS, JavaScript, HTML5, Twitter Bootstrap etc. I have done Excel Sheet and Word Document Parsing in Java using Apache POI for the RMS software. I have also studied about how to do the Server-Side Architecture of Web Applications using Vaadin in Java on the 'Apache Tomcat' Server.

Signature of Student

Signature of PS-I Faculty

Date:

Date:

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INTRODUCTION

About CMC Limited

CMC Limited is a leading systems engineering and integration company in India, offering application design, development, testing services and asset-based solutions in niche segments through turnkey projects of national importance.

Since its inception on December 26, 1975, CMC has been a frontrunner in providing IT solutions and services. CMC was the first ever enterprise in India to set up a countrywide data network called INDONET - a computer network providing access to major cities in India, way back in 1985.

In October 2001, CMC was privatized by the government of India, in a sale to Tata Consultancy Services Limited (TCS Ltd). It is thus a part of the US \$ 100.09 billion Tata Group, India's best known business conglomerate.

Today it is an ISO 9001:2000, certified and CMMI Level V accredited organization, is positioned as a premier IT solutions provider in the fast growing and competitive IT market. CMC executes large and complex turnkey projects, and has built, managed and supported customers' IT systems across the value chain infrastructure, applications and business processes.

CMC has 18 offices in major Indian cities and over 150 service locations. It has a sizeable resource pool of engineers trained in diverse technologies, with vast domain knowledge and varied skill sets.

CMC conducts significant research into emerging technologies and competence areas at its state-of-the-art, ISO 9001 certified R&D Centre in Hyderabad, India.

CMC has also been expanding its service presence in international markets offering off-shoring advantages and delivering value through service level-based and project scope-based deliveries. CMC's

international subsidiaries/branches include CMC Americas Inc. and CMC Informatics UK, CMC Dubai, etc. CMC's international clients include The London Underground Limited (LUL), Forth Ports and TRW in UK, National Bank of Bahrain, Syrian Railways, Tanzania Police, etc.

Vision: CMC aims to be in the global top 20 Systems Engineering and Integration Companies by 2020

Mission: As an innovative world class systems engineering and integration company, CMC shall provide sustainable, advanced technology solutions and services to their global customers and in projects of national importance, maximizing value to their stakeholders and the communities they serve.

Values: CMC shall be a vibrant organization where openness, trust, teamwork, simplicity, responsibility and innovation are valued and promoted. Being a TATA company, CMC follows the 25 clauses under the TATA Code of Conduct (TCOC).

Strategic Business Units (SBUs)

CMC's areas of business can be categorized into 5 different Strategic Business Units (SBUs):

1. System Integration (SI): Most activities of this SBU are related to Software development as per the clients' requirements.

Some of the clients are as follows:

- Bombay Stock Exchange (BSE): Transaction software with front-end and back-end support for smooth functioning of day-to-day activities.
 - Indian Railways: Online portal for reservation status, schedule and fares of trains.
2. Customer Services (CS): Activities related to customer services/support, including hardware Maintenance, Networking, Annual Maintenance Contracts (AMC), etc. Important clients include Bank of Baroda, other industries related to banking, finance, oil refineries, pharma, etc.

3. Information Technology Enabled Services (ITeS): Activities related to database management. E.g. Census Management. Recent foray into KPO and BPO business as well.
4. Education and Training (E&T): CMC is a pioneer in initiating computer education through education centers all over India. It has around 100 education centers across the country, and has completed 25 years in this field. Major activities include controlling education centers, corporate training activities, and internal training activities.
5. Embedded Systems (ES): It is the research and development wing of CMC, established recently in Hyderabad.

My Project

- My project comes under the System Integration (SI) SBU.
- I have written the database documentation and have done unit testing for Resume Management System (RMS) software.
- I have designed a user-interface for the RMS software using tools like XHTML, CSS, JavaScript, HTML5, Twitter Bootstrap etc.
- I have done Excel Sheet Parsing and Word Document Parsing in Java using Apache POI for the RMS software.
- I have also studied about how to do the Server-Side Architecture of Web Applications using Vaadin in Java on the 'Apache Tomcat' Server.

RESUME MANAGEMENT SYSTEM (RMS)

About RMS

Resume Management Module aims to digitize below manual recruitment processes in CMC.

1. To collect resumes from CMC Vendors, CMC Recruiters.
2. To search matching AOLGP request for a candidates profile.
3. To search matching candidates for an AOLGP request.
4. To link candidate to matching AOLGP request.
5. To schedule candidate interviews for linked AOLGP request's and shortlist candidates.
6. To send shortlisted candidates to E-Offer generation.

What RMS does?

- RMS can collect resumes from all CMC Vendors.
- RMS can collect resumes from all CMC HR's (Recruiters).
- Using RMS, CMC HR's can search for AOLGP requests matching with skills of the received resumes and vice versa.
- Using RMS, CMC HR's can schedule several rounds of interviews for received resumes and mark the candidates pass/fail.
- Final shortlisted candidates in RMS will automatically flow to E-Offer for offer generation.

RMS Users

Sr.No.	User Roles	What they do
1	CMC Vendors	<ul style="list-style-type: none">• Push in candidate profiles along with their resumes into RMS.
2	CMC Recruiters	<ul style="list-style-type: none">• Receive candidate profiles.• Search matching AOLGP requests for candidate profiles and vice versa.• Link candidates to AOLGP requests.• Schedule Interviews and update results.
3	AOLGP Requests Project Managers	<ul style="list-style-type: none">• To add Resume shortlist comment (shortlist/hold/reject) to linked candidates.

