ADOBE EXPERIENCE MANAGER
(ENTERPRISE CONTENT MANAGEMENT SYSTEM)

Project report submitted in fulfilment of the requirement for the degree of Bachelor of Technology

in

Computer Science and Engineering/Information Technology

By

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Under the Supervision of

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to

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DECLARATION BY THE SCHOLAR

I hereby declare that this project report titled '**Adobe Experience Manager (Enterprise Content Management System)**' in fulfilment of the requirements for the award of the degree of **Bachelor of Technology** in **Computer Science and Engineering/Information Technology** submitted in the department of Computer Science & Engineering and Information Technology, at **Jaypee University of Information Technology, Waknaghat, Solan** is an authentic record of my work carried out under supervision of **Dr. Geetanjali Rathee .** I have not submitted this work elsewhere for any other degree or diploma. I am fully responsible for the contents of my B.Tech. Industrial Project.

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May, 2020

SUPERVISOR'S CERTIFICATE

This is to certify that the work reported in BTech. Industrial Training entitled **"Adobe Experience Manager (Enterprise Content Management System)"** submitted by **Munish Thakur** at **Jaypee University of Information Technology, Waknaghat, India** is a bonafide record of his original work carried under my supervision. This work has not been submitted elsewhere for any other degree or diploma.

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ArgilDX , Noida, India

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ACKNOWLEDGEMENT

I was provided this great opportunity to work at Argil DX that helped me put my theoretical learning in use and learn professional development. I would like to express my deepest gratitude and special thanks to the founder and CEO of the company Mr. Ankur Mittal who despite of being extraordinarily busy with his duties, took time out to hear, guide and keep me on the correct path of learning and developing.

I express my deepest thanks to Mr. Pankaj Bansal, Managing Partner for taking part in useful decision & giving necessary advices and guidance and arranged all facilities in the office.

It is my radiant sentiment to place on record my best regards, deepest sense of gratitude to my mentors, Mr. Nishant Gupta, Vice President, Mr. Arpit Rathi, Software Developer, Mr. Abhinav Aggarwal, Software Developer for their careful and precious guidance which were extremely valuable for my study both theoretically and practically.

I would also like to acknowledge guidance of my institute mentor, Dr. Geetanjali Rathee who constantly guide me during my internship and suggest me to improve on every aspect.

ABOUT THE COMPANY (Argil DX)

Argil DX is a new age digital services start-up which focuses to uniquely combine client's idea and requirement with power of Technology, Analytics, Marketing, & Content for digital transformation. Being a reliable web design agency, ArgilDX transforms your vision into brand building promotional entity. The company stroke down the best ideas or start from a blank page to engineer an artefact enabling the client to entice the intended audience [3]. The web application developers fabricate technically complex yet professional and innovative web solutions and services that infuse utmost prospective of the latest web technologies to generate an interactive and appealing plea for your patrons. We are most mindful of your business objectives, goals and expectations during development. Argil DX's support team is always ready to handle issues, and keep our customers up and running 24×7 and meet all kind of challenges. Our meaning of support is to go hand in hand with our customers and help them gain maximum value from our services.

ABSTRACT

During my internship duration in Argil DX . I received training for one month on different kinds of tools and technologies used in the project managing the CMS for our clients. After the completion of training, I got the opportunity to work in a live project. I was assigned various tasks under the project that helped me improve technical skills of Java coding, HTML and CSS basic introduction, learning of Git and Maven, JavaScript and other such technologies. Our organization uses Agile Scrum methodology, Thus the entire project is divided into different sprints which in turn contain various stories and bugs to be completed and my task was to complete some of the stories in each sprint. Meanwhile, I learned real world application of my theoretical knowledge. I also learnt making of components that render on the web pages and present the final website. I learnt about various kind of Forms and different ways to create them. I learnt to use front end logic with the back end code and integrate them together to display the final output to the users.

LIST OF ACRONYMS / ABBREVIATIONS

AEM	Adobe Experience Manager
CMS	Content Management System
CTA	Call To Action
DOM	Document Object Model
URL	Uniform resource Locator
VCS	Version Control System
WCM	Web Content Management
API	Application Program Interface
ECM	Enterprise Content Management
CSS	Cascading Style Sheet
ECMA	European Computer Manufacturers Association
JCR	Java Content Repository
XSS	Cross Site Scripting
JSON	JavaScript Object Notation
POJO	Plain Old Java Object
DAM	Digital Asset Management
OOB	Out Of the Box
OSGI	Open Services Gateway Initiative
POC	Proof Of Concept
POM	Project Object Model
REST	Representational State Transfer
HTL	HTML Templating Language

MIME	Multi-purpose Internet Mail extension
MVCC	Multi Version Concurrency Control
HTTP	HyperText Transfer Protocol
SEO	Search Engine Optimization
UI	User Interface

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CHAPTER 1
INTRODUCTION

1.1. INTRODUCTION

A CMS is an application that has programs and relatable logics and are used in the management and creation of content in digital experience. They work mainly in 2 ways named as website content management (WCM) and enterprise content management (ECM). CMS helps in providing a straightforward, accessible, transparent and reliable web page for the maximum clients which is used in the end addition of contents to a web page to be present in a high structured way and smart usage of components there [13]. Hence, the gist of what a CMS is that it helps standard content to be present in any web page in a great way. Adobe Experience Manager (AEM) is nothing but an extension to the CMS which is actually a webpage-based server-client structural system created and used for creating, storing, building, deploying as well as managing a high technology league of websites that are running commercially. It is module-based and a package for application level features and functionalities and several infrastructure .AEM structure comprises of some building blocks namely:

• **Webapp Structure/Framework:** AEM lives on the Sling Framework doing a job to communicate structure that redefines the making of API based on REST.

• **Webapp Server:** AEM can be used either as a stand-alone mode using a Jetty web server integrated within and on an online application that lives inside 3rd-party application servers like WebSphere, WebLogic, etc.

• **Central Database**: Java content repository or JCR is provided in AEM as for the use of hierarchical databases specially created and designed for taking care of data that is semi-structured as well as unstructured data. This repository saves the client digital content which is going to be on the web site, along with all the code, templates, pages, internal information as well as attachment information used by the user.

AEM provides amicable range of web based features and applications for the usage of different type of web pages deployed in this recent time including facilities like AEM Websites, AEM’s Phone Apps, Digital experience Publications, Communities, DAM, Forms based on , internet based Commerce [10]. AEM works on java and java is platform independent It can work on any OS. Webpage systems created through AEM (which is a CMS) has a highly bundled, decoupled (loosely coupled) as well as a structure where each and every bundle created could be an OSGI bundle (it is a jar with data about data (metadata) with it)- This can either be given in a default AEM module or personalized modules for personalized editable functions. The complete structure of the web page system is created using existing as well as available components or even personalized components. Adobe Experience Manager provides a really amazing authoring which is similar to publishing experience for users that show their utter most satisfaction and adds to their value of the business project. Adobe Experience Manager gets installed on any working computer system which usually involves installation of at least 2 modes on different port numbers. They are different environments like testing, publish, author etc that any machine can handle, usually on different systems. Author Instance: this is an AEM instance that helps you create, update, edit, upload etc to basically for the major content on the web page. This is all done by giving the user the admin functionalities. The content here is finalized before going to any other environments. Once content is stated final and approved, it is prepared to travel live, it’s duplicate is created and posted on the opposite publish mode. Publish Instance: this is an AEM instance that provides the end result on the web page to the users of the web page system. This works within the modular bundle called osgi bundles that shows changes done to any bundle is immediately shown on the page[3] without producing even a small latency.

1.2. PROBLEM STATEMENT

Client has been, traditionally, using paper schedule to collect information in its surveys. This leads to various drawbacks like larger processing times, problems in data scrutiny and transcription, higher costs etc.

1.3. PRESENT SYSTEMS AND THEIR SHORTCOMINGS

Currently client has been using paper forms for conducting their survey. These forms were later compiled back together at a central station and then further newer survey forms were developed on the basis of previous forms and then these new forms were also redistributed for survey and recompiled, after which results were drawn out for the surveys on the basis of all the compiled information at a single place. Collection of information through paper schedule suffers from a plethora of disadvantages:

- **Longer processing time:** Since the forms are paper forms they need to be transcribed and compiled thus a long processing time is caused due to data transcription
- **Accuracy and quality of the data:** Since the paper forms were filled by individuals and there is no form of validation , moreover no two users fill the form in the exact same format there is always a loss in accuracy and quality of data.
- **Execution of data scrutiny**: Execution of data scrutiny requires a lot of manual effort and requires lots of time , since scrutinizing data and organizing it in different formats requires lots of manual work and is highly dependent on the speed of the users.
- **Validation program:** The validation process subsequent to data transcription in paper forms takes a lot of time. Since each of the fields in the form had to be manually validated by a separate user.
- **High Cost:** The cost associated with maintain survey forms and training users for manually completing various processes in the forms like data scrutiny, transcription, validation is very high.
- **Non eco-friendly**: Since for every new location and every area to be surveyed in that location new forms were required, moreover various different forms were also to be filled depending on the previously filled forms and if there is an error in some important fields in the form the whole form has to be discarded a lot of paper was used and wasted which is non eco-friendly.

All these result in delay in bringing out the results of the survey.

1.4. SCOPE OF THE PROJECT

The scope of the project is to develop a web portal and android application to run and manage surveys conducted by the client. This would provide them immediate and fast access to all the forms and help monitor their progress at various stages in the form lifecycle. The mobile application requires the capabilities to operate in offline mode and then sync later as per availability of network. End goal of the system is to create generic survey solution so that there was minimum dependency on the code implementation.

CHAPTER 2

LITERATURE SURVEY

2.1. GIT

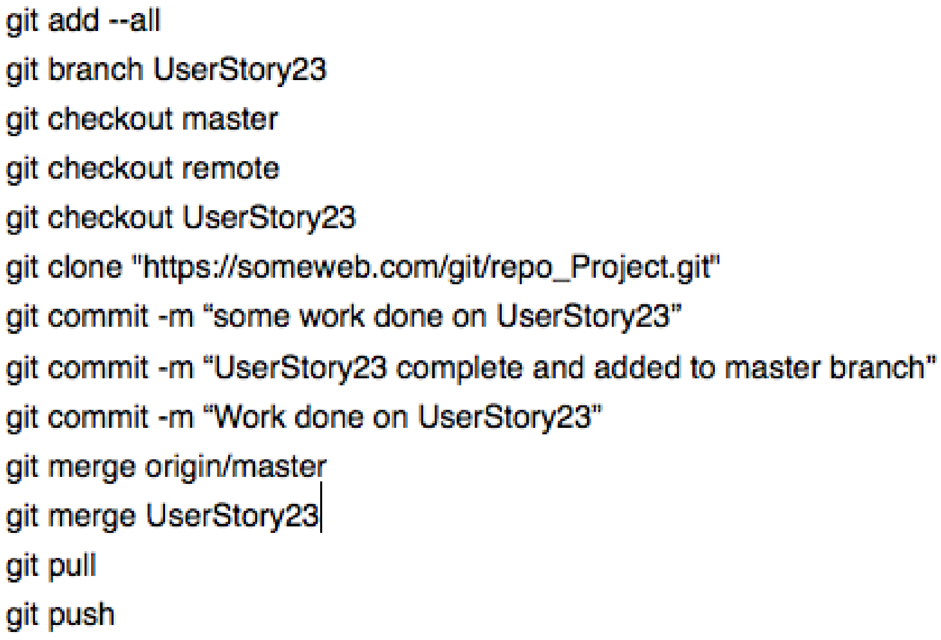
A type of distributed version control system (VCS) is Git, which is helpful to track every change made to the project such as creation, modification, deletion [3] etc. It is helpful for developers operating from different geographical locations pertaining to a project work on those files which can be distributed and linked with git repository. It monitors and records the changes made to files that need to be tracked, but it's main focus lies in software development and tracking. Also utilized for distributed revision control, git's focus lies at data integrity, improved productivity, support for all the distributed, modular, structural, non-linear workflows and speed. Thi Git directory that is created on a machine is like a full-fledged repository (storehouse) having detailed history and log and full capability for version tracking which does not require any connection with a central server or internet.

The main states included in Git for the files are: staged (tracked changes), modified (untracked changes), and committed (ready to be sent) [3]. Committed implies the data is final and is stored securely on your machine's database and can be directly uploaded to the final repository. Modified is a state in which the developer has made some changes to the project but has not saved (committed) it to the machine's local database until yet. In 'Staged' state, the developer developing the file markers or flags a modified file (deleted, created, or modified file) in its present version in a locally created repository and proceeds to the next commit snapshot (which can be central or remote repository).

A vast array of options for Git command can be applied for working on projects, ranging from very small to large, that utilize git and also manage it easily project-wide.

- To create an empty Git repository in your local machine: **git-init** - a local, hidden folder named ".git" is created in the present working directory.
- To add the modified files to staging/queue to commit at a later point in time: **git-add** - files don't get committed at this point, but only get added so they can be tracked by the Git file system.

- To commit the files previously added to the queue: **git commit** - a new revision is created with a log, and also, syncs the changes to the remote repository.
- To move/switch among the active branches: **git checkout**
- To create a new branch: **git checkout -b branch_name** - where branch_name is the name on local repository (local machine)
- To obtain the current status: **git status**.
- To fetch a log detailing all the previous commits: **git log** - commit message, commit id, time, name and every detail record.
- **git remote add origin** – sets path path github repository. The repository contains the codes which need to be committed. “origin” is a variable having the url of the remote git repository where the code needs to be uploaded and aligned to the project.
- To fetch the last code/version from the specified branch “branch_name”: **git pull origin branch_name**.
- To send the changes to the remote repository branch: **git push origin branch_name** - creates a new branch if not already present.
- To save all the changes made in the current branch, so as to safely switch between the branches: **git stash**.



```
git add --all
git branch UserStory23
git checkout master
git checkout remote
git checkout UserStory23
git clone "https://someweb.com/git/repo_Project.git"
git commit -m “some work done on UserStory23”
git commit -m “UserStory23 complete and added to master branch"
git commit -m “Work done on UserStory23”
git merge origin/master
git merge UserStory23
git pull
git push
```

Fig. 2.1 Various Git commands

Many other commands, depending on the use case, are useful such as rebase, reflog, reset etc, are also present in git.

2.2. MAVEN

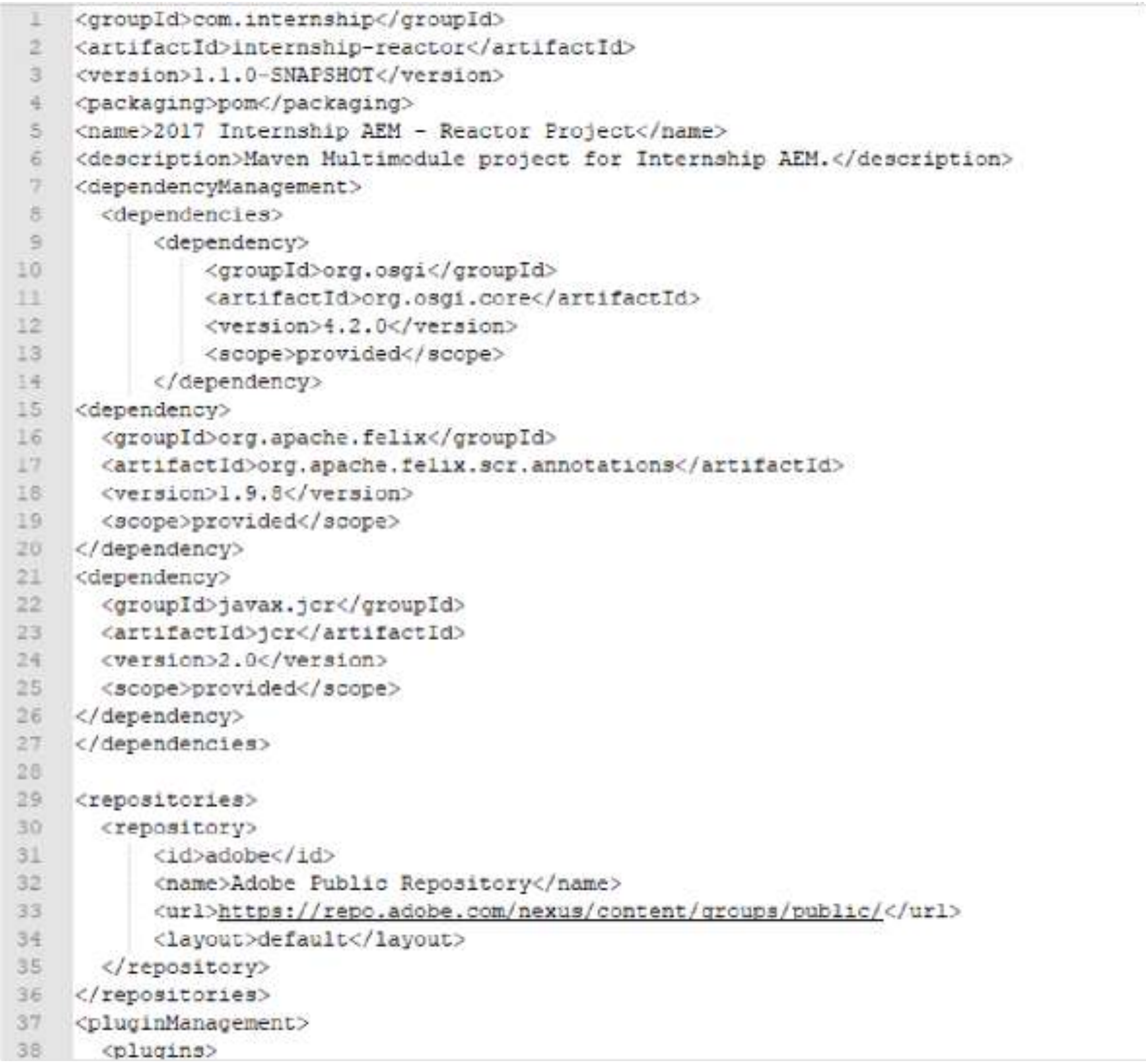
Apache Maven is tool for project management. It is based on the concept of project object model and it is utilized for the assignments of venture's work just as reliance goals. A structure device takes care for everything from code compilation to defining the structure of a project. This tool first compiles all the files in the project structure and the install and make these files into bundles which are managed by the osgi bundles lifecycle.

If any errors are faced while building the file then we can find the error source file with specific command and after rectifying those mistakes we can again run the command to compile all the files and resume our work.

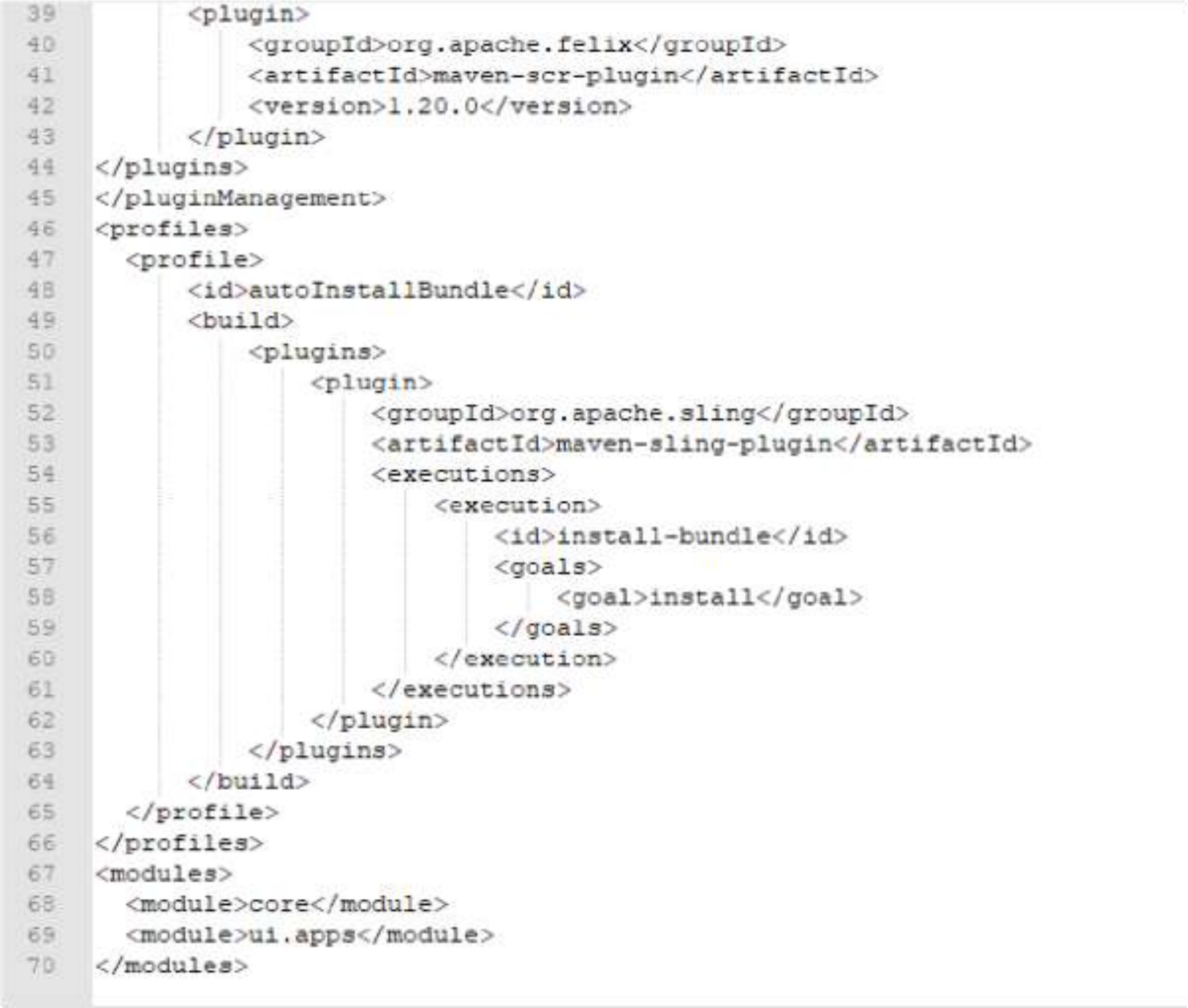
Maven has a local repository where it stores the dependencies and plugins used and if it does contain those dependencies then it fetches it from a central repo and stores it in a local repository.