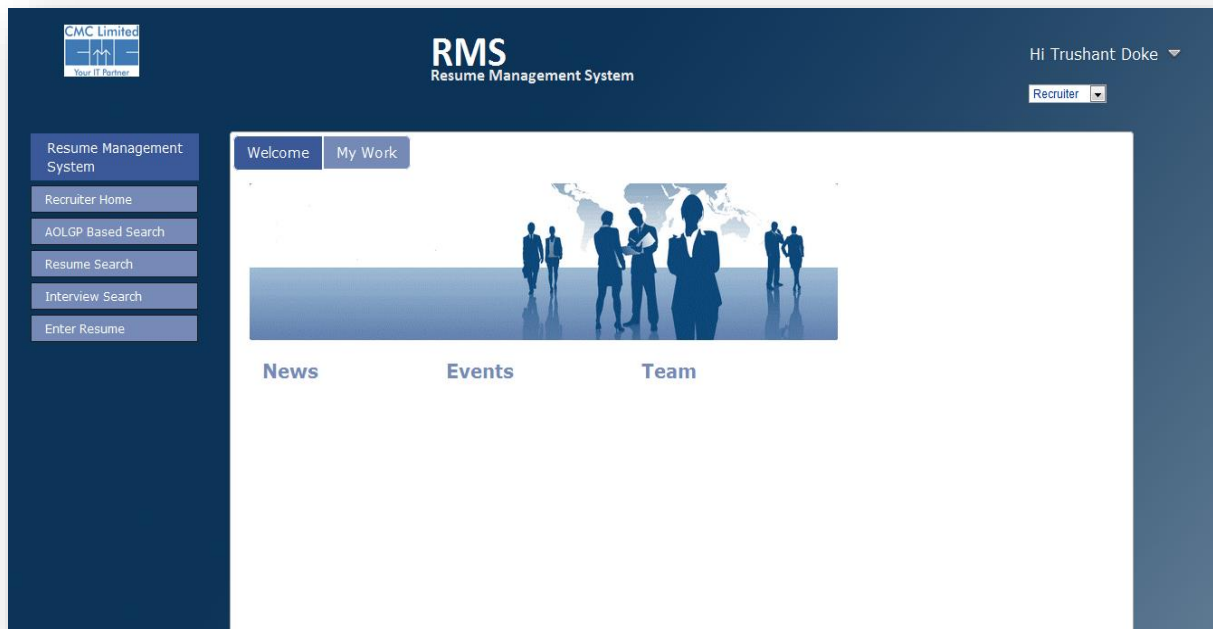


Figure 1: Screenshot of RMS Home Page (Using Graphics in Java)

A CMC recruiter can begin with recruitment process in two ways.

I. Resume driven recruitment

- i. Recruiter starts with resume.
- ii. Recruiter searches for a matching AOLGP request for resume.
- iii. Recruiter links an AOLGP request to resume.
- iv. An email with a link is sent to AOLGP requests Project Manager.
- v. Project Manager Logs into the system and adds his/her comments about linked resumes (shortlist/hold/reject).
- vi. Recruiter starts scheduling an interview for candidates marked "shortlist" by Project Manager.
- vii. Recruiter continues scheduling various interview rounds and updating their results.
- viii. If a candidate clears all interview rounds, he is marked 'Final Select' by recruiter. And his details are sent to E-Offer application for offer generation.

The screenshot displays the RMS Resume Management System interface. The header includes the CMC Limited logo, the system name 'RMS Resume Management System', and a user greeting 'Hi Trushant Doke'. A sidebar on the left contains navigation links: 'Resume Management System', 'Recruiter Home', 'AOLGP Based Search', 'Resume Search', 'Interview Search', and 'Enter Resume'. The main content area is titled '- Resume Search' and features a search form with fields for 'From', 'To', 'Qualification', 'Skill', 'Pref location', 'Email', 'Mobile', 'AOLGP ID', 'Name', and 'Source Name', along with a 'Search' button. Below the search form, a table displays search results with columns: 'AOLGP Search', 'AOLGP ID', 'Source', 'Date Received', 'Skill', 'Pref Location', 'Name', and 'Resume'. The table shows three entries, each with a checkbox, an AOLGP ID, a source name, a date, a skill set, a preference location, a name, and a resume link with an 'Edit' button.

AOLGP Search	AOLGP ID	Source	Date Received	Skill	Pref Location	Name	Resume
<input type="checkbox"/>	0	Recruiter , (Hari Chandan)	18/06/2014	Presales(4.4 Yrs) ,	All	Radha Kiranmai P	1403078201411_Radha - Presales Resume Updated.Doc radha.kiranmai@gmail.com Mob No.7795470216
	8453	Recruiter ,Interviewer , (Trushant Doke)	18/06/2014	Foundation Core Java (4.4 Yrs) ,	All	Doke Tru	1403070645344_Test Resume.Odt tru.dok@gmail.com Mob No.8796352451
	10054	Recruiter ,Interviewer , (Trushant Doke)	18/06/2014	Foundation Core Java (4.3 Yrs) ,Oracle Database(2.5 Yrs) ,	All	Test Test	1403085782270_New Microsoft Word Document.Docx shri.creativeeye@gmail.com Mob No.0123456789

Figure 2: Screenshot of RMS Resume Search Page (Using Graphics in Java)

II. AOLGP request driven recruitment

- i. Recruiter starts with an AOLGP request.
- ii. Recruiter searches for matching resumes for an AOLGP request.
- iii. Recruiter links matching resumes to an AOLGP request.
- iv. An email with a link is sent to AOLGP requests Project Manager.
- v. Project Manager Logs into the system and adds his/her comments about linked resumes (shortlist/hold/reject).
- vi. Recruiter starts scheduling an interview for candidates marked "shortlist" by Project Manager.
- vii. Recruiter continues scheduling various interview rounds and updating their results.
- viii. If a candidate clears all interview rounds, he is marked 'Final Select' by recruiter. And his details are sent to E-Offer application for offer generation.