Maven follows a build life cycle which is as follows:

- Validate
- Compile
- Test
- Package
- Integration Test
- Verify
- Install
- Deploy



```
<groupId>com.internship</groupId>
<artifactId>internship-reactor</artifactId>
<version>1.1.0-SNAPSHOT</version>
<packaging>pom</packaging>
<name>2017 Internship AEM - Reactor Project</name>
<description>Maven Multimodule project for Internship AEM.</description>
<dependencyManagement>
  <dependencies>
      <dependency>
          <groupId>org.osgi</groupId>
          <artifactId>org.osgi.core</artifactId>
          <version>4.2.0</version>
          <scope>provided</scope>
      </dependency>
<dependency>
  <groupId>org.apache.felix</groupId>
  <artifactId>org.apache.felix.scr.annotations</artifactId>
  <version>1.9.8</version>
  <scope>provided</scope>
</dependency>
<dependency>
  <groupId>javax.jcr</groupId>
  <artifactId>jcr</artifactId>
  <version>2.0</version>
  <scope>provided</scope>
</dependency>
</dependencies>

<repositories>
  <repository>
      <id>adobe</id>
      <name>Adobe Public Repository</name>
      <url>https://repo.adobe.com/nexus/content/groups/public/</url>
      <layout>default</layout>
  </repository>
</repositories>
<pluginManagement>
  <plugins>
```



```
      <plugin>
          <groupId>org.apache.felix</groupId>
          <artifactId>maven-scr-plugin</artifactId>
          <version>1.20.0</version>
      </plugin>
</plugins>
</pluginManagement>
<profiles>
  <profile>
      <id>autoInstallBundle</id>
      <build>
          <plugins>
              <plugin>
                  <groupId>org.apache.sling</groupId>
                  <artifactId>maven-sling-plugin</artifactId>
                  <executions>
                      <execution>
                          <id>install-bundle</id>
                          <goals>
                              <goal>install</goal>
                          </goals>
                      </execution>
                  </executions>
              </plugin>
          </plugins>
      </build>
  </profile>
</profiles>
<modules>
  <module>core</module>
  <module>ui.apps</module>
</modules>
```

Fig. 2.2. POM.xml

From the above snippet of the code, properties like group id, dependencies, version, artifact id, modules, repositories, plugins etc are saved in a parent’s POM.xml file. Any Maven project requires this main file to complete the build functionalities and run. Another file, child POM or apps and core have a likewise architecture and design, only difference being that it does not declare the scope or the version.

Source code is deployed and built using all the properties of POM.xml and also fulfils the task of a management tool.

2.3. AEM (ADOBE EXPERIENCE MANAGER)

Adobe experience manager is a tool that gives a us more liberty to change the content of a website without making any changes to the code base [3]. It comprises of many libraries, api, and framework which allows easy management of a project and at the same time provides us many features for a wide range of components (inbuilt as well as user made components) to fulfill any clients demands.

As any of the previous frameworks like tomcat, etc. It provide us with a feature where every part of a program (known as bundles) can act independently.

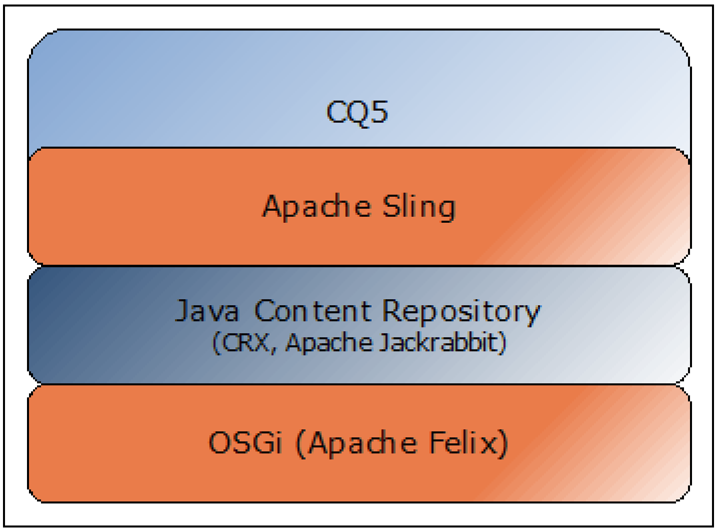


Fig 2.3: Stack

Adobe experience manager empowers web and portable applications to be worked in a manner that is snappy, simple and repeatable. Utilizing this structure, associations can construct web apps, responsive sites, versatile applications and structures. It contains some extremely valuable highlights, similar to formats with predefined designs, or the capacity to install standard and exceptionally manufactured segments that show content from its digital asset manager.

We will probably not just assist associations with capitalizing on AEM applications, yet additionally give knowledge on the best way to work inseparably with a Quality Engineering (QE) approach. The information inside AEM (client made information, site information, custom information) is put away in the crx, which is a specification executed as Oak. It is a vault actualized by Jackrabbit. Oak is execution of an adaptable and various leveled content utilized for websites.

Adobe experience manager works upon a framework which works upon a principle which treats a project file as a combination of small modules. Each module is independently executed and if any of the module fails we can stop that module individually and make the changes accordingly, whereas the rest of the application runs as an independent comodity.

Each module in AEM known as a bundle goes through a lifecycle which is handled by the OSGI bundle. Its lifecycle involves:

- Installed
- Resolved
- Starting
- Active
- Stopping
- Uninstalled

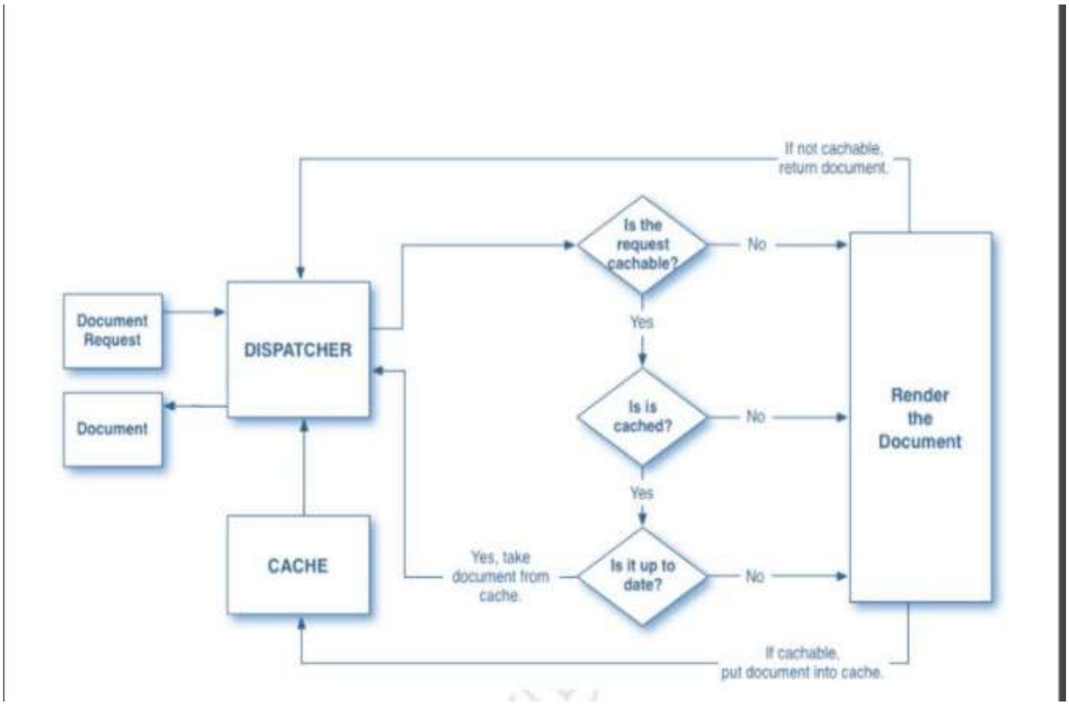


Fig 2.4 Dispatcher

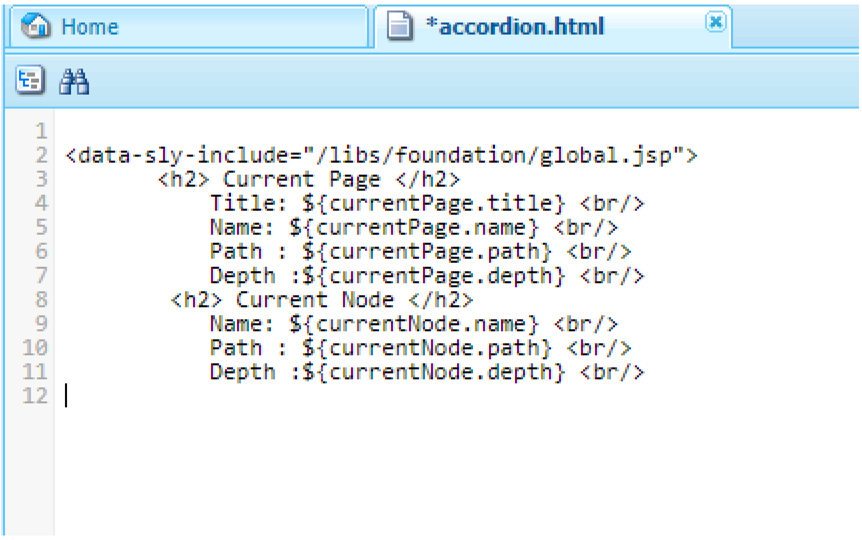
2.4. HTL (HTML TEMPLATING LANGUAGE)- SIGHTLY

HTML template's language, which is support by (AEM) like a template, (HTL) purpose is, is to provide a business-friendly framework on web which maximizes safety that is compared to the javascript files usage previously, and allows HTML developers to host and take part in AEM projects and interact with java without much language technical knowledge.

The HTML template language is introduced in AEM 6.0 only, and replaces Jsp (Javaserver pages) as the recommended Server-Side html information system also at the end of deployment. Designed for website developers, to built powerful businesses and company websites, such as Sightly. HTML Template language helped to achieve safety and is efficient. Benefits of being small includes weightlessness - lack of dependency, quickness to offer; Secure - Automatic XSS protection compared to the Server-Side language which is used and URL-free installation that enhances website [6]; codebase-sub-feature.

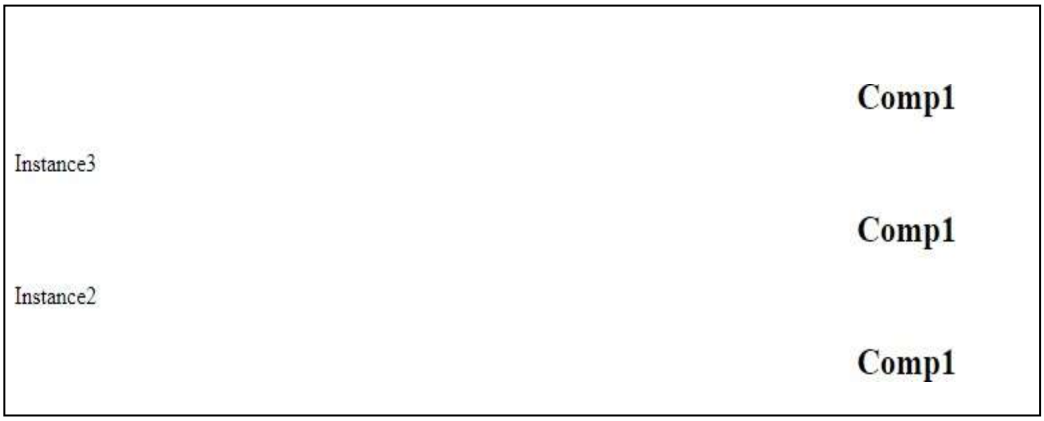
HTL contains things that must be known to developer by including the frontend and the back end such as statements like (usage, tests, resources, including) and language, property objects (properties, page Properties, Current Page.

The snippet of codebase that follows uses global objects produced by Sightly to access some properties.



```

<data-sly-include="/libs/foundation/global.jsp">
       <h2> Current Page </h2>
           Title: ${currentPage.title} <br/>
           Name: ${currentPage.name} <br/>
           Path : ${currentPage.path} <br/>
           Depth :${currentPage.depth} <br/>
        <h2> Current Node </h2>
           Name: ${currentNode.name} <br/>
           Path : ${currentNode.path} <br/>
           Depth :${currentNode.depth} <br/>

```

Fig. 2.5. Sightly Codebase



Comp1

Instance3

Comp1

Instance2

Comp1

Fig. 2.6 Sightly Objects

2.5. JAVASCRIPT(JS)

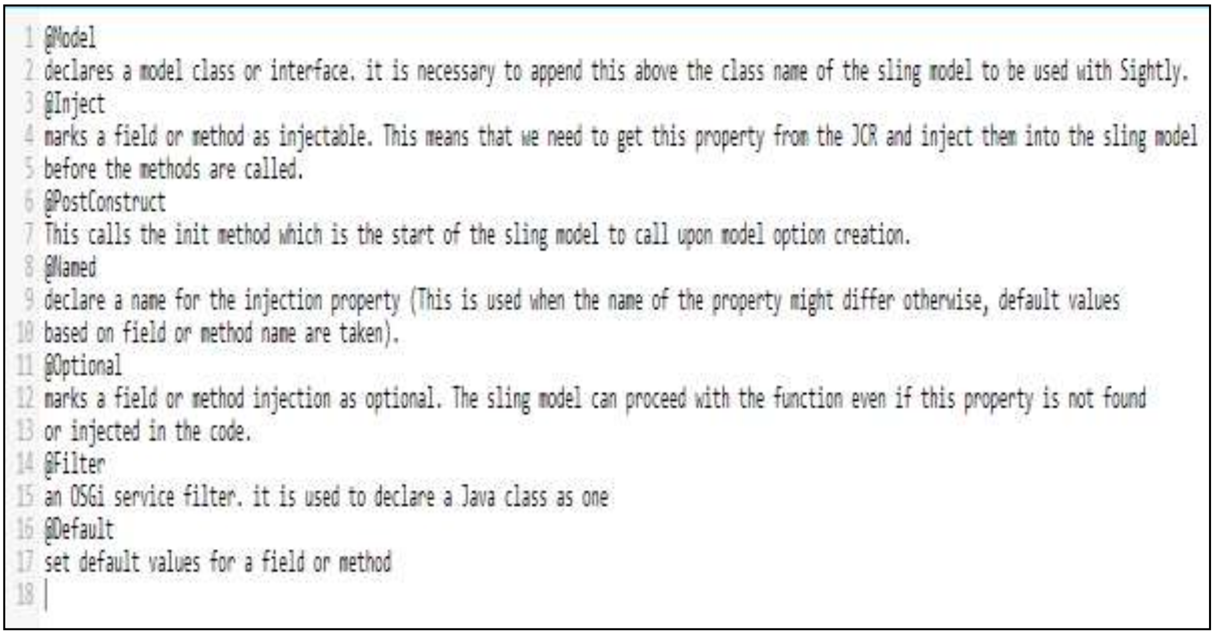
It is a simple, translated language of programming used in AEM to handle writing scripts for consumer side(Css). JS is easy to use because of it's integration with html and is used for a variety of operations. Itis open source and also used as a cross-platform. JS can be executed using JS statements embedded in <script> ... </script>.

In AEM, all JS codebase is put into ClientLibs clusters. ClientLibrary functionality manage all JS and Css resources in the app. and project. It requires management, minimizing the content before sending it to the network to ease the burden. We have ClientLibs folder in applications where all JS files are installed and used.There will be a JS.txt and css.txt file that contains the names of files to use. clientlibs folder has properties called categories that uniquely identify clientlibs i.e. can be a unique identifier in a folder. clientlibs is used in the component that contains the usage statement and the driver statement to drive css or JS or all files of thatentlentlib. ClientLibs are also embedded and rely on facilities that will list all the club's commitments and all other boards that need to be embedded before using them. Depending on something you eat but embedding is not the best in the case of klentlibs i.e. the position of the confident individuals will be loaded but not in the case when the asset is embedded. The ClientLibs library folder is the cq-type repository: ClientLibraryFolder, stored anywhere within / applications, / Libs and / etc (can be configured in the AEM configuration manager); Class Properties is a valuable asset. There is a list of other client libraries that you depend on. For example, given two cqs: ClientLibraryFolder node a and b, if the JS file in 'a' requires other file in ClientLibs B to work or upload content, then at least one of the b class components should are included in A's dependency; embedding: It is used to embed codebase from other client libs. If node a embeds nodes b and c, the resulting Html will be a collection of a content from locations b and c.

2.6. JAVA (SLING MODELS)

Sling models are classes of java like POJO (Plain Old Java Object) is connected to Sightly containing multiple objects which are implicit and featured to perform a certain task on the component that are rendered in Html.

There are annotation that are given by the sling-model like as inject, sling object and AEM object etc. that have an access to object obtained by APIs. Sling models are called as in the slightly codebase by the use of command. Few APIs that are used are Page, Resource, PageManager, Node, Navigation etc. We can change the property of the component using Sling model as entire logic lies in .



```
@Model
declares a model class or interface. it is necessary to append this above the class name of the sling model to be used with Sightly.
@Inject
marks a field or method as injectable. This means that we need to get this property from the JCR and inject them into the sling model
before the methods are called.
@PostConstruct
This calls the init method which is the start of the sling model to call upon model option creation.
@Named
declare a name for the injection property (This is used when the name of the property might differ otherwise, default values
based on field or method name are taken).
@Optional
marks a field or method injection as optional. The sling model can proceed with the function even if this property is not found
or injected in the code.
@Filter
an OSGi service filter. it is used to declare a Java class as one
@Default
set default values for a field or method
```

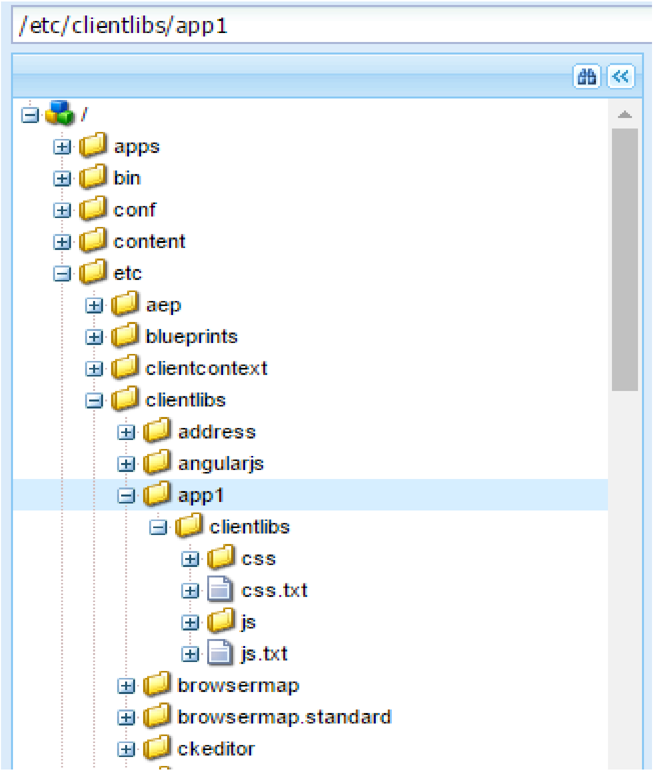
Fig. 2.7. Sling Model Annotations.

Java logic can be used into forms like that Sling models. They can be like POJO (Plain Old Java Object) classes (models),OSGi services,servlets,Sling Services,Workflow classes, constant maintaining classes,APIs,Utility classes etc.

2.7. CLIENTLIB IN AEM

Websites depend on consumer process handling by JS codebase. AEM provide Client-Side library folders to put JS and css (UI) codebase at one place to make it un-tangible and effective for loading.