CMC Limited
Your HR Partner

RMS
Resume Management System

Hi Trushant Doke ▾

Recruiter ▾

AOLGP request search

Approval ID: Reference: Role:
Raised date From: To: Project code:
Region: All ▾ Recruiter: -- ▾

Show 10 ▾ entries

Resume Search	Schedule	Recruiter	Approval id	Available count	Raised date	Region	Details	Requirements
		Rohini Bastkar ▾	10248	5	22/08/2013	WESTERN REGION	PM: Code:1007017 - Corporate Iis	Skills: MS Office Role: Ites- Analyst Qual: Bcom Posting Place: Mumbai
		Rohini Bastkar ▾	10248	10	22/08/2013	WESTERN REGION	PM: Code:1007017 - Corporate Iis	Skills: MS Office Role: Ites - Operations Manager Qual: Mba Posting Place: Mumbai

Figure 3: Screenshot of RMS AOLGP Based Search Page (Using Graphics in Java)

My Work

I. **Database Documentation:** Mr. Trushant Doke gave me access to the RMS Database Entity-Relationship Diagram (ERD) with the help of which I did the database documentation. Database documentation is important because it meets several needs. For example, it:

- Provides a common language between business decision makers and IT personnel - two different breeds, usually with no common language, but with a shared ability to read a nice flow chart and discuss it.
- Provides a shortcut to finding 'hot-spots' - by looking at a global functionality chart, one can easily outline the most troublesome parts of the system. In this way, educated decisions can be made about hardware and software requirements, and the outcome can be easily communicated to the financial department.
- Facilitates a 'no-panic' rule - by having proper documentation and using it, the chances of making a wrong decision are diminished because the risk is easier to assess.
- Makes maintenance easier, and reduces risk when extending or upgrading a system.
- Reduces training costs, by acting as a mediator between newcomers and existing staff. For example, when a consultant or a new hire comes to the company, having up-to-date documentation reduces the time required from the existing staff to transfer knowledge.
- Improves productivity of both newcomers and seasoned employees, reducing the likelihood of costly misunderstandings by providing a glossary of commonly used terms, naming conventions, and even commonly-used strategy patterns.

To do the database documentation, I used "Apache Open Office Writer" Software. It is an intuitive and user-friendly software. With the help of my project mentor, who gave me access to RMS and explained its functionality, I explored all the features of the software, and how it is to

be used by HR, CMC Vendors and Project Managers etc. The software also helped me gain a better understanding of the operations of a large organization like CMC, and also gave me an overview of efficient management practices using tech resources.

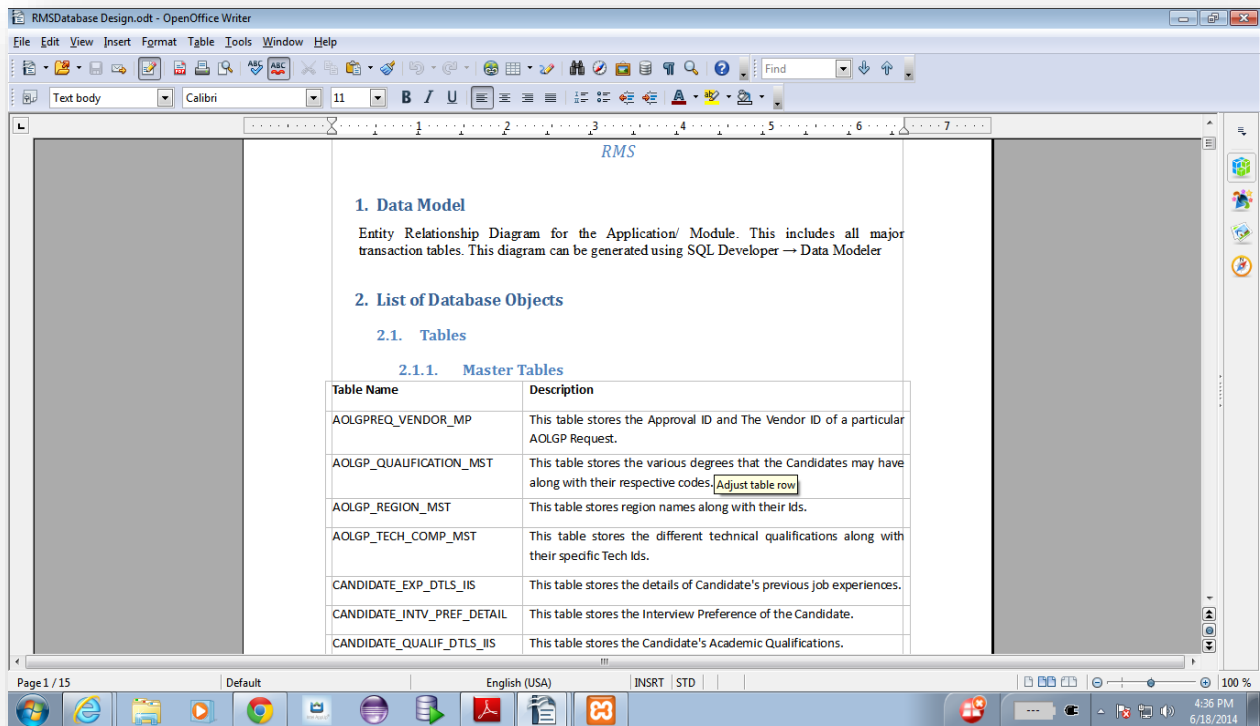


Figure 4: Screenshot of Database Documentation

II. **Unit Testing:** After my project mentor gave me access to the java code of the RMS Software, I started understanding it and also started testing each module of the software using JUnit. JUnit is a unit testing framework for the Java programming language. JUnit has been important in the development of test-driven development, and is one of a family of unit testing frameworks which is collectively known as xUnit that originated with SUnit. JUnit is a simple framework to write repeatable tests. It is an instance of the xUnit architecture for unit testing frameworks.