ClientLibs in AEM provided by adobe will manage all JS and Css resources in the app. User can change the Clientlibs folder in //apps, //libs, //etc but AEM recommends to change only in //etc folder. The process of making CL is listed below

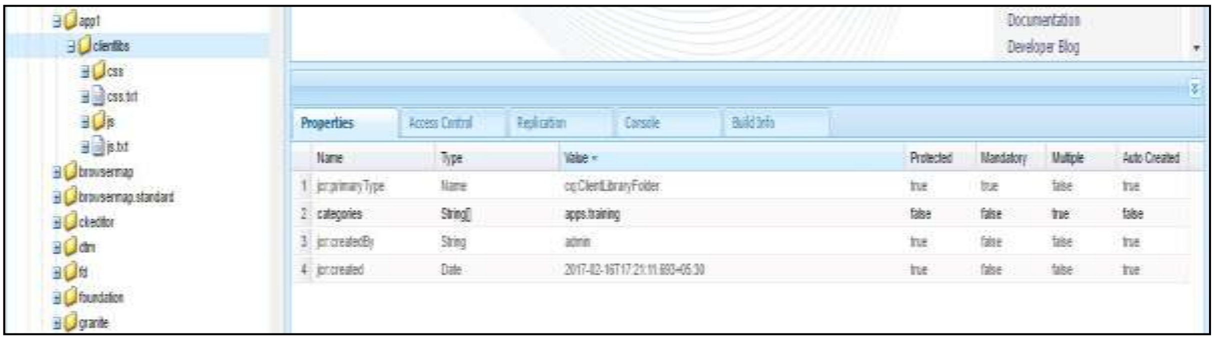


/etc/clientlibs/app1

Fig. 2.8. ClientLib in AEM

- Open Crx
- In etc → ClientLibs make a new folder
- In that new folder create a new node
- Mention the name of the node as any ClientLib, for e.g. ABC and type as ClientLibFolder
- To that clientlib node add category as of type String and value “apps.aem.training”

- Now make a js and css folder. All the css and Js files will be kept here
- Now make js.txt and css.txt in it



	Name	Type	Value	Protected	Mandatory	Multiple	Auto Created
1	jcr:primaryType	Name	cq:ClientLibraryFolder	true	true	false	true
2	categories	String[]	apps.training	false	false	true	false
3	jcr:createdBy	String	admin	true	false	false	true
4	jcr:created	Date	2017-02-16T17:21:11.893+05:30	true	false	false	true

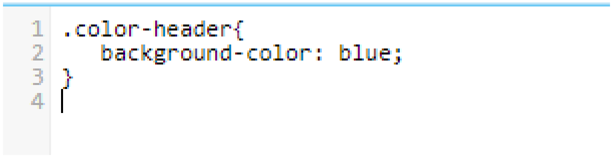
Fig. 2.9. ClientLibs Properties

Add JS and CSS resources

Adding the CSS and JS files in CSS and JS folder.

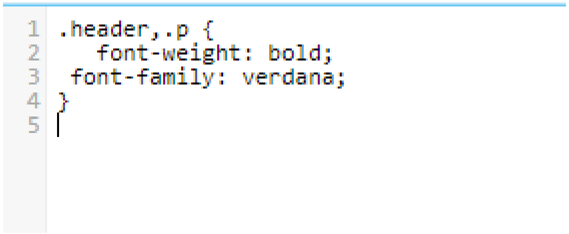
For instance,

header.css



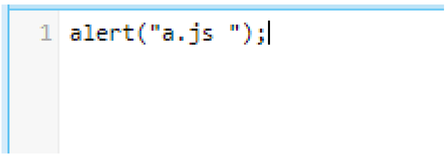
```
.color-header{
   background-color: blue;
}

```

headerfont.css



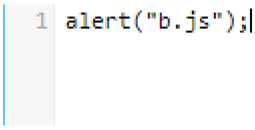
```
.header,.p {
   font-weight: bold;
 font-family: verdana;
}

```

example.JS



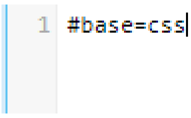
```
alert("a.js ");
```

test.js



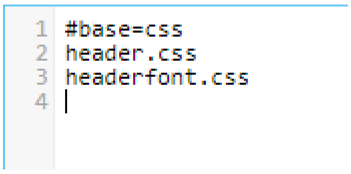
```
alert("b.js");
```

css.txt



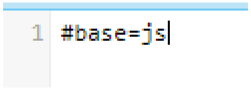
```
#base=css
```

Example:



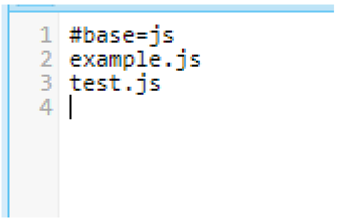
```
#base=css
header.css
headerfont.css

```

JS.txt

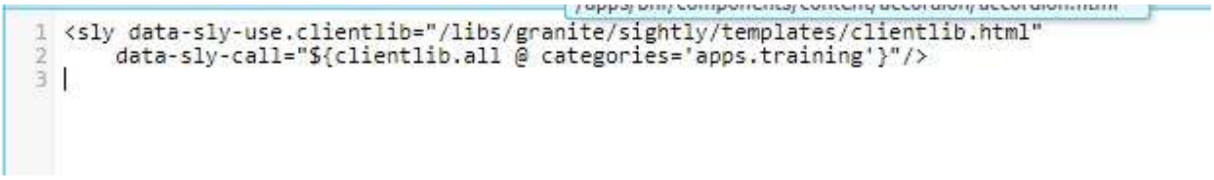


```
#base=js
```

Example:



```
#base=js
example.js
test.js

```



```
<sly data-sly-use.clientlib="/libs/granite/sightly/templates/clientlib.html"
    data-sly-call="${clientlib.all @ categories='apps.training'}"/>
```

This codebase allows addition of ClientLib to the file (sightly).

.

2.8. AEM FORMS

AEM Forms is another great tool provided by Adobe in AEM, that helps us in making and managing forms with great efficiency. This tool helps us in making dynamic and comprehensive forms that are responsive in nature. We can author them in a similar way as we do our AEM websites under our AEM forms and Documents tab of Adobe Experience Manager. These forms can even be divided into fragments where each fragment can be developed individually by different developers concurrently, plus even bigger survey forms can be loaded faster on our AEM Forms using a technique called Lazy Loading. AEM forms can also be used offline by downlading the AEM forms app from playstore and configuring your forms on the App.

They come with many different components like.

- Electronic-Signatures
- Features to attach different files
- Form fragmentation.

Various functionalits that come Out of the Box in AEM Forms are.

- Pre filling data in our forms from xml and json files.
- A panel completely designated to design themes for our Forms.
- Different actions to save submitted data in various file formats.
- Feature to e-mail data to a specific person or a group of people on successful submittion of a form.

The figure below is a demonstration of the basic structure of an AEM Form.

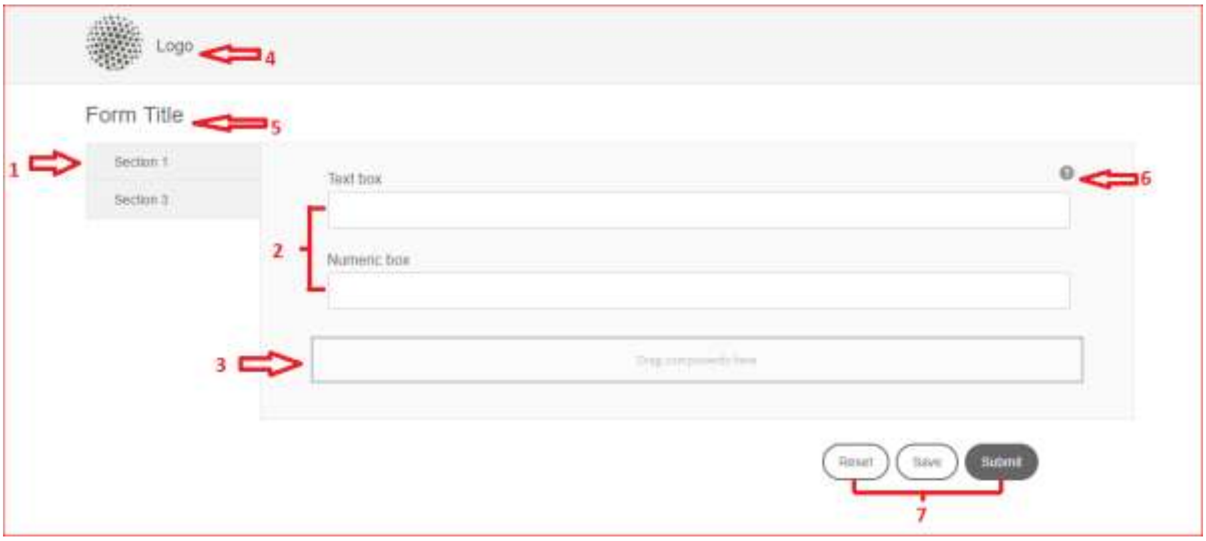


Fig. 2.10. Forms in AEM

1. A form can be disintegrated into different sections and tabs to provide data in a better format..
2. Some OOB field configuration in AEM Forms are place-holder text, field label, name, input type,. They are realy easy to use and help in configuring each field.
3. More fields can be added into the Form by dragging and dropping thme into the Paragraph System of a form.
4. Logo for our forms can be configured by just clicking on it and changing it like a profile picture in our favorite social media app.
5. Similarly all the heading s for our Form can be configured.
6. Description for each of the fields can be added using the help content in the configure tab.
7. We can even modify the front-end using HTML and backend using JavaScript and Java.

The different widgets that are provided by default in AEM Forms are shown in the figure below.

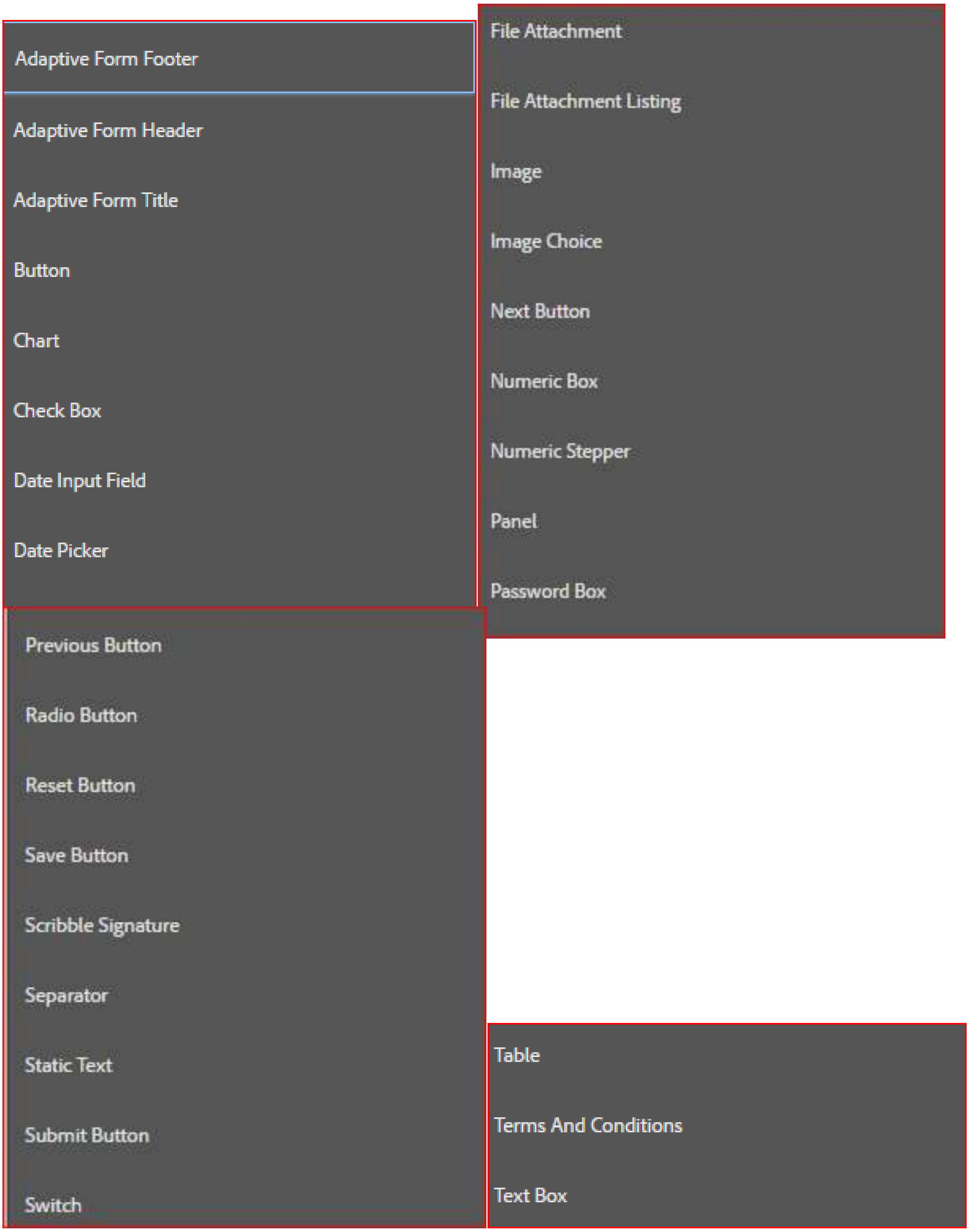


Fig. 2.11 Default Components in Forms

Rule Editor : Rule Editor helps us in places where we want some special conditions to be applied to specific fields in our form.. For example for selecting country codes for different countries we need to apply different type of rules for different country codes Instead of writing the code ourselves we can use AEM Forms prebuilt functionalities. For creating a rule for a specific field select a field then select the rule editor icon as shown in the figure below

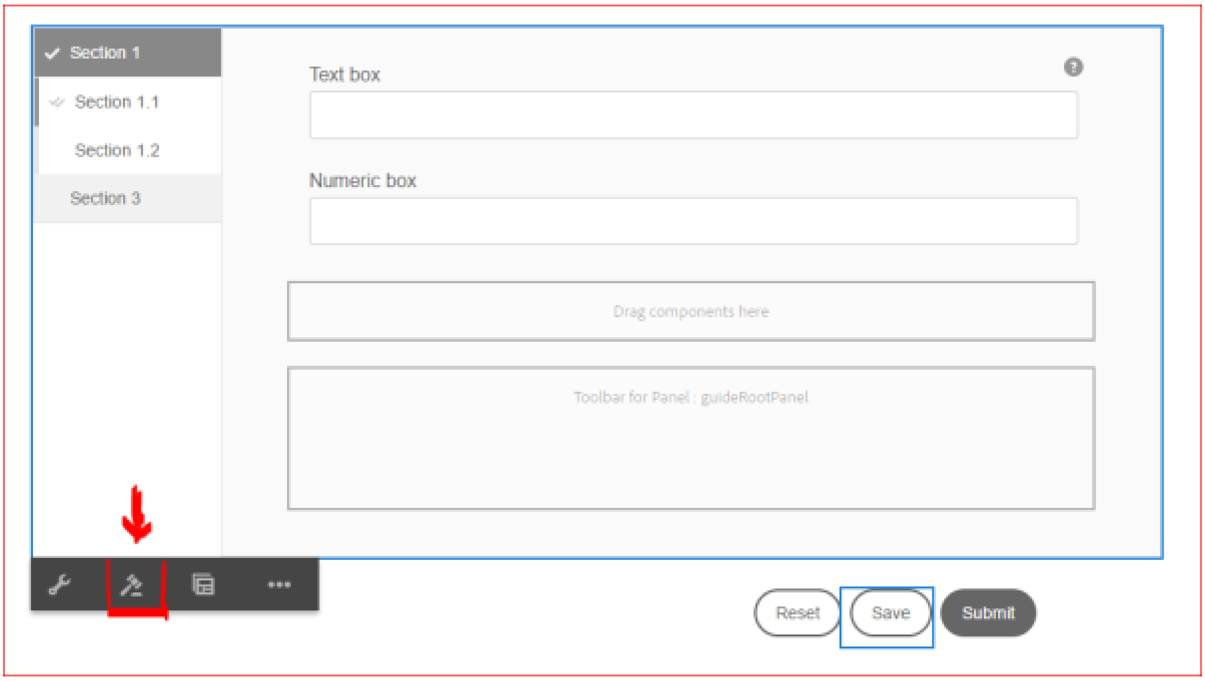


Fig. 2.12 Form Rule Editor

- Select the section from sidekick in the left

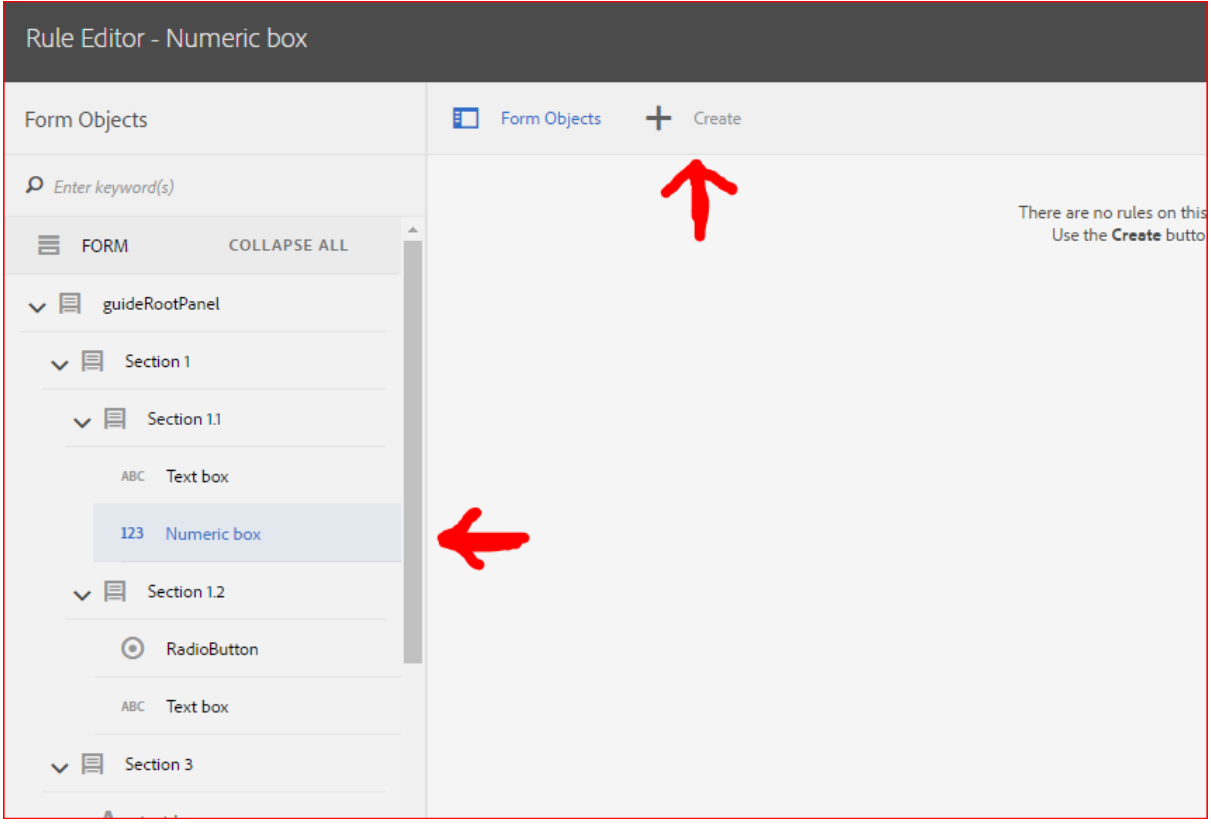


Fig 2.13 Form Rule Editor(b)

- Click on the create icon as demonstrated above
- We can choose from the various forms of operations from the dropdown

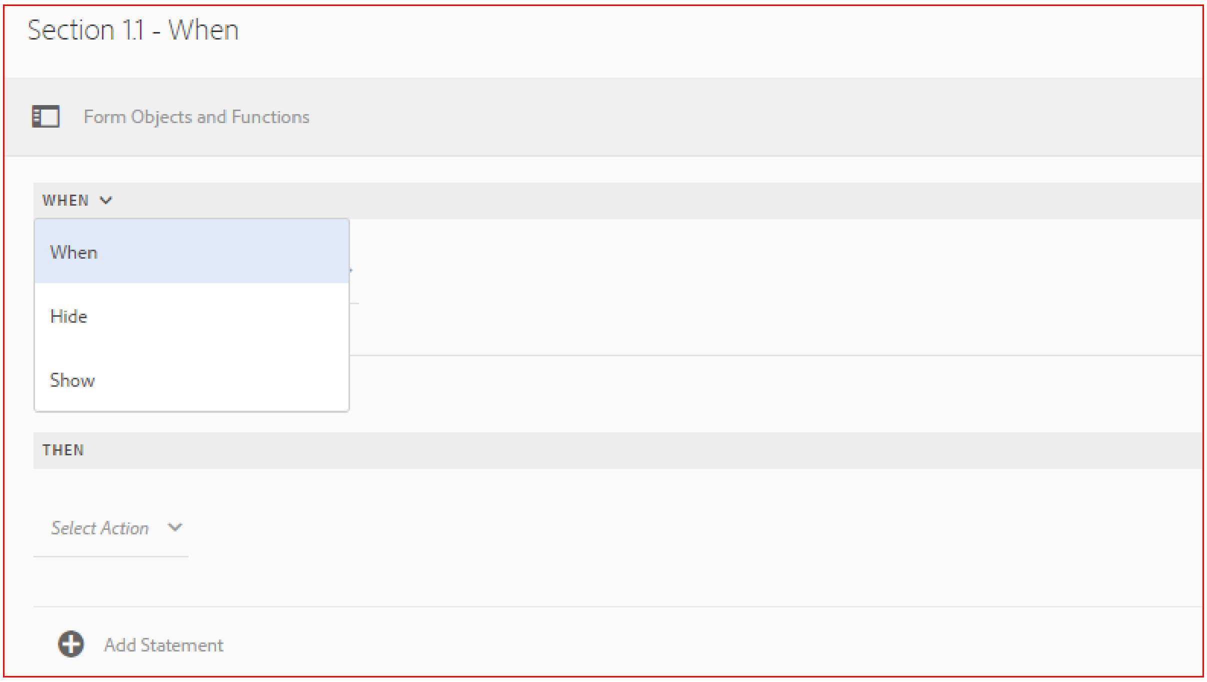
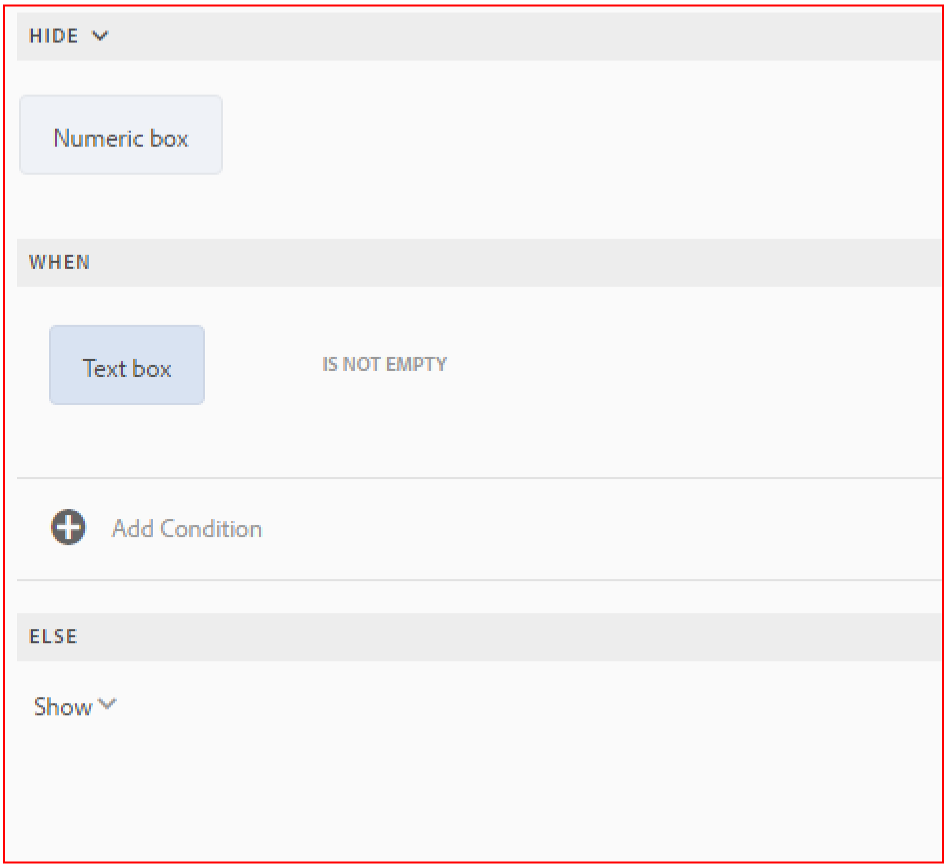


Fig 2.14. Rules

- Select any operation that you want.