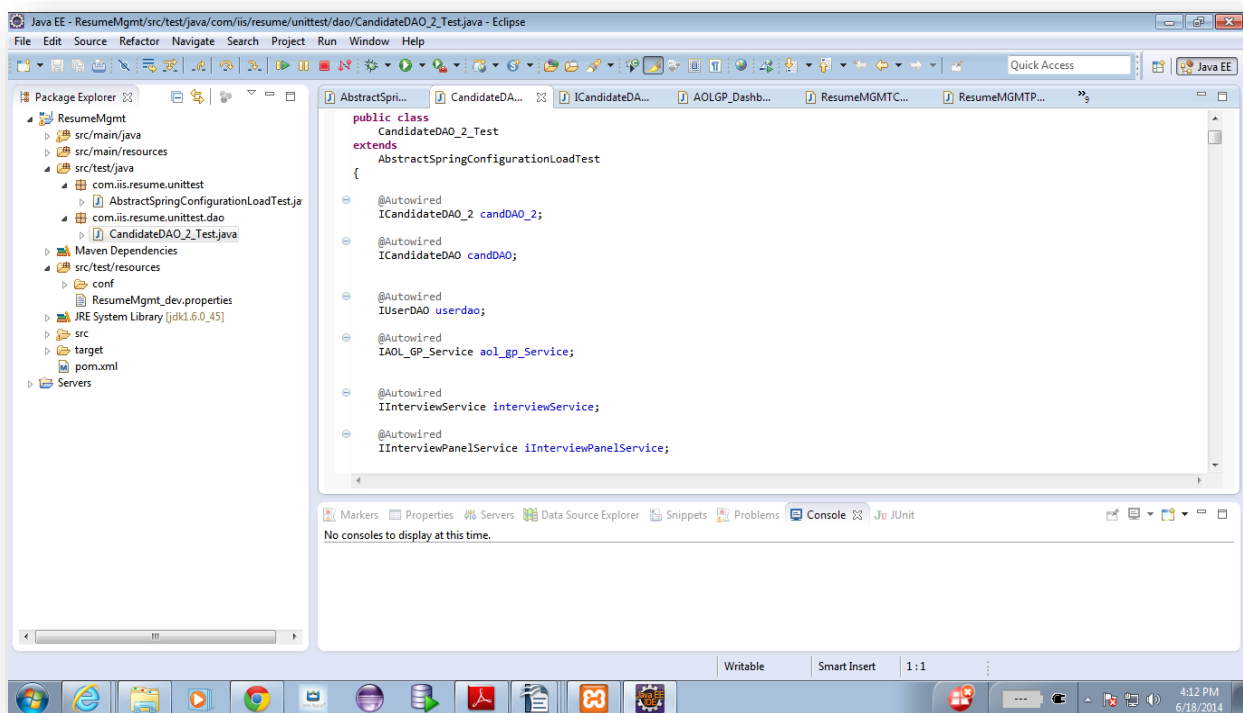


Figure 5: Screenshot of Java JUnit Code

III. **Designing User Interface:** After finishing database documentation and unit testing, I designed an user-interface for the RMS Software using the following tools:

- i. **XHTML (Extensible HyperText Markup Language)** is a family of XML markup languages that mirror or extend versions of the widely used Hypertext Markup Language (HTML), the language in which Web pages are written.
- ii. **Cascading Style Sheets (CSS)** is a style sheet language used for describing the look and formatting of a document written in a markup language. While most often used to style web pages and interfaces written in HTML and XHTML, the language can be applied to any kind of XML document, including plain XML, SVG and XUL. CSS is a cornerstone specification of the web and almost all web pages use CSS style sheets to describe their presentation.
- iii. **JavaScript (JS)** is a dynamic computer programming language. It is most commonly used as part of web browsers, whose implementations allow client-side scripts to interact with the user, control the browser, communicate asynchronously, and alter the document that is displayed. It is also being used in server-side network programming (with Node.js), game development and the creation of desktop and mobile applications.
- iv. **HTML5** is a core technology markup language of the Internet used for structuring and presenting content for the World Wide Web. It is the fifth revision of the HTML standard and is a candidate recommendation of the World Wide Web Consortium (W3C). Its core aims have been to improve the language with support for the latest multimedia while keeping it easily readable by humans and consistently understood by computers and devices (web browsers, parsers, etc.). HTML5 is intended to subsume not only HTML 4, but also XHTML 1 and DOM Level 2 HTML.

- v. **AJAX (Asynchronous JavaScript And XML)** is a group of interrelated Web development techniques used on the client-side to create asynchronous Web applications. With AJAX, Web applications can send data to, and retrieve data from, a server asynchronously (in the background) without interfering with the display and behavior of the existing page. Data can be retrieved using the XMLHttpRequest object. AJAX is not a single technology, but a group of technologies. HTML and CSS can be used in combination to mark up and style information.
- vi. **Twitter Bootstrap** is a free collection of tools for creating websites and web applications. It contains HTML and CSS-based design templates for typography, forms, buttons, navigation and other interface components, as well as optional JavaScript extensions. It is compatible with the latest versions of all major browsers. It is open source and available on GitHub.

I have made the websites mainly using twitter bootstrap, so the websites adjust their width and height according to the width and height of the device on which they are been viewed.

Some Screenshots of the User-Interface:

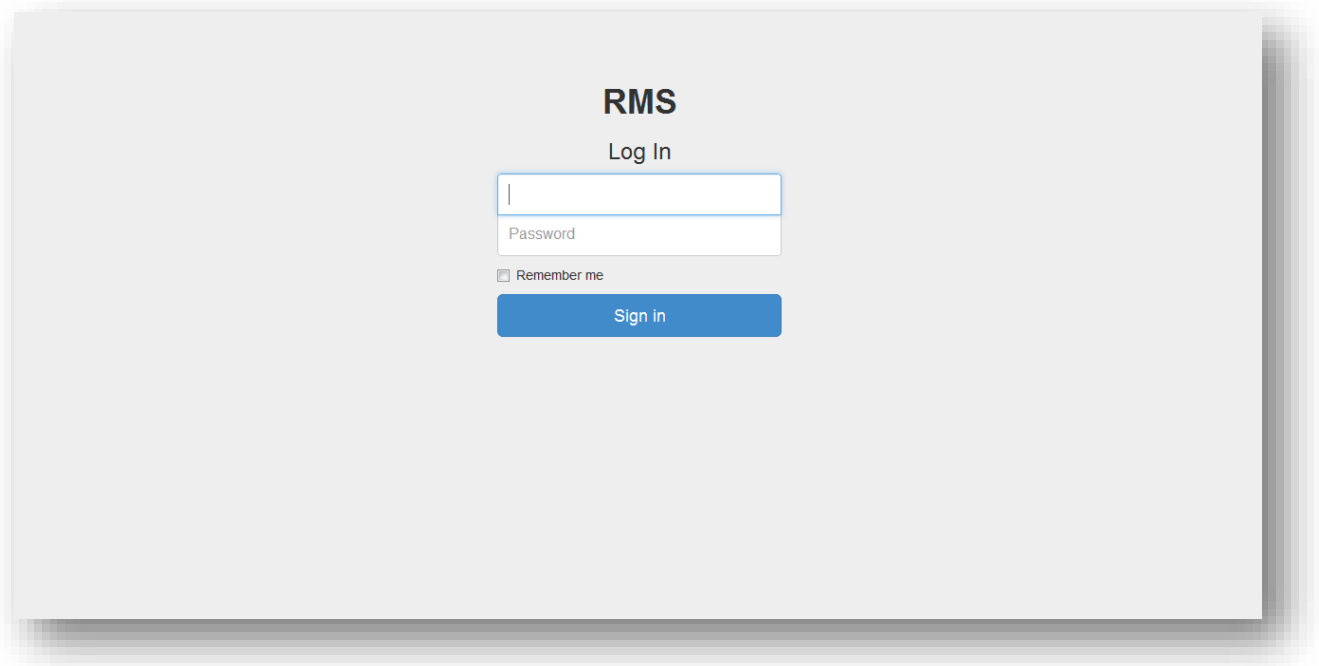


Figure 6: Screenshot of User-Interface (Log in of RMS.)



Figure 7: Screenshot of User-Interface (Home Page of RMS, after the user logs in.)

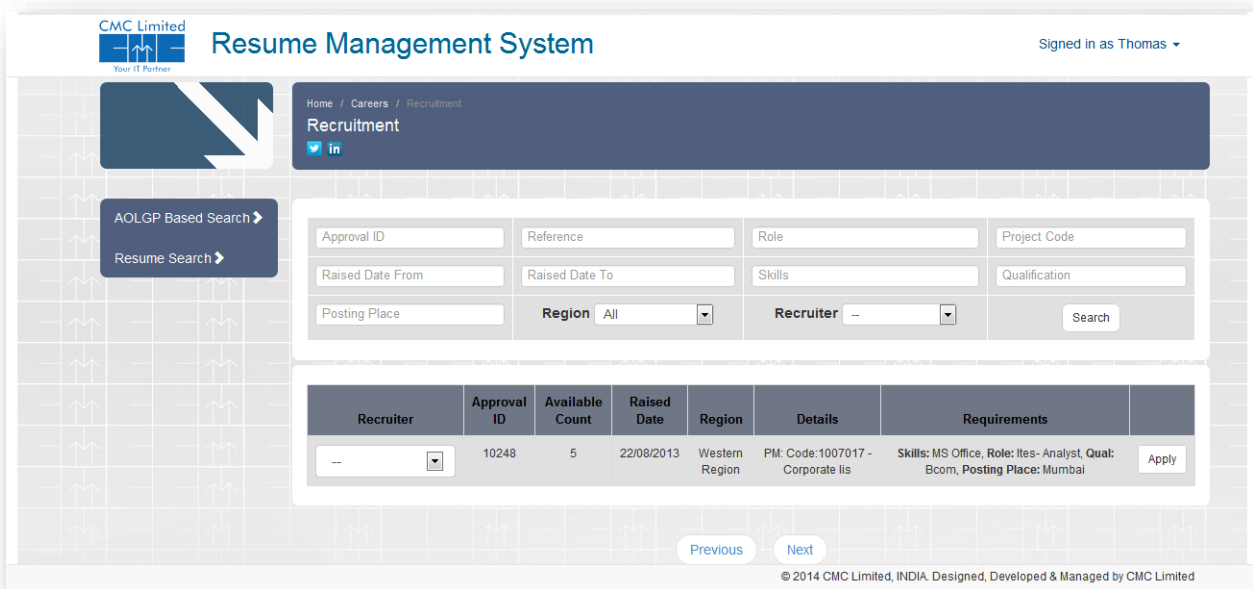


Figure 8: Screenshot of User-Interface (After the user presses AOLGP Based Search Button.)

IV. Excel Spread Sheet And Word Document Parsing: After designing the User Interface for RMS, my mentor gave me the task of designing an excel spreadsheet for taking Candidate Details from the vendors and HRs in an Excel Spreadsheet, which I designed using the "Apache Open Office Calc" Software. It was an alternative way to directly feeding the candidate details using the UI of RMS.

Personal Info						
First Name	Last Name	Date of Birth	Pan Card No.	Marital Status	Gender	Category
Rohan	Sharma	12/12/90	ZYXWV1234U	Single	Male	General
Address Details						
Address Line 1	Address Line 2	Address Line 3	City	Pin code	State	
Qtr. No. 2/3,	M.S.E.B. Colony,	Subhash Road,	Borivali(W.)	400123	Maharashtra	
Contact Details						
Mobile Number	Email	Phone(with STD)	Optional Email			
9876543210	rs@gmail.com	227654321	rs@yahoo.com			
Preference Details						
Region	Current Location	Preference Change Location	Preferable Location			
	2Thane	No				
Education Details						
Exam/Degree/Diploma	Specialization	Name Of Board/University	Duration	Year of Passing	Percentage/CGPA	
SSC / X	General	Maharashtra State Board	Full Time	2006	93.27	
HSC / XII	Science	Maharashtra State Board	Full Time	2008	96	
Graduate/Diploma	Bachelor of Engineering (BE)	BITS-Pilani	Full Time	2012	9	
Post Graduate	Master of Business Administration (MBA)	IIM-Delhi	Full Time	2014	9	
Work Details						
Organization	From Date	Employed Till Date	Last Designation	Reason for Leaving	CTC Lac	Thousand
CISCO	01/02/14	01/05/14	Junior Engineer	Far from Home	10	50
Skill Details						

Figure 9: Screenshot of Candidate Details Excel Spreadsheet

After this, my mentor gave me the task of making Candidate objects in Java using the Candidates' data in the Excel Spread Sheet, for which I used the "Apache POI" Software and did the java coding in the "Eclipse IDE (Integrated Development Environment)" Software.