HIDE

Numeric box

WHEN

Text box IS NOT EMPTY

Add Condition

ELSE

Show

Fig. 2.15. Rules (b)

An adaptive form can be considered as a generalized fragment like basic details of a person like name ,age, gender, email and contact info etc. It is the duty of a AEM Forms Expert to develop such segments that can be standalone or resuable. Such reusable components in a form can be created using adaptive form functionality of AEM Forms. The steps to create an adaptive form are as follows.

- Choose create an adaptive-form from AEM Forms create button.

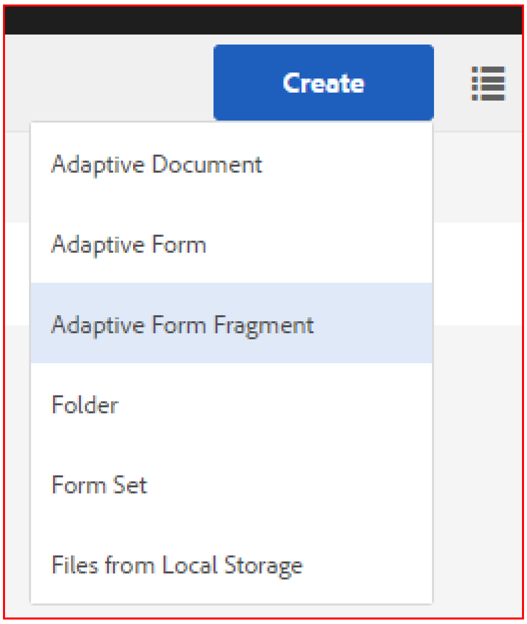


Fig. 2.16. Adaptive Forms in AEM

- Add the name and a short description. of the adaptive form.
- An empty form with a paragraph-system would be created.

Even when we are developing our forms , we can see how they would look and feel at different screen sizes by selecting various breakpoints. It can be done by selecting the rightmost logo on top as shown in the figure below.

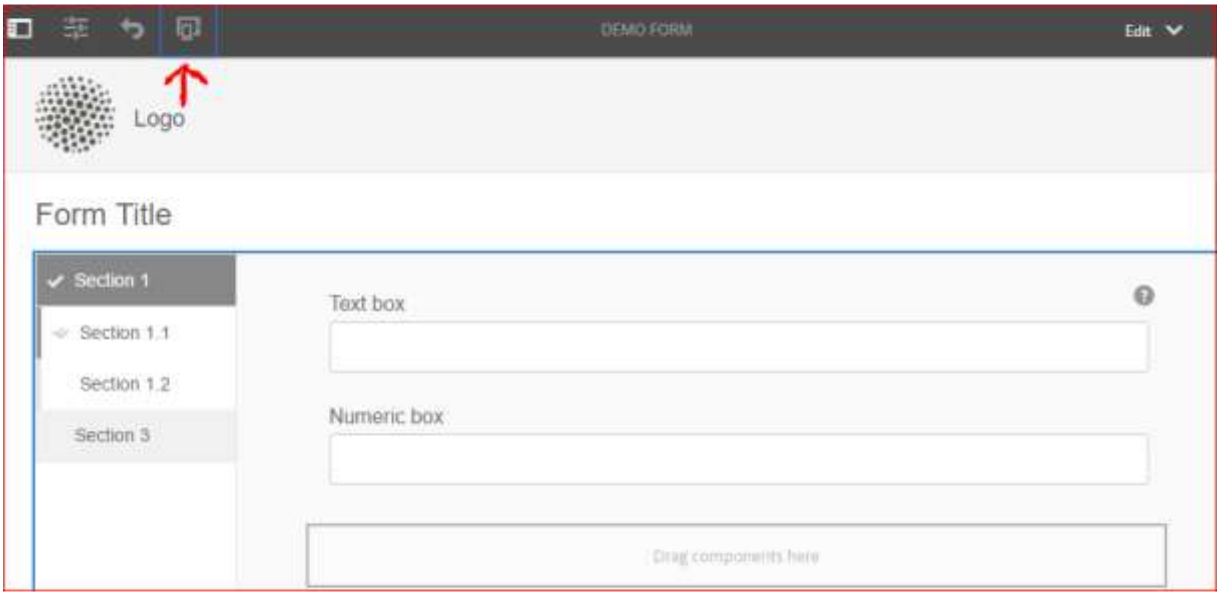


Fig. 2.17. Breakpoints for devices

- We get options to select different kinds of devices and view them in both portrait and landscape mode.

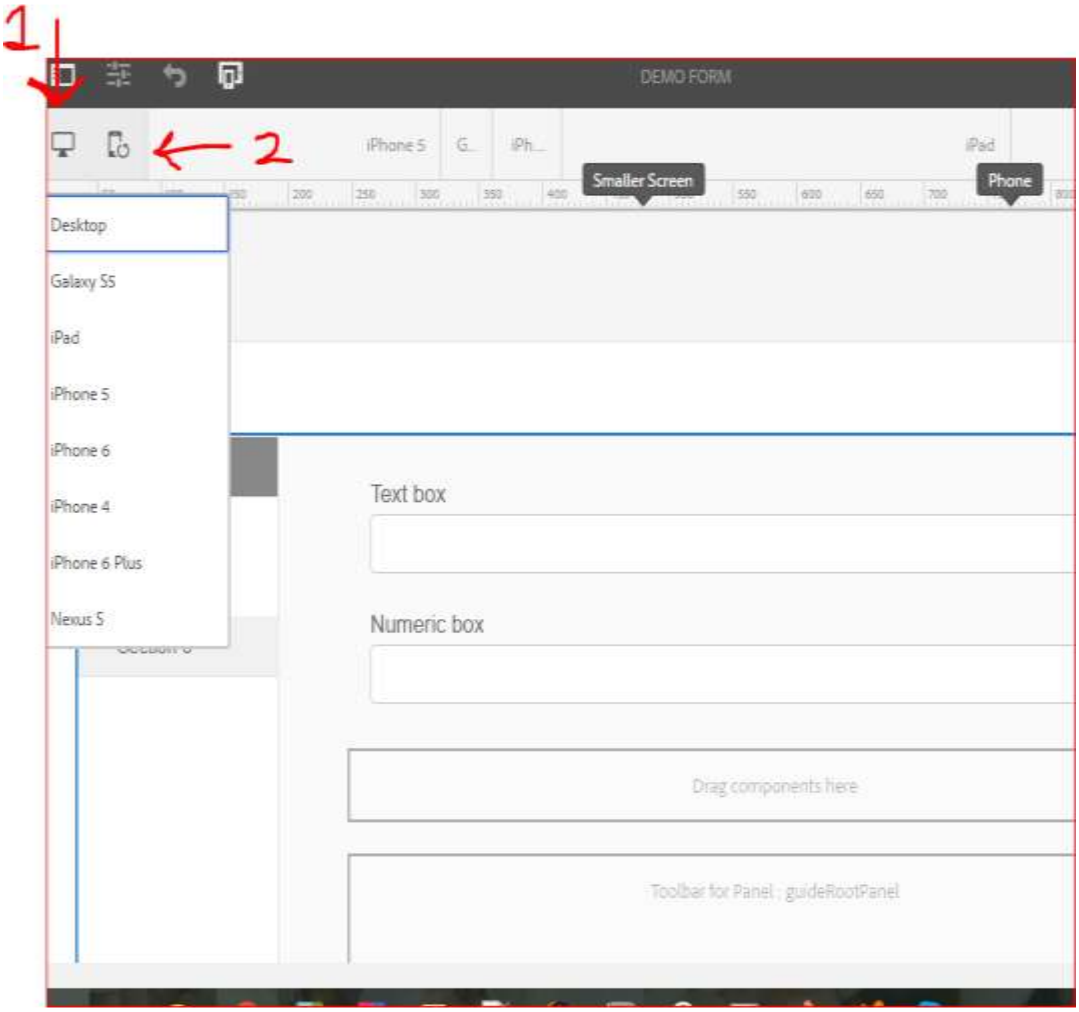


Fig 2.18. Different device screens

2.9. AEM LOGS

One of the soughed feature in AEM is troubleshooting and AEM-logs helped in troubleshooting them bygiving detail about the functions of AEM. AEM-logs are present in CRX-quickstart>AEM-Logs path in the system-file.

1. **REQUEST** – Request contains responses and requests for instance of AEM.

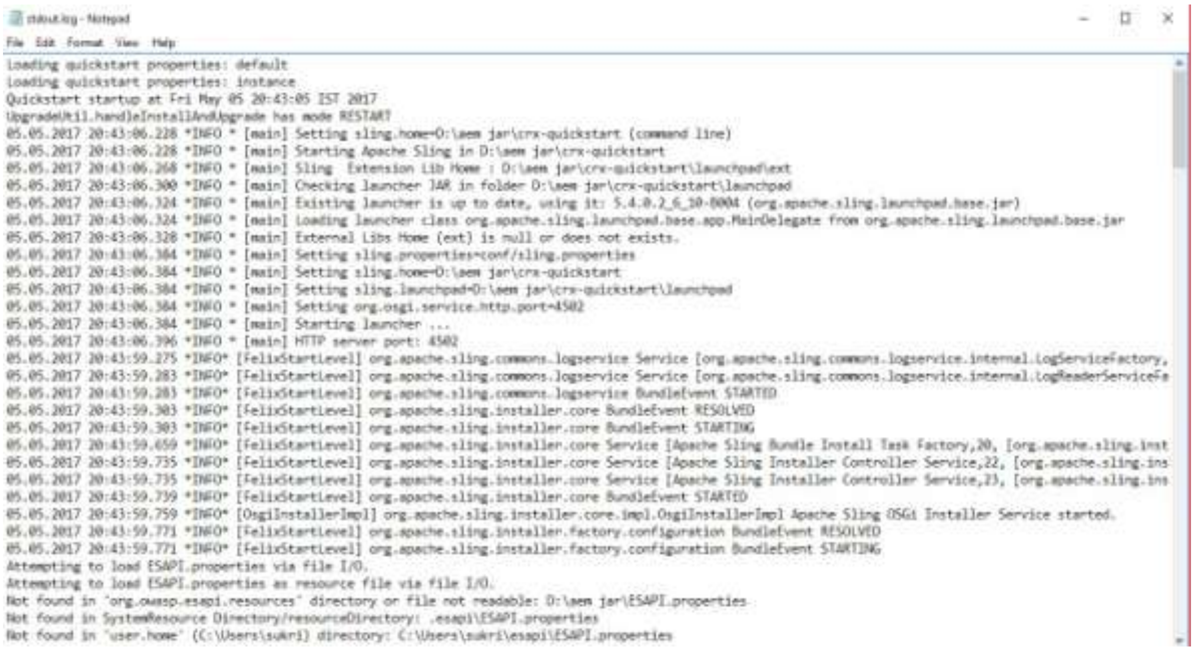
2. **ACCESS** – Access gives the details of the resource which is accessing the instance along with its time.

3. **STDOUT** – Stdout stores all the logger messages.

4. **STDERR** – Stderr file contains detailed error messages.

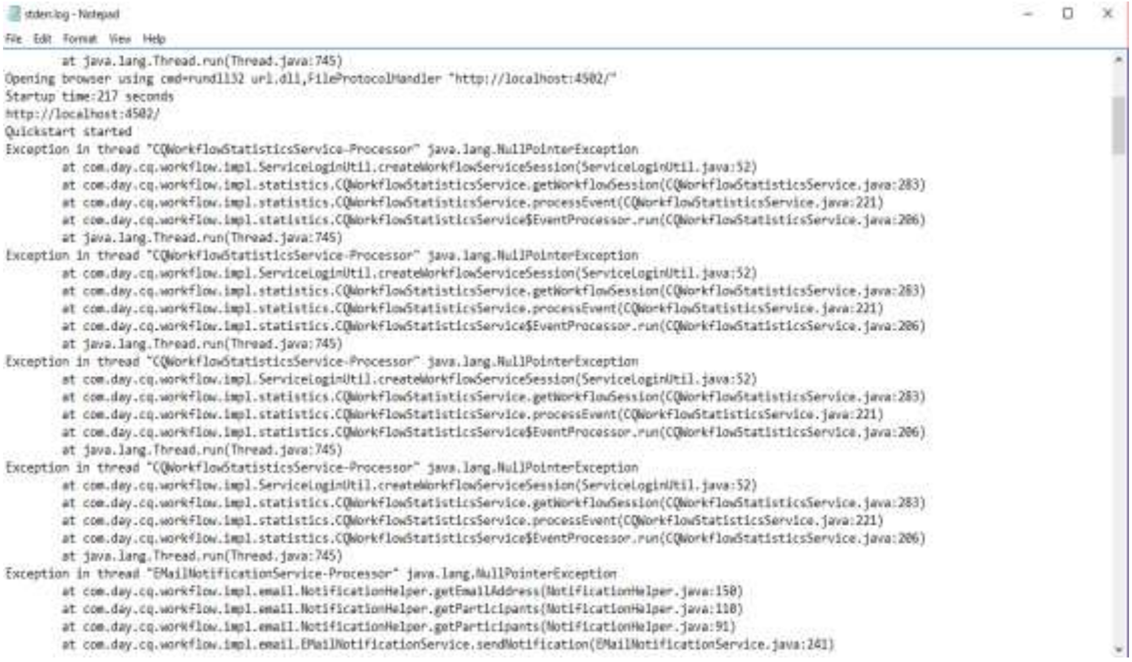
5. **UPGRADE** – Upgrade is the default log that contains the information of the upgrade operation being performed.

6. **ERROR** – error log contains error, this log can be accessed using the command tail -f error.log in command prompt.



```
Loading quickstart properties: default
Loading quickstart properties: instance
Quickstart startup at Fri May 05 20:43:05 IST 2017
UpgradeUtil.handleInstallAndUpgrade has mode RESTART
05.05.2017 20:43:06.228 *INFO * [main] Setting sling.home=D:\aem jar\crx-quickstart (command line)
05.05.2017 20:43:06.228 *INFO * [main] Starting Apache Sling in D:\aem jar\crx-quickstart
05.05.2017 20:43:06.268 *INFO * [main] Sling  Extension Lib Home : D:\aem jar\crx-quickstart\launchpad\ext
05.05.2017 20:43:06.300 *INFO * [main] Checking launcher JAR in folder D:\aem jar\crx-quickstart\launchpad
05.05.2017 20:43:06.324 *INFO * [main] Existing launcher is up to date, using it: 5.4.0.2_6_10-B004 (org.apache.sling.launchpad.base.jar)
05.05.2017 20:43:06.324 *INFO * [main] Loading launcher class org.apache.sling.launchpad.base.app.MainDelegate from org.apache.sling.launchpad.base.jar
05.05.2017 20:43:06.328 *INFO * [main] External Libs Home (ext) is null or does not exists.
05.05.2017 20:43:06.384 *INFO * [main] Setting sling.properties=conf/sling.properties
05.05.2017 20:43:06.384 *INFO * [main] Setting sling.home=D:\aem jar\crx-quickstart
05.05.2017 20:43:06.384 *INFO * [main] Setting sling.launchpad=D:\aem jar\crx-quickstart\launchpad
05.05.2017 20:43:06.384 *INFO * [main] Setting org.osgi.service.http.port=4502
05.05.2017 20:43:06.384 *INFO * [main] Starting launcher ...
05.05.2017 20:43:06.396 *INFO * [main] HTTP server port: 4502
05.05.2017 20:43:59.275 *INFO* [FelixStartLevel] org.apache.sling.commons.logservice Service [org.apache.sling.commons.logservice.internal.LogServiceFactory,
05.05.2017 20:43:59.283 *INFO* [FelixStartLevel] org.apache.sling.commons.logservice Service [org.apache.sling.commons.logservice.internal.LogReaderServiceFa
05.05.2017 20:43:59.283 *INFO* [FelixStartLevel] org.apache.sling.commons.logservice BundleEvent STARTED
05.05.2017 20:43:59.303 *INFO* [FelixStartLevel] org.apache.sling.installer.core BundleEvent RESOLVED
05.05.2017 20:43:59.303 *INFO* [FelixStartLevel] org.apache.sling.installer.core BundleEvent STARTING
05.05.2017 20:43:59.659 *INFO* [FelixStartLevel] org.apache.sling.installer.core Service [Apache Sling Bundle Install Task Factory,20, [org.apache.sling.inst
05.05.2017 20:43:59.735 *INFO* [FelixStartLevel] org.apache.sling.installer.core Service [Apache Sling Installer Controller Service,22, [org.apache.sling.ins
05.05.2017 20:43:59.735 *INFO* [FelixStartLevel] org.apache.sling.installer.core Service [Apache Sling Installer Controller Service,23, [org.apache.sling.ins
05.05.2017 20:43:59.739 *INFO* [FelixStartLevel] org.apache.sling.installer.core BundleEvent STARTED
05.05.2017 20:43:59.759 *INFO* [OsgiInstallerImpl] org.apache.sling.installer.core.impl.OsgiInstallerImpl Apache Sling OSGi Installer Service started.
05.05.2017 20:43:59.771 *INFO* [FelixStartLevel] org.apache.sling.installer.factory.configuration BundleEvent RESOLVED
05.05.2017 20:43:59.771 *INFO* [FelixStartLevel] org.apache.sling.installer.factory.configuration BundleEvent STARTING
Attempting to load ESAPI.properties via file I/O.
Attempting to load ESAPI.properties as resource file via file I/O.
Not found in 'org.owasp.esapi.resources' directory or file not readable: D:\aem jar\ESAPI.properties
Not found in SystemResource Directory/resourceDirectory: .esapi\ESAPI.properties
Not found in 'user.home' (C:\Users\sukri) directory: C:\Users\sukri\esapi\ESAPI.properties
```

Fig. 2.19 Stdout.log(File)



```
        at java.lang.Thread.run(Thread.java:745)
Opening browser using cmd=rundll32 url.dll,FileProtocolHandler "http://localhost:4502/"
Startup time:217 seconds
http://localhost:4502/
Quickstart started
Exception in thread "CQWorkflowStatisticsService-Processor" java.lang.NullPointerException
        at com.day.cq.workflow.impl.ServiceLoginUtil.createWorkflowServiceSession(ServiceLoginUtil.java:52)
        at com.day.cq.workflow.impl.statistics.CQWorkflowStatisticsService.getWorkflowSession(CQWorkflowStatisticsService.java:283)
        at com.day.cq.workflow.impl.statistics.CQWorkflowStatisticsService.processEvent(CQWorkflowStatisticsService.java:221)
        at com.day.cq.workflow.impl.statistics.CQWorkflowStatisticsService$EventProcessor.run(CQWorkflowStatisticsService.java:206)
        at java.lang.Thread.run(Thread.java:745)
Exception in thread "CQWorkflowStatisticsService-Processor" java.lang.NullPointerException
        at com.day.cq.workflow.impl.ServiceLoginUtil.createWorkflowServiceSession(ServiceLoginUtil.java:52)
        at com.day.cq.workflow.impl.statistics.CQWorkflowStatisticsService.getWorkflowSession(CQWorkflowStatisticsService.java:283)
        at com.day.cq.workflow.impl.statistics.CQWorkflowStatisticsService.processEvent(CQWorkflowStatisticsService.java:221)
        at com.day.cq.workflow.impl.statistics.CQWorkflowStatisticsService$EventProcessor.run(CQWorkflowStatisticsService.java:206)
        at java.lang.Thread.run(Thread.java:745)
Exception in thread "CQWorkflowStatisticsService-Processor" java.lang.NullPointerException
        at com.day.cq.workflow.impl.ServiceLoginUtil.createWorkflowServiceSession(ServiceLoginUtil.java:52)
        at com.day.cq.workflow.impl.statistics.CQWorkflowStatisticsService.getWorkflowSession(CQWorkflowStatisticsService.java:283)
        at com.day.cq.workflow.impl.statistics.CQWorkflowStatisticsService.processEvent(CQWorkflowStatisticsService.java:221)
        at com.day.cq.workflow.impl.statistics.CQWorkflowStatisticsService$EventProcessor.run(CQWorkflowStatisticsService.java:206)
        at java.lang.Thread.run(Thread.java:745)
Exception in thread "CQWorkflowStatisticsService-Processor" java.lang.NullPointerException
        at com.day.cq.workflow.impl.ServiceLoginUtil.createWorkflowServiceSession(ServiceLoginUtil.java:52)
        at com.day.cq.workflow.impl.statistics.CQWorkflowStatisticsService.getWorkflowSession(CQWorkflowStatisticsService.java:283)
        at com.day.cq.workflow.impl.statistics.CQWorkflowStatisticsService.processEvent(CQWorkflowStatisticsService.java:221)
        at com.day.cq.workflow.impl.statistics.CQWorkflowStatisticsService$EventProcessor.run(CQWorkflowStatisticsService.java:206)
        at java.lang.Thread.run(Thread.java:745)
Exception in thread "EMailNotificationService-Processor" java.lang.NullPointerException
        at com.day.cq.workflow.impl.email.NotificationHelper.getEmailAddress(NotificationHelper.java:150)
        at com.day.cq.workflow.impl.email.NotificationHelper.getParticipants(NotificationHelper.java:110)
        at com.day.cq.workflow.impl.email.NotificationHelper.getParticipants(NotificationHelper.java:91)
        at com.day.cq.workflow.impl.email.EMailNotificationService.sendNotification(EMailNotificationService.java:241)
```