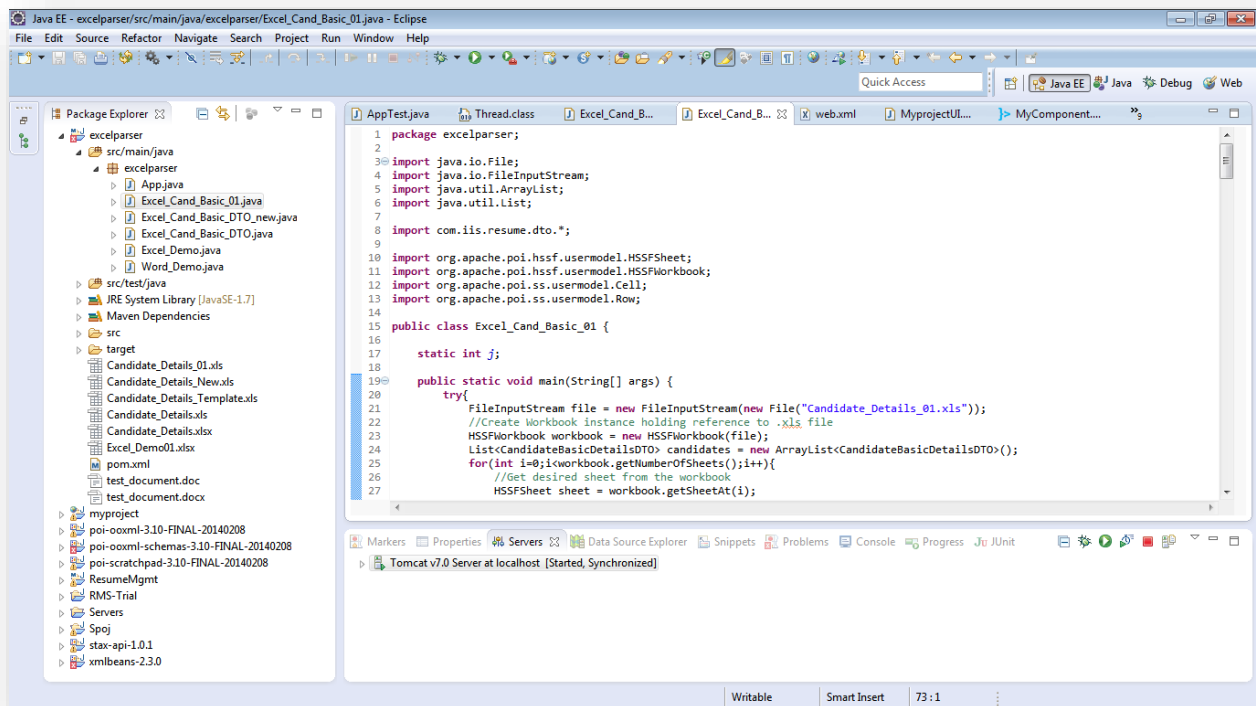


Figure 10: Screenshot of Excel Spread Sheet Parsing Java Code

Apache POI (Poor Obfuscation Implementation) is a project run by Apache Software Foundation. It provides pure Java libraries for reading and writing files in Microsoft Office formats, such as Word, PowerPoint and Excel.

Apache POI Architecture: The Apache POI project contains the following sub-components (meaning of acronyms is taken from old documentation):

- POIFS (Poor Obfuscation Implementation File System) – This component reads and writes Microsoft's OLE 2 Compound document format. Since all Microsoft Office files are OLE 2 files, this component is the basic building block of all the other POI elements. POIFS can therefore be used to read a wider variety of files, beyond those whose explicit decoders are already written in POI.

- HSSF (Horrible SpreadSheet Format) – reads and writes Microsoft Excel (XLS) format files. It can read files written by Excel 97 onwards; this file format is known as the *BIFF-8* format. As the Excel file format is complex and contains a number of tricky characteristics, some of the more advanced features cannot be read.
- XSSF (XML SpreadSheet Format) – reads and writes Office Open XML (XLSX) format files. Similar feature set to HSSF, but for Office Open XML files.
- HPSF (Horrible Property Set Format) – reads "Document Summary" information from Microsoft Office files. This is essentially the information that one can see by using the *File/Properties* menu item within an Office application.
- HWPF (Horrible Word Processor Format) – aims to read and write Microsoft Word 97 (DOC) format files. This component is in initial stages of development.
- HSLF (Horrible Slide Layout Format) – a pure Java implementation for Microsoft PowerPoint files. This provides the ability to read, create and edit presentations (though some things are easier to do than others)
- HDGF (Horrible DiaGram Format) – an initial pure Java implementation for Microsoft Visio binary files. It provides an ability to read the low level contents of the files.
- HPBF (Horrible PuBlisher Format) – a pure Java implementation for Microsoft Publisher files.
- HSMF (Horrible Stupid Mail Format) – a pure Java implementation for Microsoft Outlook MSG files.
- DDF (Dreadful Drawing Format) – a package for decoding the Microsoft Office Drawing format.

After this, my mentor gave me the task of creating a Candidate Object in Java by parsing the data in the Candidate's Resume, which would be a Word Document. For this task also, I used "Apache POI" Software and did the java coding in the "Eclipse IDE (Integrated Development Environment)" Software.