Fig. 2.20. Stderr.log(File)

2.10. AEM REPORTS

AEM gives a functions to give the access of reports that are default that can be configured by the user.
Component, health check, disk usage, Workflow instance, workflow, page activity, user report are few examples of AEM-Reports.
localhost:4502/miscadmin#/etc/reports – path to see the report

2.11. AGILE METHODOLOGY

In Software Developmenmt, Agile methodology refers to a practice of development that revolves around iterative development, timely deliveries, adaptation and improvement. Many different variations of Agile methodology are in use. Some of more popular ones are Scrum, Kanban and Extreme Programming(XP). ArgilDX has chosen to follow Scrum as their methodology. All variations of agile follow some common values highlighted in the Agile Manifesto. The values differ from traditional software development methodologies in the following way. Agile values working software over extensive documentation. From the customer's perspective agile values collaboration over negotiation. Agile prefers adapting to changes instead of sticking to plans. In terms of resources, agile values interactions over processes.
In Agile, the product evolves over time. The development of the product is divided into a series of tasks. These tasks include a cycle of planning, developing and testing. These tasks are subject to change and improvisation as and when required. These changes are dictated by the values mentioned in the Agile manifesto as well as changes brought about by changing requirements or tools. This makes these tasks easy and lightweight. This is where Agile get its name from. Agile makes an effort to get the entire team to utilize their tools and bandwidth in the most productive way to help the team in rolling out deliverables as early as possible. This raises the morale of the team and increases the productivity considerably.
Why Agile is preferred over other methodologies:
Agile makes the entire team functional at the same time. Since Agile works in iterations a lot of the risks and drawbacks of the project are avoided since they can be fixed in the next iteration. Shorter delivery times increases the business value of the product. Agile is open to using newer technologies and platforms which can help a team keep up to the times. Agile pays an importance to acceptance of the product by the end user.

The Scrum Process

The Scrum Framework is an agile framework which helps the team in working together effectively to achieve their common goal. Scrum is easy to implement and gives significant increase in productivity and results. In this framework, all the features and bugs are compiled into a list, from which they can be picked on the basis of their priority and be developed at any time in development of the product. Scrum includes frequent team meetings meant to be attended by each and every team member to discuss the status of the project. The agenda of these meetings in not only to discuss and distribute work meant to be done parallely but also to remove hindrances being faced by the team. The features and bugs can have their priority changed at any point in the development, they can either be worked on earlier or later as decided by the team . Scrum features the following principles :

- The entire project is divided into small iterations.
- Prioritization of features in any given iteration.
- Daily Scrum calls to discuss and remove obstacles in the development cycle.
- Regular retrospective meetings to discuss improvements for later iterations.

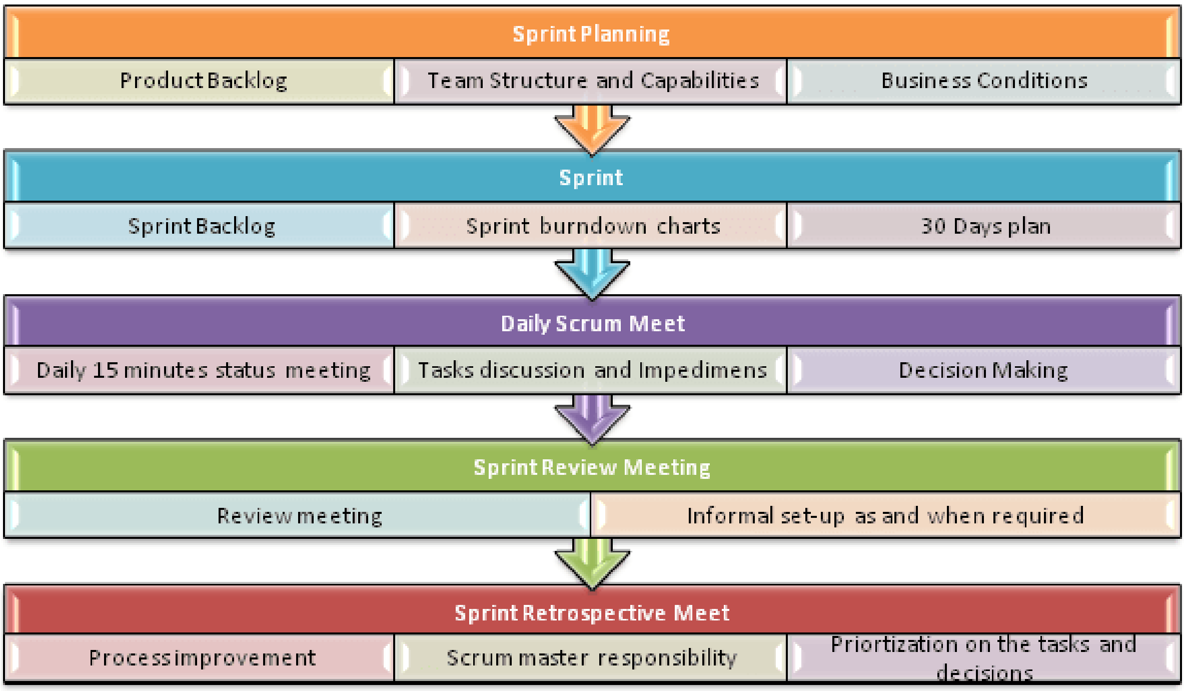

Sprint Planning
Product Backlog
Team Structure and Capabilities
Business Conditions
Sprint
Sprint Backlog
Sprint burndown charts
30 Days plan
Daily Scrum Meet
Daily 15 minutes status meeting
Tasks discussion and Impedimens
Decision Making
Sprint Review Meeting
Review meeting
Informal set-up as and when required
Sprint Retrospective Meet
Process improvement
Scrum master responsibility
Priortization on the tasks and decisions

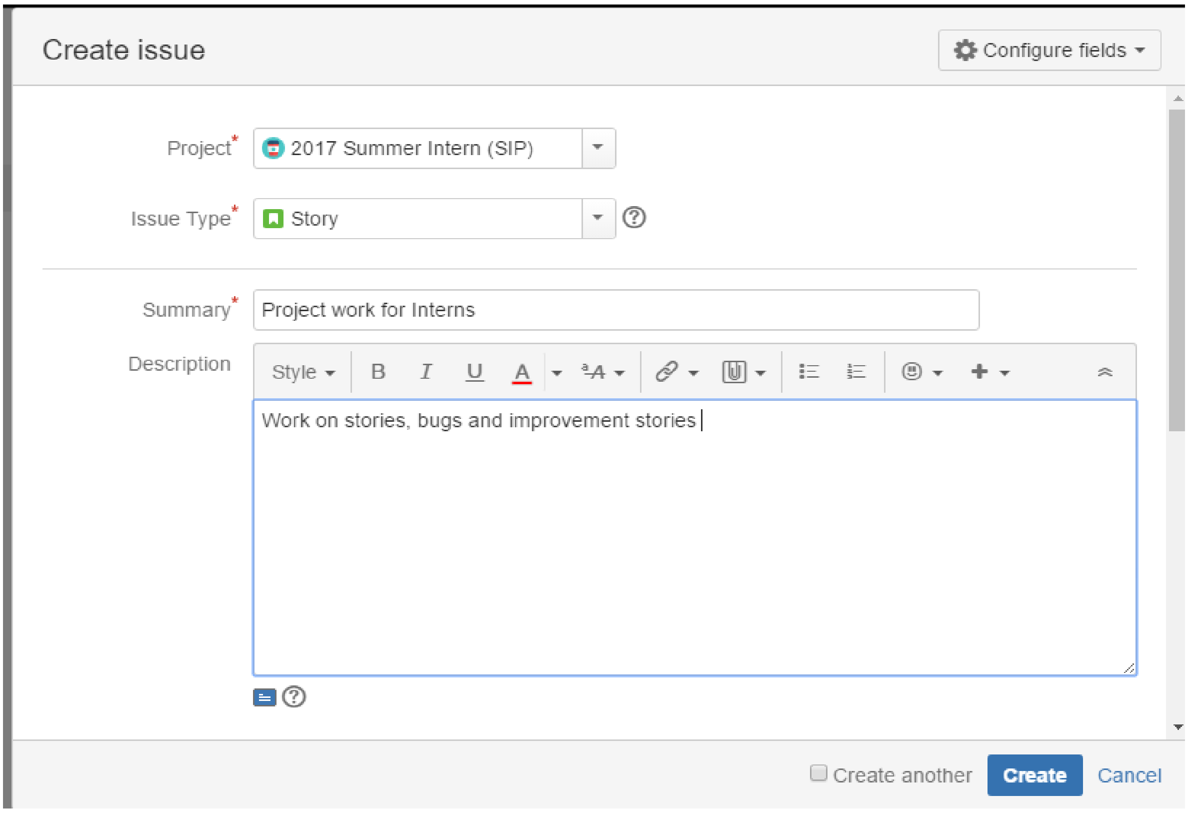
Fig. 2.21 Agile Model

The first step when following Scrum is Sprint planning. In this step, the tasks are compiled into the product backlog, they are prioritized and assigned to team members. Sprint includes scoping of tasks to focus on the end product.

Daily scrum calls are frequent meetings facilitated by the scrum master .In these meetings, the scrum master reviews the work done by each member to help him plan the next sprints in a better way.

At the end of each sprint a Scrum retrospection meeting is held. In this meeting the entire sprint is reviewed in hindsight to help make future decisions. Scrum uses many charts and plots such as the Velocity Chart and the Burndown Chart in the retrospective meeting to make future decisions and also serves in making the client more aware of the work being done by the team.

Keeping track of the project is a complicated task yet it remains to be a really important one. There are many tools that help in managing an enterprise level project. JIRA is one such tool. JIRA is a tool developed by Atlassian which helps in project management and issue tracking. It fully supports Agile development in many ways such as user stories appearing in the dashboard, planning sprints and visualizing the product backlog. JIRA also has full support for Scrum dashboards, namely the Scrum Board. JIRA provides the developer with an effective way to visualize, summarize and prioritize the various tasks at hand with the developer.



Create issue

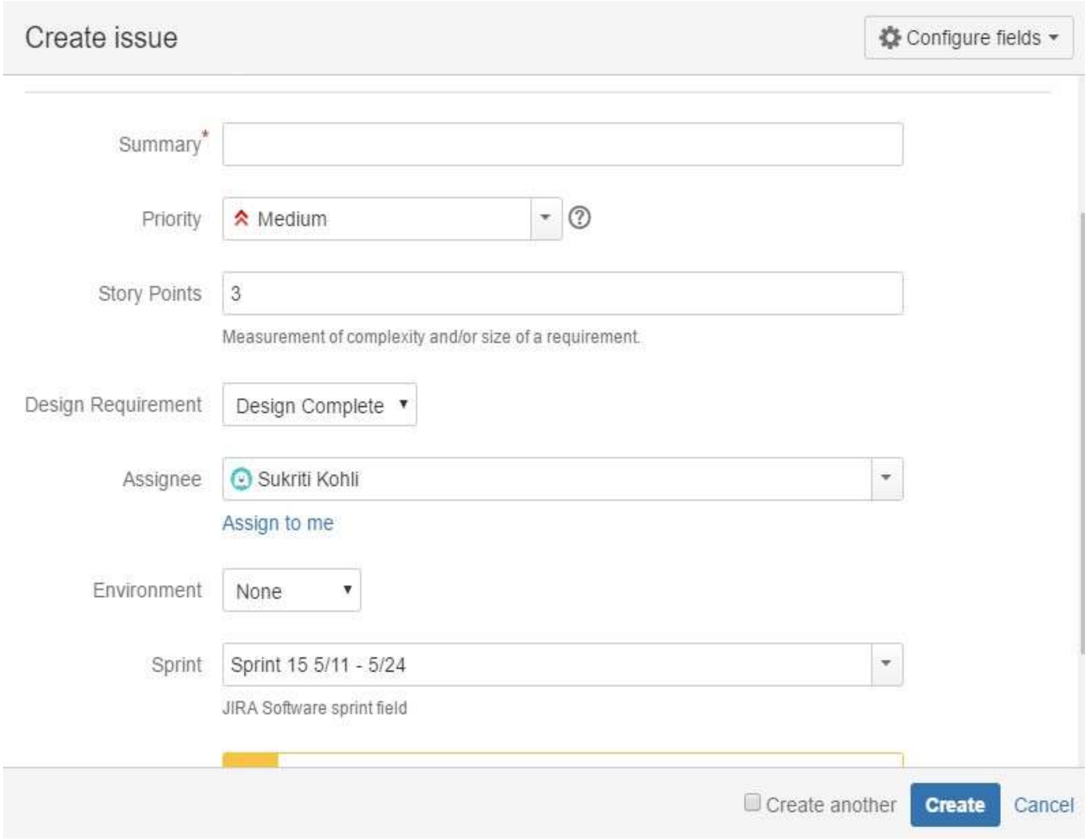
Project*: 2017 Summer Intern (SIP)

Issue Type*: Story

Summary*: Project work for Interns

Description: Work on stories, bugs and improvement stories

Fig. 2.22. JIRA Issue creation.



Create issue

Summary*	
Priority	Medium
Story Points	3 Measurement of complexity and/or size of a requirement.
Design Requirement	Design Complete
Assignee	Sukriti Kohli Assign to me
Environment	None
Sprint	Sprint 15 5/11 - 5/24 JIRA Software sprint field

□ Create another

Fig. 2.23. Bug report in JIRA.

CHAPTER 3

SYSTEM DEVELOPMENT

3.1. AEM BASIC IMPLEMENTATION

The following screen is shown when we start AEM's jar file.

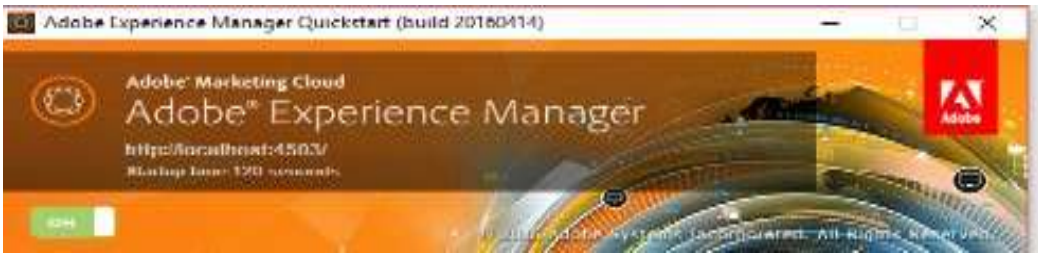

Adobe Experience Manager Quickstart (build 20160414)
Adobe Marketing Cloud
Adobe® Experience Manager
http://localhost:4503/
Startup time: 120 seconds
ON
© 2016 Adobe Systems Incorporated. All Rights Reserved.
Adobe

Fig. 3.1 AEM Start Screen

AEM's Touch UI screen, that allows us to navigate through the various features present in AEM is displayed in the figure below.

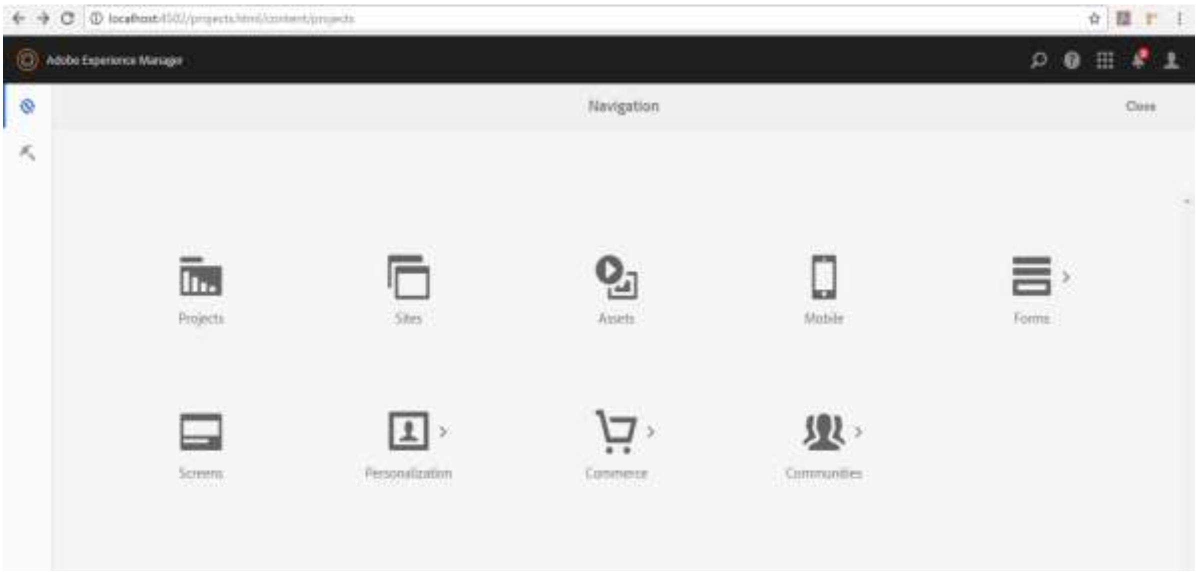


Fig. 3.2 AEM Touch UI

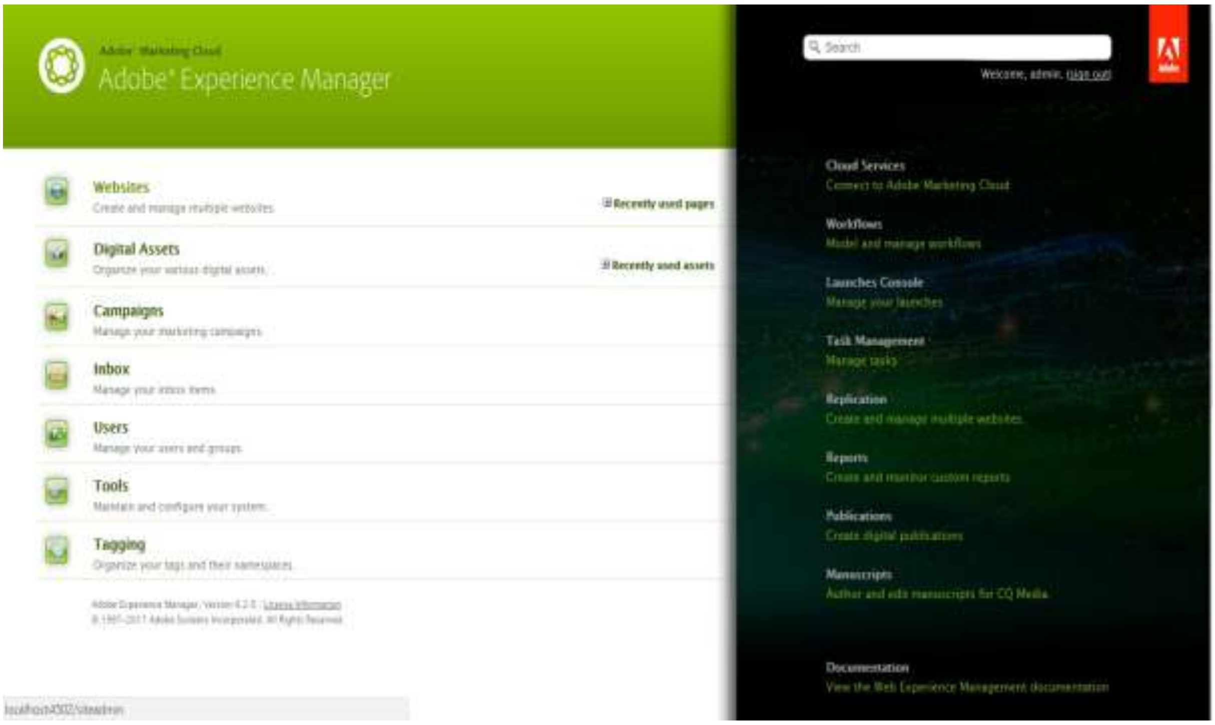

Adobe Marketing Cloud
Adobe Experience Manager
Websites
Create and manage multiple websites.
Recently used pages
Digital Assets
Organize your various digital assets.
Recently used assets
Campaigns
Manage your marketing campaigns.
Inbox
Manage your inbox items.
Users
Manage your users and groups.
Tools
Maintain and configure your system.
Tagging
Organize your tags and their namespaces.
Adobe Experience Manager, Version 6.2.0 | License Information
© 1997–2017 Adobe Systems Incorporated. All Rights Reserved.
localhost:4502/siteadmin
Search
Welcome, admin. (sign out)
Cloud Services
Connect to Adobe Marketing Cloud
Workflows
Model and manage workflows
Launches Console
Manage your launches
Task Management
Manage tasks
Replication
Create and manage multiple websites
Reports
Create and monitor custom reports
Publications
Create digital publications
Manuscripts
Author and edit manuscripts for CQ Media
Documentation
View the Web Experience Management documentation

Fig. 3.3 AEM homepage

The above figure shows us the welcome homepage in Adobe's Experience Manager that gives us access to various functionalities that are present in AEM. It can be used to access the following in AEM:

Siteadmin: It provides us access to the different website and the webpages present in a project

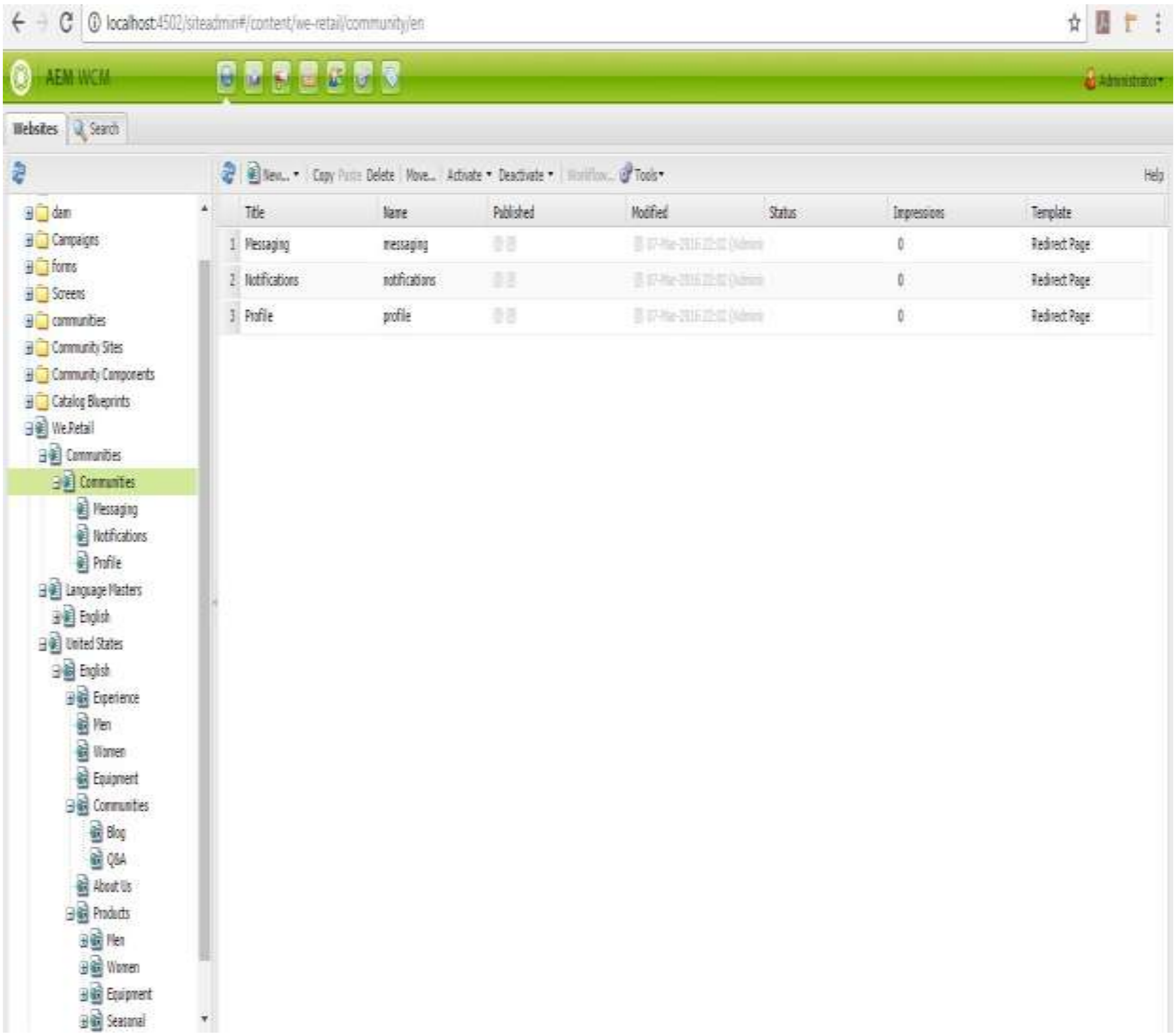
Damadmin: It is a digital assets repository used for storing and managing files, images,videos, etc. which are used in various projects.

Campaigns: It provides us integration with Adobe's Marketing tool. Adobe Campaign.

Inbox: It provides us access to mail inbox of all the users that have logged in..

Useradmin: It gives us access to various profiles of users and their different level of access rights.

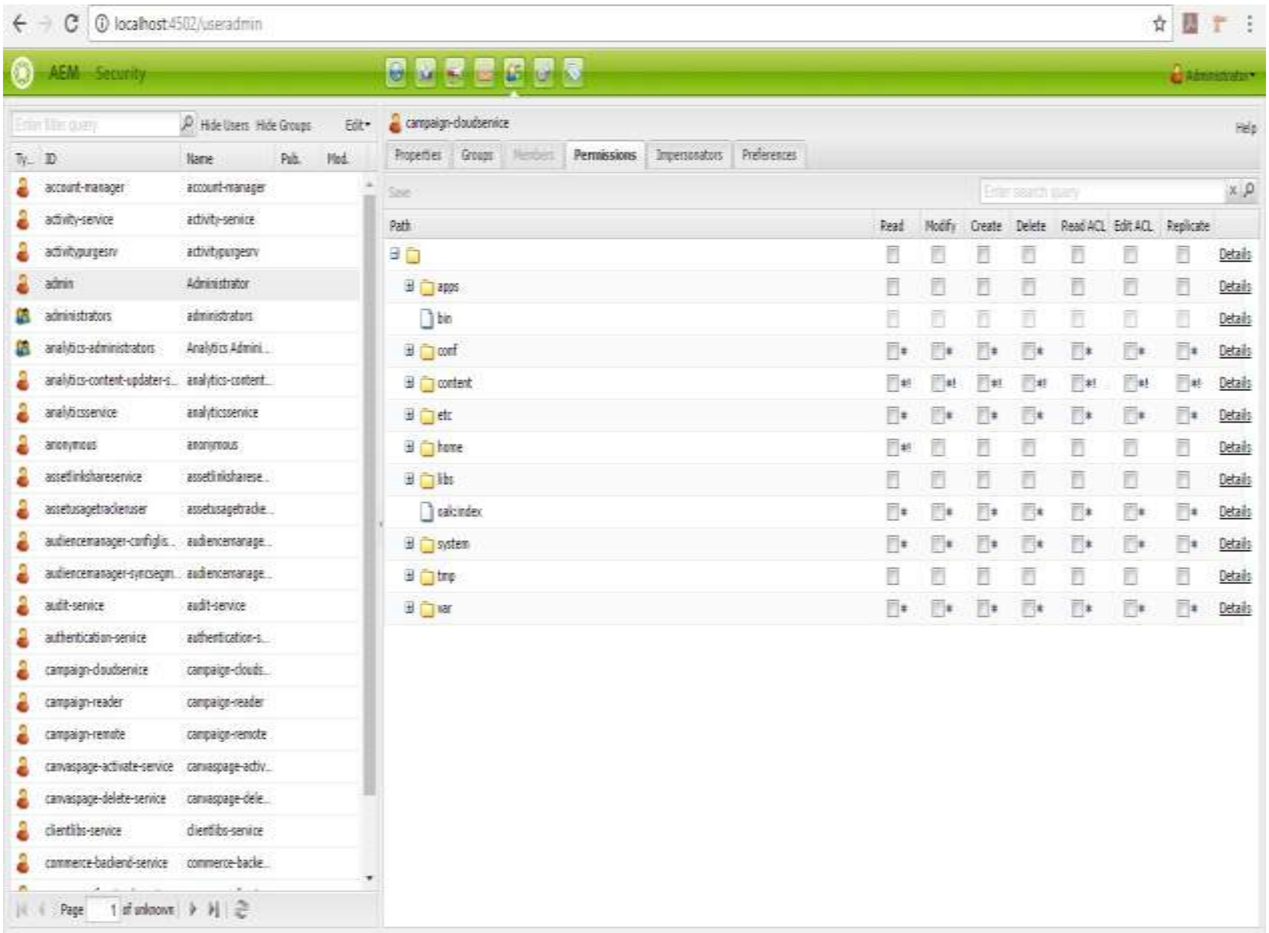
The right side console has different features that include, replication, workflows, many publications of different kinds. Replication is a method in which changes are made to the page's environment from author instance to a different instance called publish instance and the numerous changes are shown in realtime.



	Title	Name	Published	Modified	Status	Impressions	Template
1	Messaging	messaging		07-Mar-2016 22:02 (Admin		0	Redirect Page
2	Notifications	notifications		07-Mar-2016 22:02 (Admin		0	Redirect Page
3	Profile	profile		07-Mar-2016 22:02 (Admin		0	Redirect Page

Fig. 3.4 AEM Site Administrator

We can see a hierarchy of pages for our sample project provided in the above figure



localhost:4502/useradmin

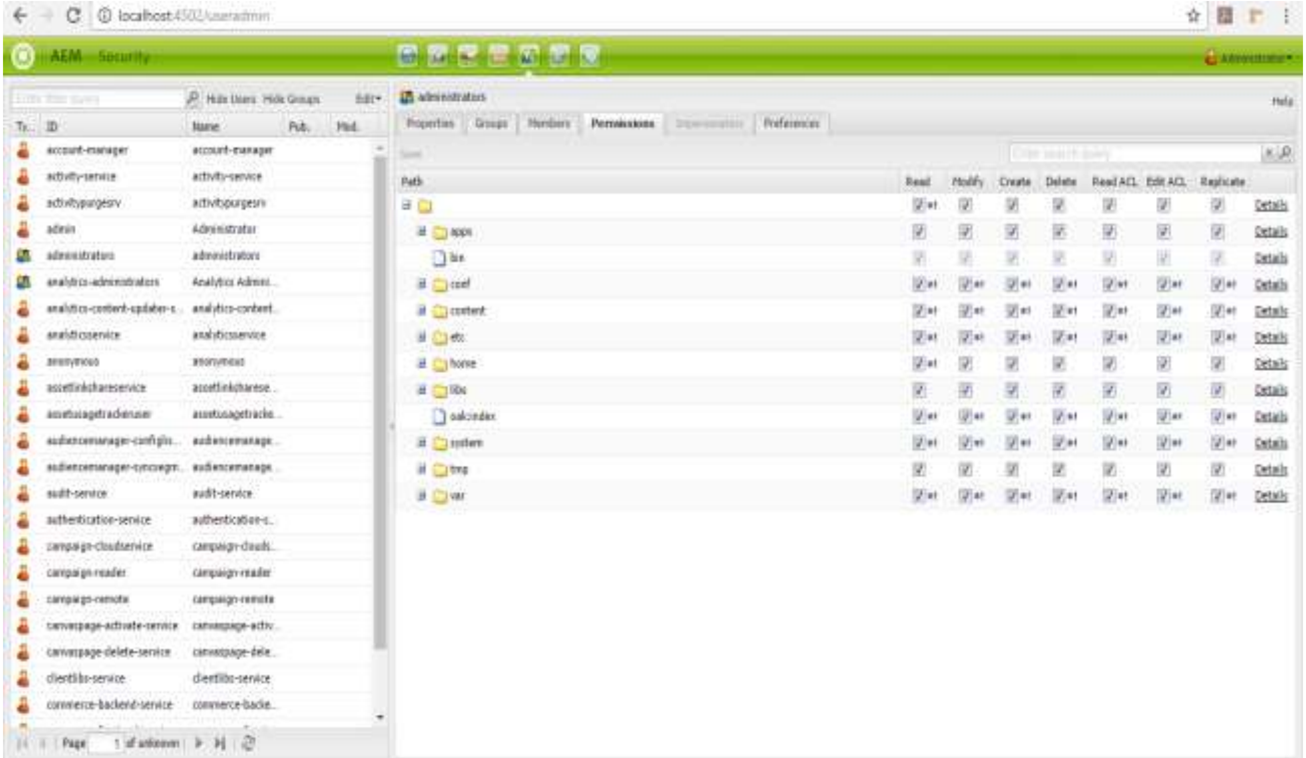
Ty..	ID	Name	Pub.	Mod.
	account-manager	account-manager		
	activity-service	activity-service		
	activitypurgesrv	activitypurgesrv		
	admin	Administrator		
	administrators	administrators		
	analytics-administrators	Analytics Admini...		
	analytics-content-updater-s...	analytics-content...		
	analyticsservice	analyticsservice		
	anonymous	anonymous		
	assetlinkshareservice	assetlinksharese...		
	assetusagetrackeruser	assetusagetracke...		
	audiencemanager-configlis...	audiencemanage...		
	audiencemanager-syncsegm...	audiencemanage...		
	audit-service	audit-service		
	authentication-service	authentication-s...		
	campaign-cloudservice	campaign-clouds...		
	campaign-reader	campaign-reader		
	campaign-remote	campaign-remote		
	canvaspage-activate-service	canvaspage-activ...		
	canvaspage-delete-service	canvaspage-dele...		
	clientlibs-service	clientlibs-service		
	commerce-backend-service	commerce-backe...		

campaign-cloudservice

Path	Read	Modify	Create	Delete	Read ACL	Edit ACL	Replicate	
	□	□	□	□	□	□	□	Details
apps	□	□	□	□	□	□	□	Details
bin	□	□	□	□	□	□	□	Details
conf	□*	□*	□*	□*	□*	□*	□*	Details
content	□*!	□*!	□*!	□*!	□*!	□*!	□*!	Details
etc	□*	□*	□*	□*	□*	□*	□*	Details
home	□*!	□	□	□	□	□	□	Details
libs	□	□	□	□	□	□	□	Details
calcindex	□*	□*	□*	□*	□*	□*	□*	Details
system	□*	□*	□*	□*	□*	□*	□*	Details
tmp	□	□	□	□	□	□	□	Details
var	□*	□*	□*	□*	□*	□*	□*	Details

Fig 3.5 AEM User Admin

The above figure shows us the Useradmin console where we can check the various users and the groups which they belong to.



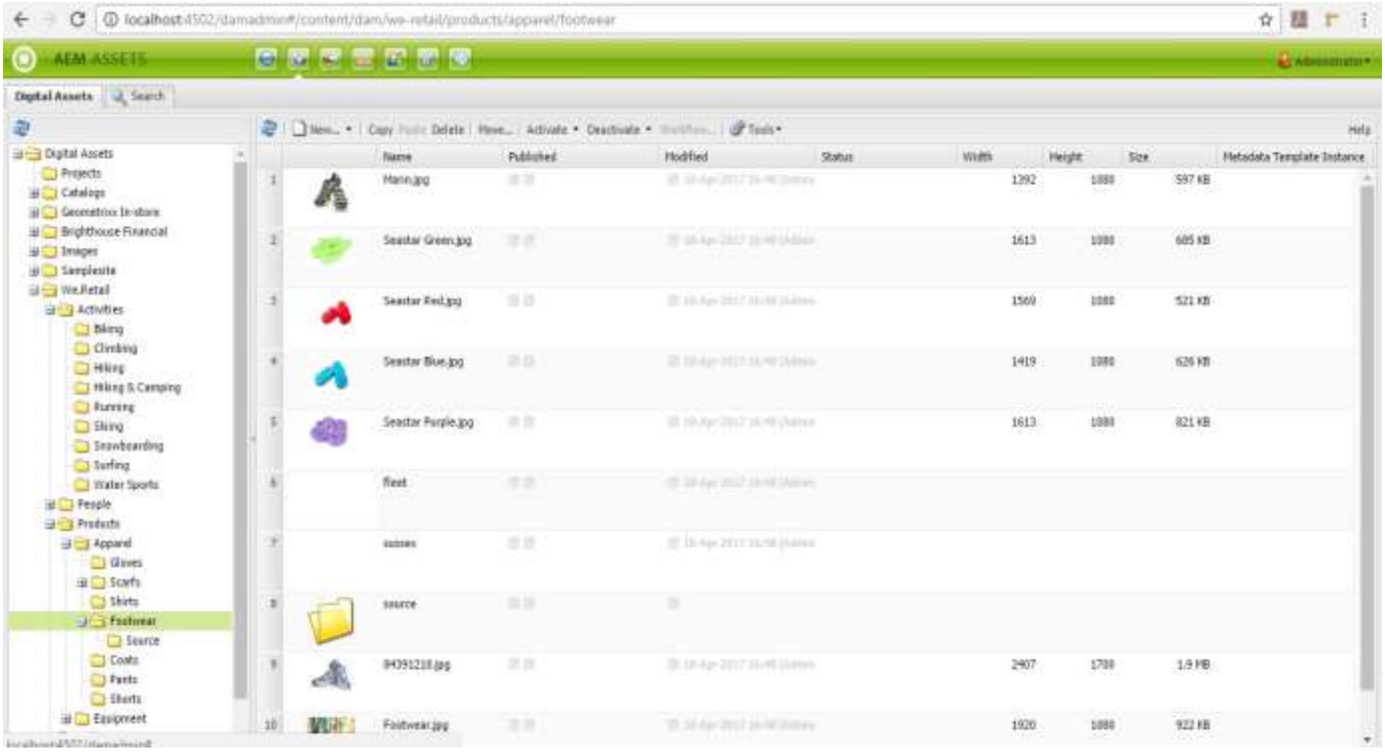
Ty...	ID	Name	Pub.	Mod.
	account-manager	account-manager		
	activity-service	activity-service		
	activitypurgesrv	activitypurgesrv		
	admin	Administrator		
	administrators	administrators		
	analytics-administrators	Analytics Admini...		
	analytics-content-updater-s...	analytics-content...		
	analyticsservice	analyticsservice		
	anonymous	anonymous		
	assetlinkshareservice	assetlinksharese...		
	assetusagetrackeruser	assetusagetracke...		
	audiencemanager-configlis...	audiencemanage...		
	audiencemanager-syncsegm...	audiencemanage...		
	audit-service	audit-service		
	authentication-service	authentication-s...		
	campaign-cloudservice	campaign-clouds...		
	campaign-reader	campaign-reader		
	campaign-remote	campaign-remote		
	canvaspage-activate-service	canvaspage-activ...		
	canvaspage-delete-service	canvaspage-dele...		
	clientlibs-service	clientlibs-service		
	commerce-backend-service	commerce-backe...		

administrators

Path	Read	Modify	Create	Delete	Read ACL	Edit ACL	Replicate	
	☑	☑	☑	☑	☑	☑	☑	Details
apps	☑	☑	☑	☑	☑	☑	☑	Details
bin	☑	☑	☑	☑	☑	☑	☑	Details
conf	☑	☑	☑	☑	☑	☑	☑	Details
content	☑	☑	☑	☑	☑	☑	☑	Details
etc	☑	☑	☑	☑	☑	☑	☑	Details
home	☑	☑	☑	☑	☑	☑	☑	Details
libs	☑	☑	☑	☑	☑	☑	☑	Details
oak:index	☑	☑	☑	☑	☑	☑	☑	Details
system	☑	☑	☑	☑	☑	☑	☑	Details
tmp	☑	☑	☑	☑	☑	☑	☑	Details
var	☑	☑	☑	☑	☑	☑	☑	Details

Fig 3.6 User Access Rights

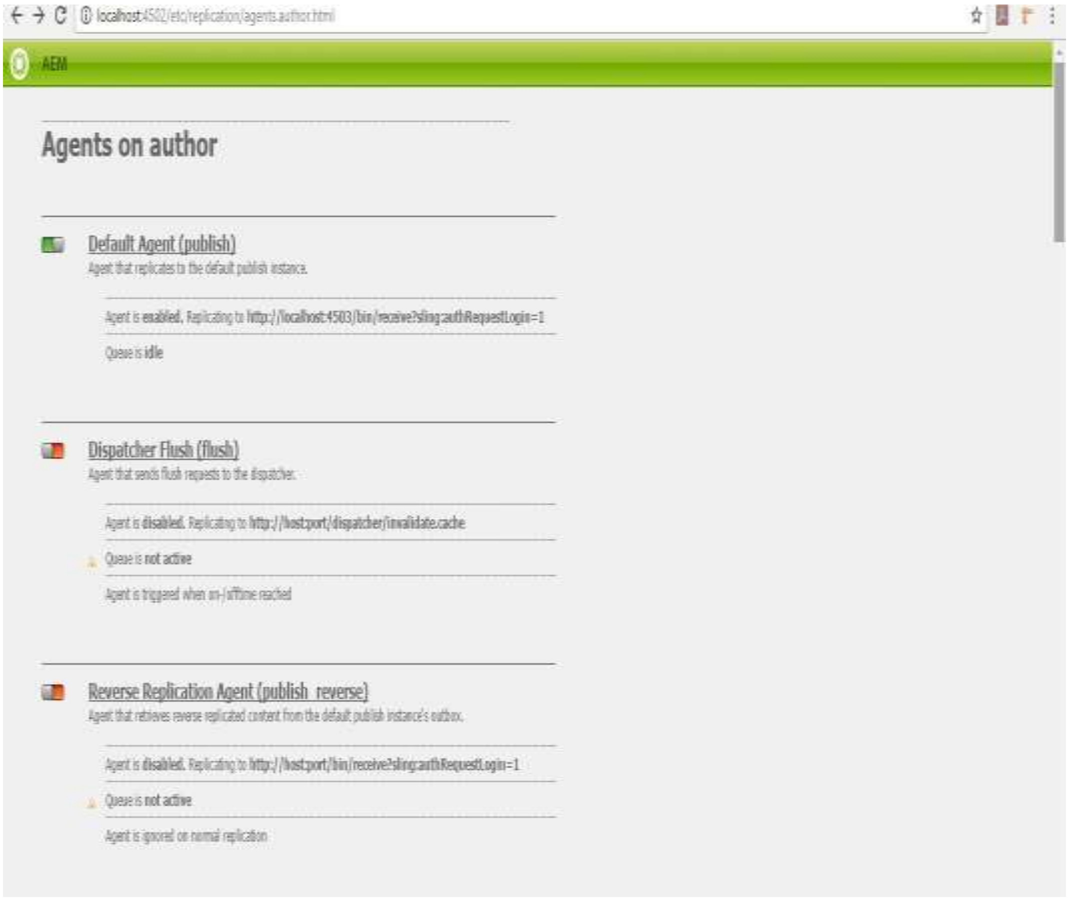
We can see the different types of permissions for all the directories provided to a user in the above figure.