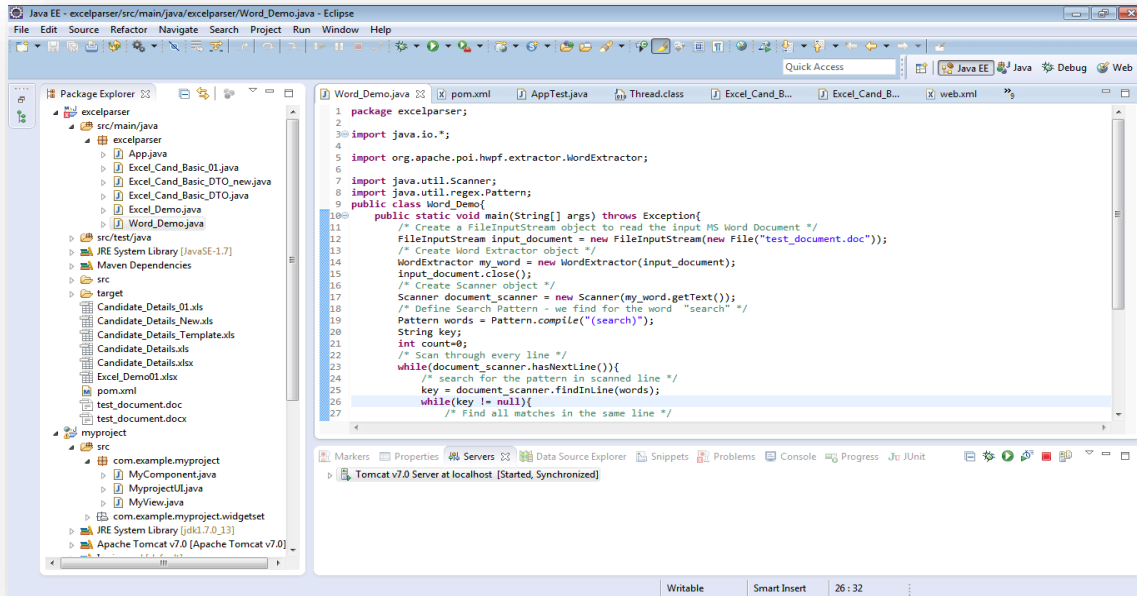


Figure 11: Screenshot of Word Document Parsing Java Code

V. **Server Side Architecture of Web Application:** After completing the task of Excel Spread Sheet Parsing and Word Document Parsing, my mentor gave me the task of studying the Server Side Architecture of Web Applications using Vaadin.

Vaadin is an open source Web application framework for rich Internet applications. In contrast to JavaScript libraries and browser-plugin based solutions, it features a server-side architecture, which means that the majority of the logic runs on the servers. Ajax technology is used at the browser-side to ensure a rich and interactive user experience. On the client-side, Vaadin is built on top of and can be extended with Google Web Toolkit (GWT).

Vaadin uses Java as the programming language for creating web content. The framework incorporates event-driven programming and widgets, which enables a programming model that is closer to GUI software development than traditional web development with HTML and JavaScript.

Vaadin uses Google Web Toolkit for rendering the resulting web page. While, the way Vaadin uses Google Web Toolkit could lead to trust issues – it only operates client-side (i.e., in a web browser's JavaScript engine) – Vaadin adds server-side data validation to all actions. This means that if the client data is tampered with, the server notices this and doesn't allow it.

Vaadin's default component set can be extended with custom GWT widgets and themed with CSS.

Vaadin is distributed as a collection of JAR files (either as direct downloads, or with Maven or Ivy integration), which can be included in any kind of Java web project developed with standard Java tools. In addition, there exist Vaadin plugins for the Eclipse IDE and NetBeans for easing the development of Vaadin applications as well as direct support of (and distribution) through Maven.

Vaadin applications can be deployed as Java servlets for any Java web server, including Google App Engine. Applications can also be deployed as portlets to any Java portal like eXo Platform. Vaadin also has some deeper integration with the Liferay Portal.