	Name	Published	Modified	Status	Width	Height	Size	Metadata Template Instance
1	Marin.jpg		[illegible]		1392	1088	597 KB	
2	Seastar Green.jpg		[illegible]		1613	1088	685 KB	
3	Seastar Red.jpg		[illegible]		1569	1088	521 KB	
4	Seastar Blue.jpg		[illegible]		1419	1088	626 KB	
5	Seastar Purple.jpg		[illegible]		1613	1088	821 KB	
6	fleet		[illegible]					
7	sussex		[illegible]					
8	source							
9	84391218.jpg		[illegible]		2407	1788	1.9 MB	
10	Footwear.jpg		[illegible]		1920	1088	922 KB	

Fig. 3.7 AEM DAM admin

The above figures shows us the DAM admin hierarchy where all the images, files, folders, videos and all the other assets related to a project are stored.



Agents on author

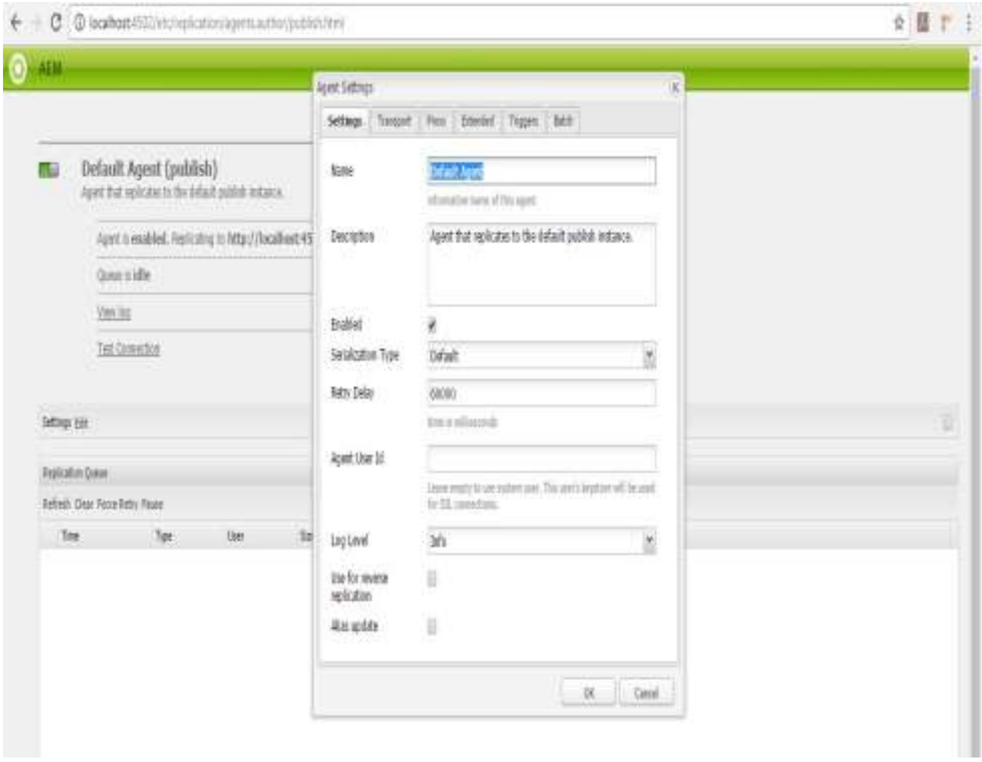
Default Agent (publish)
Agent that replicates to the default publish instance.
Agent is enabled. Replicating to http://localhost:4503/bin/receive?sling:authRequestLogin=1
Queue is idle

Dispatcher Flush (flush)
Agent that sends flush requests to the dispatcher.
Agent is disabled. Replicating to http://host:port/dispatcher/invalidate.cache
Queue is not active
Agent is triggered when on-/offtime reached

Reverse Replication Agent (publish_reverse)
Agent that retrieves reverse replicated content from the default publish instance's outbox.
Agent is disabled. Replicating to http://host:port/bin/receive?sling:authRequestLogin=1
Queue is not active
Agent is ignored on normal replication

Fig 3.8 AEM Replication Agents

This figure shows us the pane about task's-replication. It contains a screen that displays the configuration of agents on author instance namely replication-agent and reverse-replication agent. Every agent can be configured in accordance our project's requirement. Moreover different categories exist as there are different types of agents.



localhost:4502/etc/replication/agents.author/publish.html

Default Agent (publish)

Agent that replicates to the default publish instance.

Agent is enabled. Replicating to http://localhost:45

Queue is idle

Agent Settings

Name: Default Agent

Description: Agent that replicates to the default publish instance.

Enabled: ☑

Serialization Type: Default

Retry Delay: 60000

time in milliseconds

Agent User Id:

Leave empty to use system user. This user's keystore will be used for SSL connections.

Log Level: Info

Use for reverse replication: □

Alias update: □

Fig 3.9 Replication Agent Configuration

The figure below shows creation of Templates in AEM. Templates in AEM have following properties:

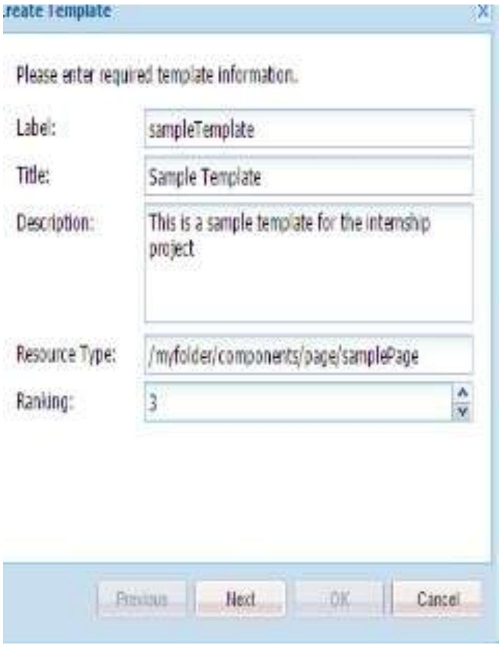
Label: It can be considered as the name of the template

Title: It can be considered as the name with which the template gets saved and is referenced in the JCR.

ResourceType: It can be defined as a reference that links a page component to a predefined resource in the JCR repository which helps in rendering the pages that are created with these templates when they are selected.

Rank: It defines the order in which the template would be seen when we create a page using it.

Allowed Paths: This property allows a template to be used in specific paths and not others.



Please enter required template information.

Label: sampleTemplate

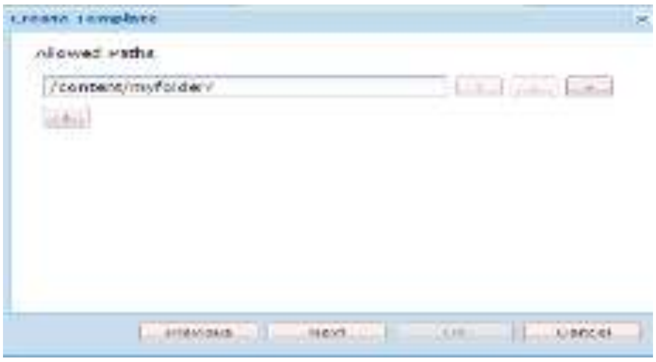
Title: Sample Template

Description: This is a sample template for the internship project

Resource Type: /myfolder/components/page/samplePage

Ranking: 3

Fig 3.10 AEM Template Creation



Allowed Paths

/content/myfolder/

Fig 3.11 Templates Allowed Paths

3.2. PROJECT WORK

The project that we worked on served a client in India. We developed a survey form for them that was made using AEM Forms. We follow Agile methodology for developing the project, where we develop the project to a particular point and then give demo to the client. After the demo we work on the feedback provided by the client and this cycle continues till the complete project is developed. The project has been divided into 4 major parts, we have delivered 2 parts of the project and now the last 2 parts are meant to be submitted by 15th June 2020. For making any form there are basically three steps involved:

- Firstly creating the XSD for the form that can be defined as the outline for the entire structure of the form. It contains various fields and panels for a form. It also helps in storing the data filled in the form in a XML format, which can be used to later to prefill new forms or update the database.
- Second step includes authoring the form so that we have a proper visual interface to interact with. Which includes labelling the fields and deciding the final view of the Form.
- The third step includes writing various rules on the form for different validations, soft checks and functionality of the form. This helps us in automating various user experiences in the Form and mitigating human error while filling the form.

Other than Forms other major projects in our organization include developing AEM sites. For creating sites AEM sites is used. It consists of various reusable components that are made by various members of our team using AEM. The components give power to even non-technical users to drag and drop them on the different pages of the website which then become ready to be published, thus enabling them to author their own websites. There are generally two environments: The author environment and the Publish environment. Author does the changes to the website which is also termed as authoring, the author decides the content to be shown on the website . This instance is then sent to the publisher whose job is to verify the components on the page and the structure of the page. Then the project's final build would be uploaded on prod. server that ensures that the website is visible to the general public and customers. The various parts in Adobe Experience Manager are built using:

HTML/ CSS : It is used in making the design and look of a website .

Sightly: It is a HTML Templating Language to create a connection with the backend and front end of our website

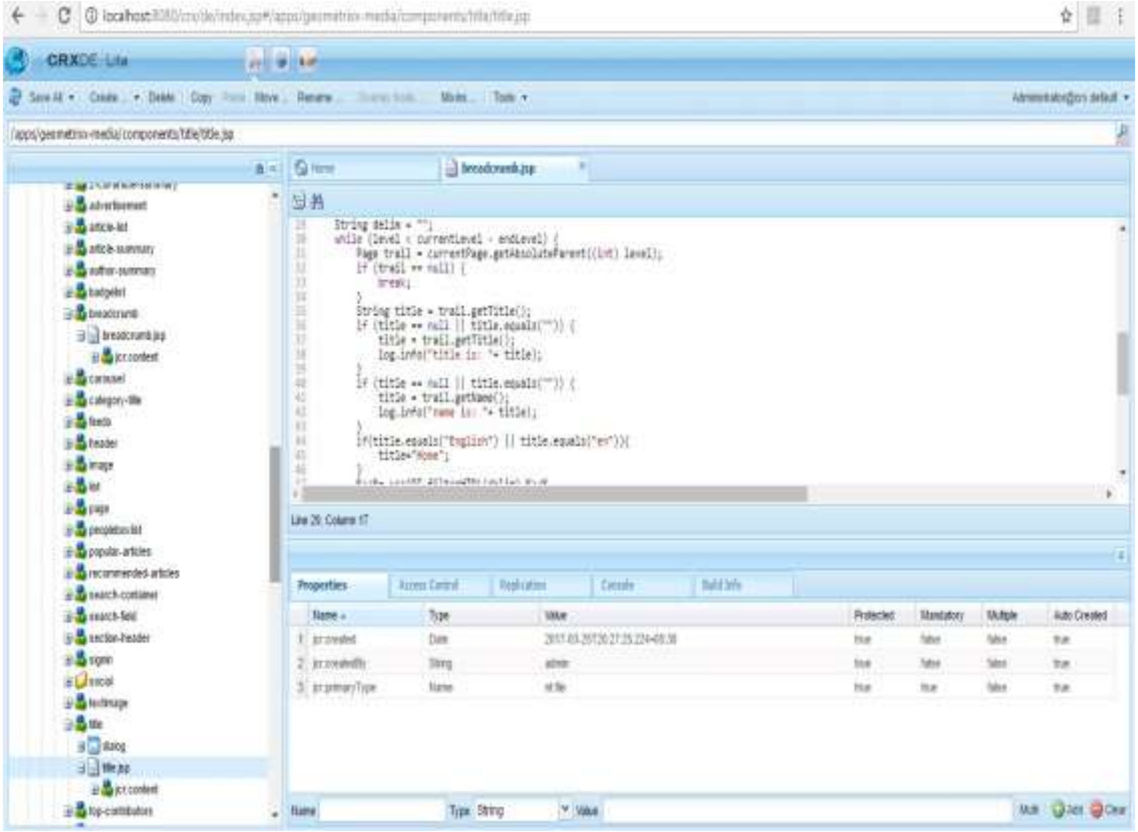
JavaScript: It is used to build the clientside functionality of the website.

Java: It is used in various things like OSGI services, Servlets, Models, Sling Models, OSGI Configurations, Workflows etc. for creating the backend code that is executed hidden behind the components. This is basically used to write the business logic that resides on the server.

Components provide dialogs, which are used as an interface for editing and configuring them. Dialouges are made in Content Repository Extreme as nodes where a specific structure is followed in creating them. The content is provided by the creators which gets pushed as the final view of the website. Also CSS is used to change the design and look of web pages as given int the SRS. JavaScript helps in handling client side actions and various events on the frontend.

IntelliJ is made use of for the Java coding however, Eclipse can be used too to implement backend code.

Firstly templates are created whenever we want to create a new project, after which pages are created which decides the overall structure of our project. To make a new page it is necessary to make a template and page-component in our website. Basically the template is the foundation and therefore decides the overall structure for a selected sort of web-page. For making a page within the website-tab every user has got to make a selection for the type of template to be used, it can be either present by default or made exclusively according to the requirement by various Java-developers. A template contains various components that are dragged on to a page whenever a page is created using that template.



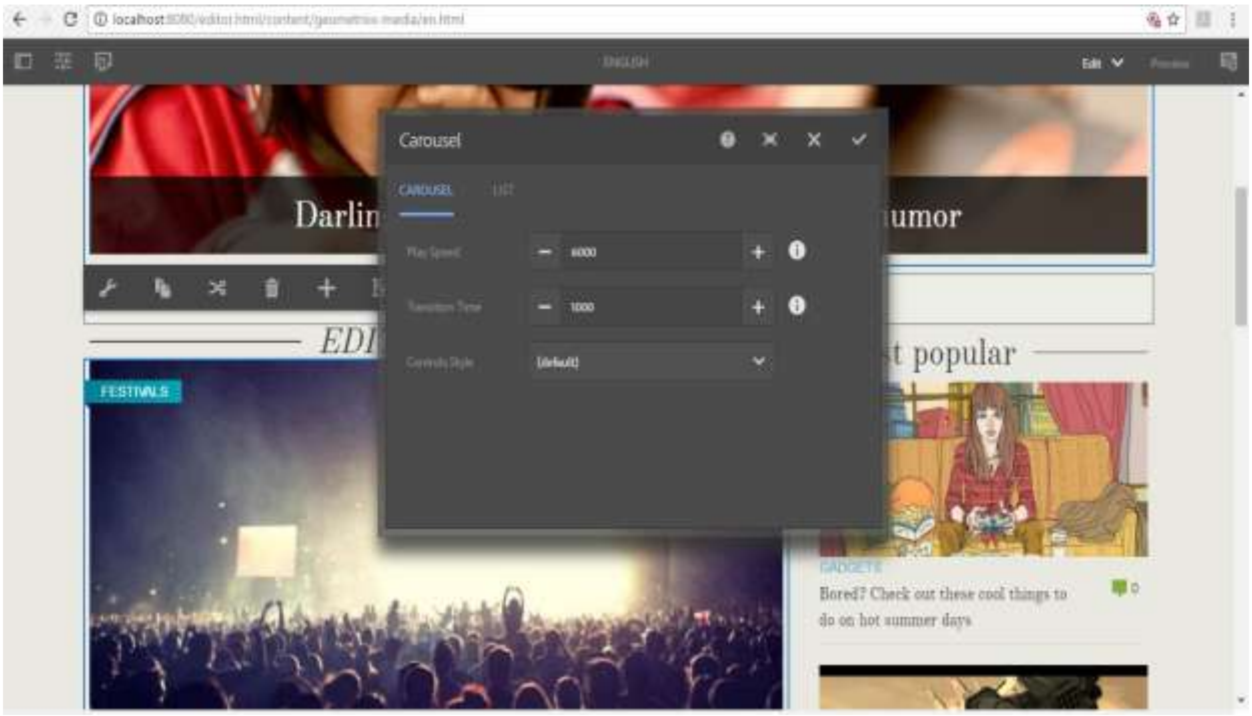
```
    String delim = "";
    while (level < currentLevel - endLevel) {
        Page trail = currentPage.getAbsoluteParent((int) level);
        if (trail == null) {
            break;
        }
        String title = trail.getTitle();
        if (title == null || title.equals("")) {
            title = trail.getTitle();
            log.info("title is: "+ title);
        }
        if (title == null || title.equals("")) {
            title = trail.getName();
            log.info("name is: "+ title);
        }
        if(title.equals("English") || title.equals("en")){
            title="Home";
        }
```

Line 20, Column 17

	Name	Type	Value	Protected	Mandatory	Multiple	Auto Created
1	jcr:created	Date	2017-03-20T20:27:25.224+05:30	true	false	false	true
2	jcr:createdBy	String	admin	true	false	false	true
3	jcr:primaryType	Name	nt:file	true	true	false	true

Fig 3.12: Content Repository Extreme DE

The above figure shows the component's html page and its hierarchy is given on the left panel.



Carousel

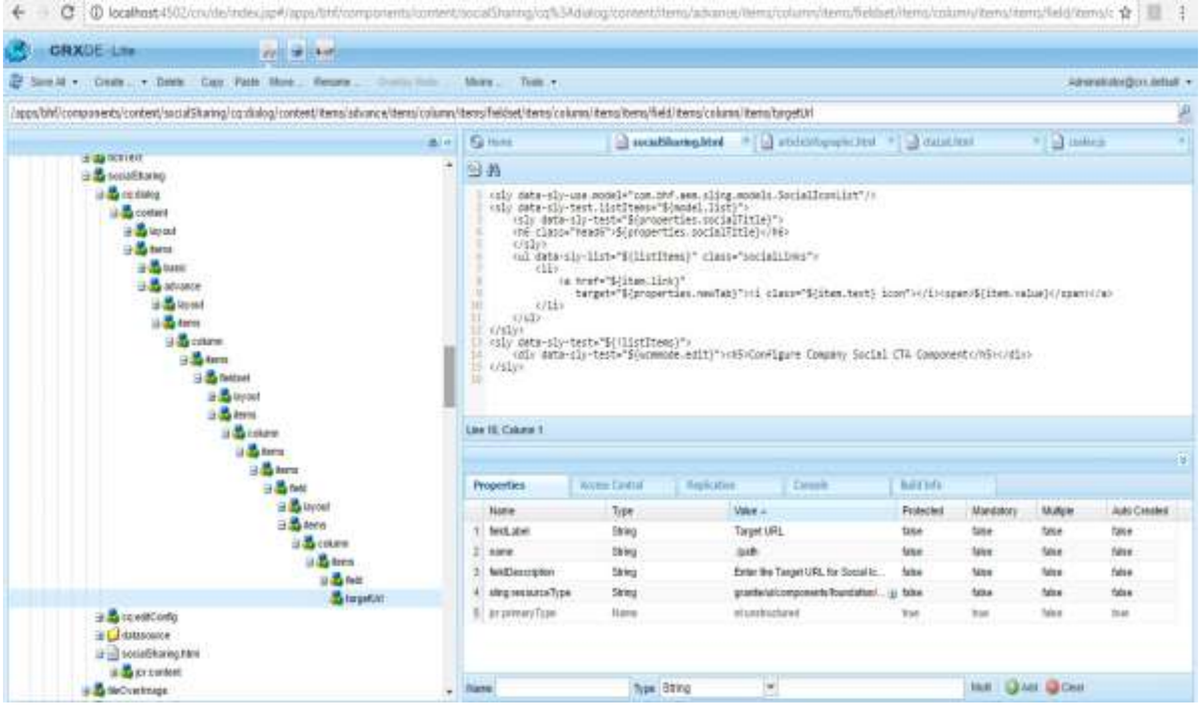
CAROUSEL | LIST

Play Speed: 6000

Transition Time: 1000

Controls Style: [default]