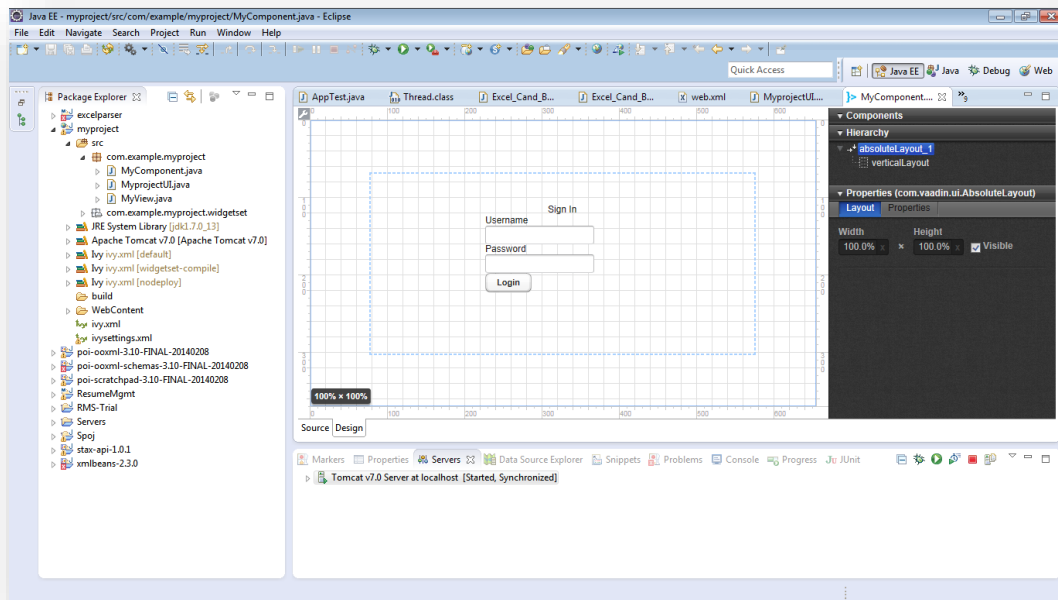


Figure 12: Screenshot of Vaadin UI Design in Eclipse IDE

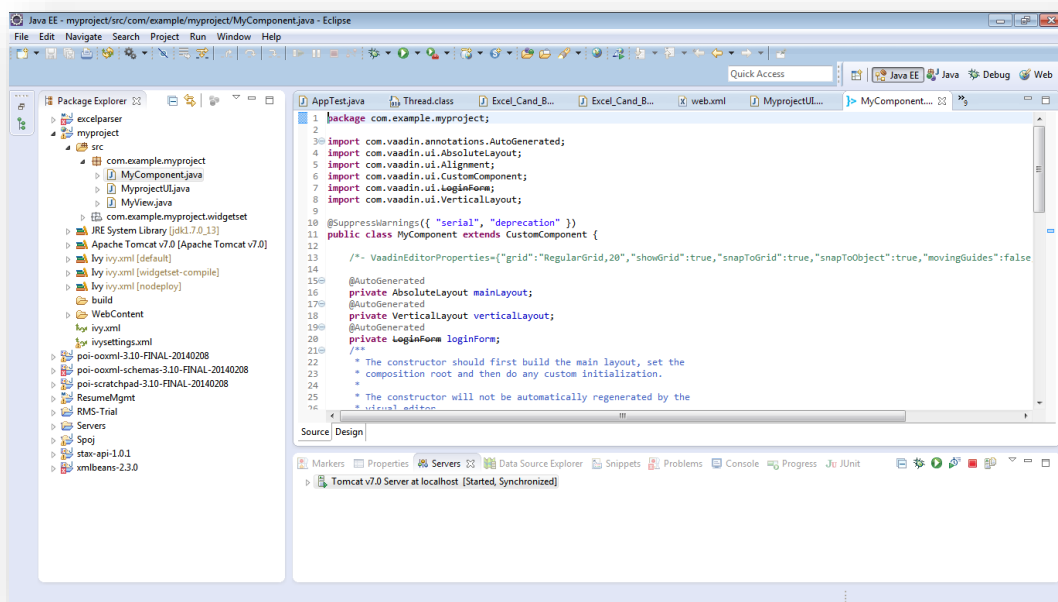


Figure 13: Screenshot of Vaadin UI Source Code in Eclipse IDE

CONCLUSION

After providing assistance to my project mentor, Mr. Trushant Doke, on the RMS Software, I explored all the features of the RMS software, and how it is to be used by HR, CMC Vendors, Project Managers etc. I learned how to do the database documentation of a software. I also learned how to test the various modules of a software using JUnit. I learned how to create screen size adjusting user-interfaces for software using HTML, CSS, JavaScript, Twitter Bootstrap etc. I learned how to parse Excel Spread Sheet and Word Documents using Apache POI. I also learned about the Server-Side Architecture of Web Application using software tool like Vaadin. The software also helped me gain a better understanding of the operations of a large organization like CMC, and also gave me an overview of efficient management practices using tech resources.

SCOPE

Future work would involve writing unit test codes for some components of the RMS software for which the unit test code has not been written. The User Interface Design can also be improved by using some good twitter bootstrap themes and also linking the User Interface with the Databases. The design of the Excel Spread Sheet could be improved and the corresponding Java Code for Excel Spread Sheet Parsing could be modified accordingly.

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- HTML5. Available at: <http://www.w3.org/TR/html5/>
- AJAX. Available at: <http://www.asp.net/ajax>
- Twitter Bootstrap. Available at: <http://getbootstrap.com/>
- Eclipse IDE. Available at: <http://www.eclipse.org/>
- Apache POI. Available at: <http://poi.apache.org/>
- Vaadin. Available at: <https://vaadin.com/home>
- Apache Tomcat. Available at: <http://tomcat.apache.org/>

GLOSSARY

TERM	MEANING	PAGE NUMBERS
AJAX	Asynchronous JavaScript And XML.	18, 24, 28.
AOLGP Request	A request which is given by Project Manager, regarding the skills which they want in the candidates, they are hiring.	6, 10, 11, 12, 13, 19.
Apache Tomcat	An open source web server and servlet container developed by the Apache Software Foundation (ASF).	4, 9, 28.
CSS	Cascading Style Sheets.	4, 9, 17, 18, 24, 26, 28.
DDF	Dreadful Drawing Format.	20.
Eclipse IDE	Eclipse is an integrated development environment (IDE). It contains a base workspace and an extensible plug-in system for customizing the environment.	6, 20, 23, 24, 25, 28.
Google App Engine	A cloud computing platform for developing and hosting web applications in Google-managed data centers.	24.
GWT	Google Web Toolkit. It is an open source set of tools that allows web developers to create and maintain complex JavaScript front-end applications in Java.	24.
HDGF	Horrible DiaGram Format.	20.
HPBF	Horrible Publisher Format.	20.
HPSF	Horrible Property Set Format.	20.
HR	Human Resource.	3, 10, 15, 20, 26.
HSLF	Horrible Slide Layout Format.	20.
HSMF	Horrible Stupid Mail Format.	20.
HSSF	Horrible Spread Sheet Format.	19.
HWPF	Horrible Word Processor Format.	20.
Ivy	A transitive relation dependency manager.	24.
JAR	Java ARchive. A package file format typically used to aggregate many Java class files and associated meta data and resources (text, images, etc.) into one file to distribute application software or libraries on the Java platform.	24.
Java Servlet	A Java programming language class used to extend the capabilities of a server.	24.
JS	JavaScript.	4, 9, 17, 18, 24, 26, 28.
JUnit	JUnit is a unit testing framework for the java programming language.	6, 16, 26, 28.
Liferay Portal	A free and open source enterprise portal project written in Java.	24.
Maven	A build automation tool used primarily for Java projects.	24.
NetBeans	An integrated development environment (IDE) for developing primarily with Java.	24.
OLE	Object Linking and Embedding is a proprietary technology developed by	21.

	Microsoft that allows embedding and linking to documents and other objects.	
POIFS	Poor Obfuscation Implementation File System.	19.
Portlet	A pluggable user interface software components that are managed and displayed in a web portal.	24.
RMS	Resume Management System.	4, 5, 6, 9, 10, 11, 12, 13, 14, 16, 17, 18, 19, 20, 26.
UI	User Interface.	6, 20, 25.
Web Browsers	A software application for retrieving, presenting and traversing information resources on the World Wide Web.	17, 24.
Web Portal	One specially-designed Web page which brings information together from diverse sources in a uniform way.	8, 24, 29.
Web Widget	A small application with limited functionality that can be installed and executed within a web page by an end user.	24.
XHTML	Extensible Hyper Text Markup Language.	4, 9, 17, 28.
XSSF	XML Spread Sheet Format.	20.