Fig 3.13 Dialog for component



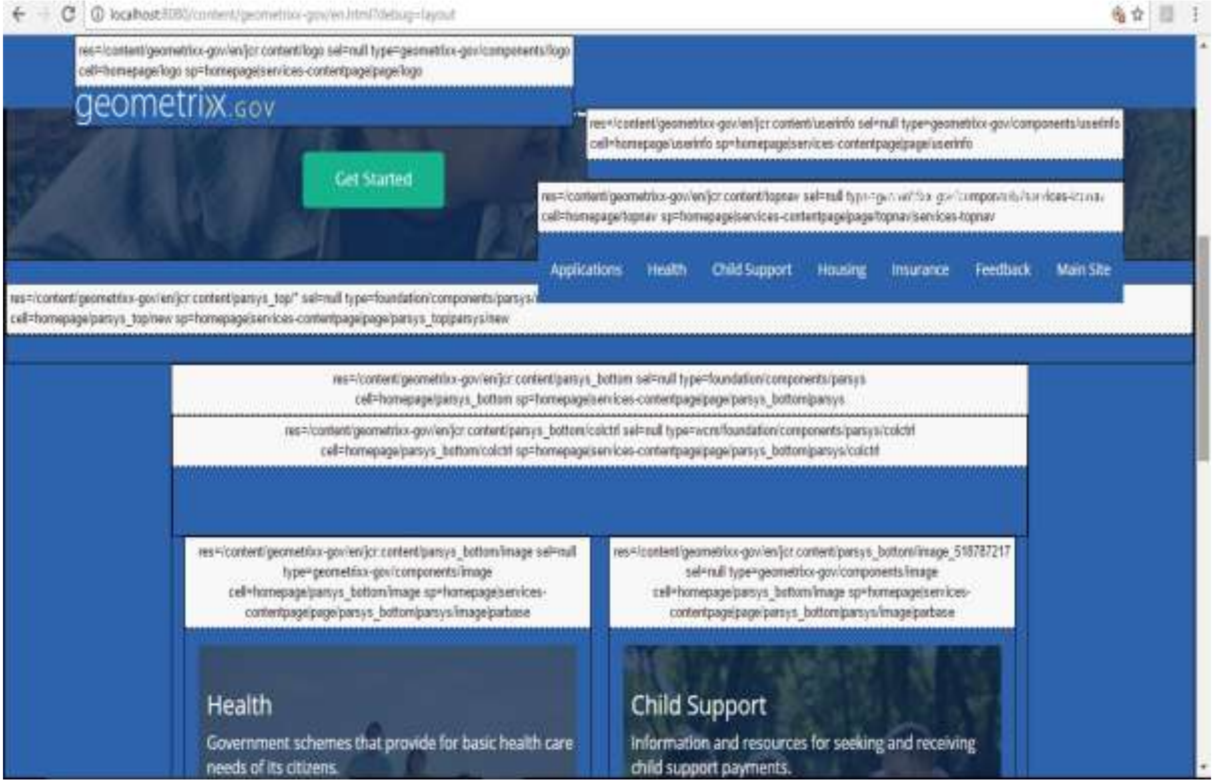
```
<sly data-sly-use.model="com.bhf.aem.sling.models.SocialIconList"/>
<sly data-sly-test.listItems="${model.list}">
    <sly data-sly-test="${properties.socialTitle}">
    <h6 class="head6">${properties.socialTitle}</h6>
    </sly>
    <ul data-sly-list="${listItems}" class="socialLinks">
        <li>
            <a href="${item.link}"
              target="${properties.newTab}"><i class="${item.text} icon"></i><span>${item.value}</span></a>
        </li>
    </ul>
</sly>
<sly data-sly-test="${!listItems}">
    <div data-sly-test="${wcmmode.edit}"><h5>Configure Company Social CTA Component</h5></div>
</sly>
```

Line 16, Column 1

	Name	Type	Value	Protected	Mandatory	Multiple	Auto Created
1	fieldLabel	String	Target URL	false	false	false	false
2	name	String	./path	false	false	false	false
3	fieldDescription	String	Enter the Target URL for Social Ic...	false	false	false	false
4	sling:resourceType	String	granite/ui/components/foundation/...	false	false	false	false
5	jcr:primaryType	Name	nt:unstructured	true	true	false	true

Fig 3.14 Component (socialSharing)

The image above shows a component in the project. This component presents the user with social media links. The component is a container with a special resource type and a dialog. The dialog contains various widgets. The widgets are usually taken from the Touch UI Library. This project uses the ‘Granite’ version of the Touch UI Library. Different widgets are used to provide different features. At the bottom of the hierarchy, a ‘*textfield’* and a *‘pathbrowser’* widgets are used. The ‘*textfield’* widget is used to specify the name that renders on the webpage and the ‘*pathbrowser’* widget is used to specify the URL for the given social media link. The dialogs can contain any number of widgets from the Granite Library. The information stored in dialog is used to render the webpage. The layout of the dialog varies with the requirements of the clients and the structure being used in the project etc.

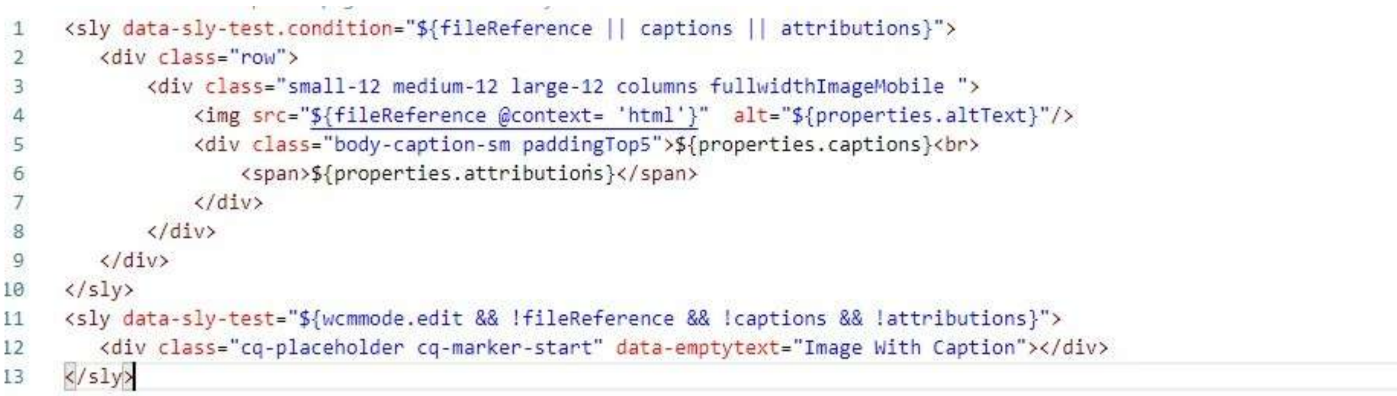


```
res=/content/geometrixx-gov/en/jcr:content/logo sel=null type=geometrixx-gov/components/logo
cell=homepage/logo sp=homepage|services-contentpage|page/logo

res=/content/geometrixx-gov/en/jcr:content/userinfo sel=null type=geometrixx-gov/components/userinfo
cell=homepage/userinfo sp=homepage|services-contentpage|page/userinfo

res=/content/geometrixx-gov/en/jcr:content/topnav sel=null type=geometrixx-gov/components/services-topnav
cell=homepage/topnav sp=homepage|services-contentpage|page/topnav/services-topnav

res=/content/geometrixx-gov/en/jcr:content/parsys_top/* sel=null type=foundation/components/parsys/
cell=homepage/parsys_top/new sp=homepage|services-contentpage|page/parsys_top|parsys/new

res=/content/geometrixx-gov/en/jcr:content/parsys_bottom sel=null type=foundation/components/parsys
cell=homepage/parsys_bottom sp=homepage|services-contentpage|page/parsys_bottom|parsys

res=/content/geometrixx-gov/en/jcr:content/parsys_bottom/colctrl sel=null type=wcm/foundation/components/parsys/colctrl
cell=homepage/parsys_bottom/colctrl sp=homepage|services-contentpage|page/parsys_bottom|parsys/colctrl

res=/content/geometrixx-gov/en/jcr:content/parsys_bottom/image sel=null
type=geometrixx-gov/components/image
cell=homepage/parsys_bottom/image sp=homepage|services-
contentpage|page/parsys_bottom|parsys/image|parbase

res=/content/geometrixx-gov/en/jcr:content/parsys_bottom/image_518787217
sel=null type=geometrixx-gov/components/image
cell=homepage/parsys_bottom/image sp=homepage|services-
contentpage|page/parsys_bottom|parsys/image|parbase
```

localhost:8080/content/geometrixx-gov/en.html?debug=layout
geometrixx.gov
Get Started
Applications
Health
Child Support
Housing
Insurance
Feedback
Main Site
Health
Government schemes that provide for basic health care needs of its citizens.
Child Support
Information and resources for seeking and receiving child support payments.

Fig 3.15 Various components used in a webpage.

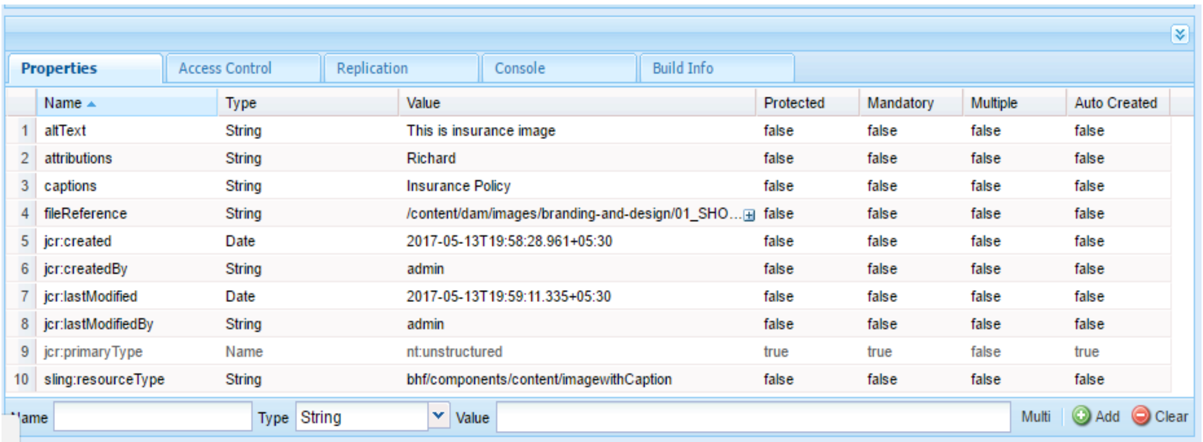
Following is an example of code using both front-end HTML and back-end logic written in HTL (HTML Template Language).



```
<sly data-sly-test.condition="${fileReference || captions || attributions}">
    <div class="row">
        <div class="small-12 medium-12 large-12 columns fullwidthImageMobile ">
            <img src="${fileReference @context= 'html'}"  alt="${properties.altText}"/>
            <div class="body-caption-sm paddingTop5">${properties.captions}<br>
                <span>${properties.attributions}</span>
            </div>
        </div>
    </div>
</sly>
<sly data-sly-test="${wcmmode.edit && !fileReference && !captions && !attributions}">
    <div class="cq-placeholder cq-marker-start" data-emptytext="Image With Caption"></div>
</sly>
```

Fig. 3.16. HTL with Sling Models

HTL is also known as *Sightly*. The code example shared above is very minimalist example where an Image is rendered along with a caption using HTML. Sightly can check whether a property exists or not in the JCR. Sightly can also be used the fetch those values from the component and get that content across to the DOM where front-end libraries can do their work. The '*fileReference'* property in the above example is used to store the path where the image is found.



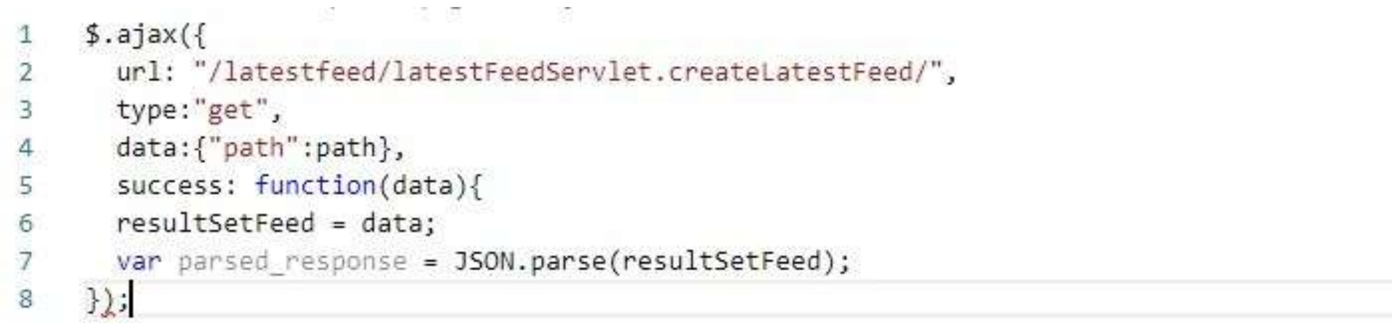
	Name ▲	Type	Value	Protected	Mandatory	Multiple	Auto Created
1	altText	String	This is insurance image	false	false	false	false
2	attributions	String	Richard	false	false	false	false
3	captions	String	Insurance Policy	false	false	false	false
4	fileReference	String	/content/dam/images/branding-and-design/01_SHO…	false	false	false	false
5	jcr:created	Date	2017-05-13T19:58:28.961+05:30	false	false	false	false
6	jcr:createdBy	String	admin	false	false	false	false
7	jcr:lastModified	Date	2017-05-13T19:59:11.335+05:30	false	false	false	false
8	jcr:lastModifiedBy	String	admin	false	false	false	false
9	jcr:primaryType	Name	nt:unstructured	true	true	false	true
10	sling:resourceType	String	bhf/components/content/imagewithCaption	false	false	false	false

Fig 3.17. JCR properties (Key : Value pairs)

The components developed during the internship were similar to the ones found in most modern websites such as a navigation bar, modified multifield components, logo, login, hero component, latest feed and various other modifications to improve the authoring experience.

Navigation Bar Component uses many APIs provided by AEM such as the Page API. AEM provides numerous Java APIs to provide back-end logic to the components. Using these Java

APIs along with the front-end code complete a component. If logic is written on the front-end it is done so with the help of Javascript. In the logo component, the HTML in the DOM needs to be integrated with the Sightly code written in the component. Generic Components can also be developed. These components can be used at more than one place depending on how they were authored. AEM also provides a feature called ‘ClientLib’ short for Client Library Folder where the client side libraries can be loaded directly from the server. Styling defined in the ClientLib can be used in the front-end with the help of Sightly. The Latest feed component shows the most recent posts shared on the site. This component uses Java code, Javascript logics as well as front-end templates.



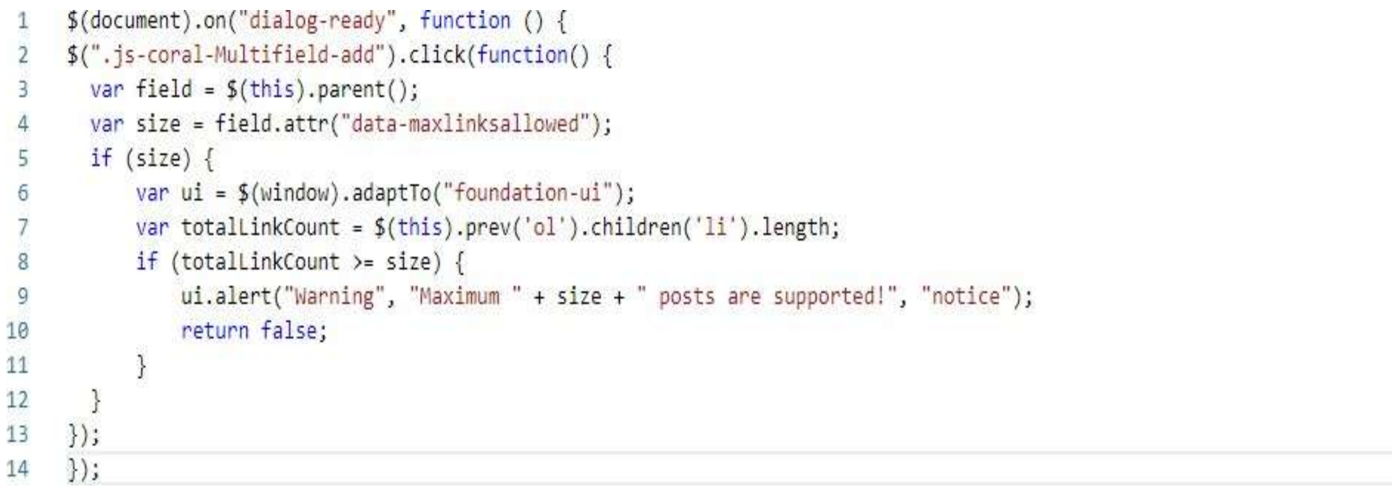
```
$.ajax({
  url: "/latestfeed/latestFeedServlet.createLatestFeed/",
  type:"get",
  data:{"path":path},
  success: function(data){
  resultSetFeed = data;
  var parsed_response = JSON.parse(resultSetFeed);
});
```

Fig. 3.18. Async JS code

The above code shows a simple HTTP GET Request to send data to Java servlet. Using HTTP GET Requests, we can retrieve information from the back-end without refreshing the page. The above example shows a asynchronous request to a JAVA servlet which sends response in JSON format. The JSON in the response can be parsed which can be passed on to the HTML.

Many a times, the features provided by AEM are not enough to meet the requirements of the project. In such cases developers are required to write JavaScript classes on their own to overcome the specific issue. For example we can make a custom implementation of the nested multfield component to store information about the countries and the also the information about the states inside the country. This way we do not limit the number of states being stored, also we make the data more organized and structureThe code in the example above creates a

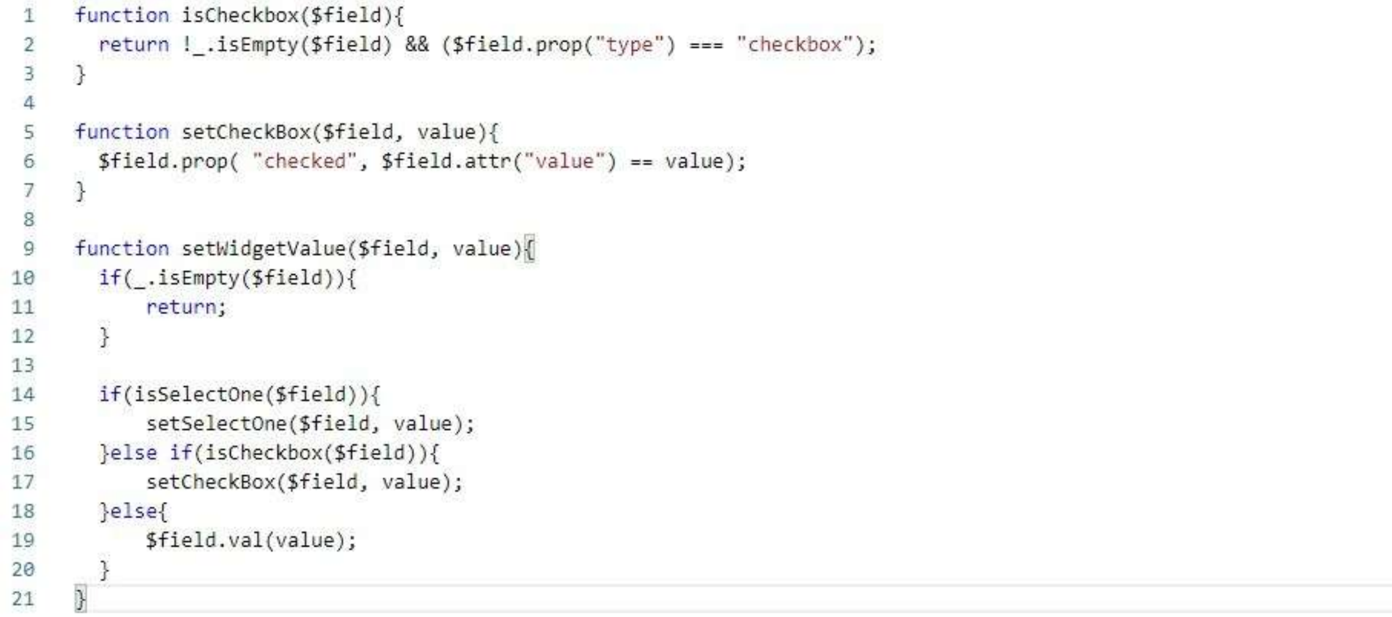
property with the name of *‘maxlinksallowed’* to be used in the custom implementation.



```
$(document).on("dialog-ready", function () {
$(".js-coral-Multifield-add").click(function() {
  var field = $(this).parent();
  var size = field.attr("data-maxlinksallowed");
  if (size) {
      var ui = $(window).adaptTo("foundation-ui");
      var totalLinkCount = $(this).prev('ol').children('li').length;
      if (totalLinkCount >= size) {
          ui.alert("Warning", "Maximum " + size + " posts are supported!", "notice");
          return false;
      }
  }
});
});
```

Fig. 3.19. Custom Multifield.

Also custom checkboxes will require custom Javascript written to validate their values as shown in the *'isCheckBox'* funtion in the code below



```
function isCheckbox($field){
  return !_.isEmpty($field) && ($field.prop("type") === "checkbox");
}

function setCheckBox($field, value){
  $field.prop( "checked", $field.attr("value") == value);
}

function setWidgetValue($field, value){
  if(_.isEmpty($field)){
      return;
  }

  if(isSelectOne($field)){
      setSelectOne($field, value);
  }else if(isCheckbox($field)){
      setCheckBox($field, value);
  }else{
      $field.val(value);
  }
}
```

Fig. 3.20. Custom Multifield(b)

CHAPTER 4

PERFORMANCE ANALYSIS

In Web Content Projects, performance is measured by the amount of time a web server takes to respond to all of the client's requests

4.1. OPTIMIZING PERFORMANCE

To optimize performance, the following five points help.

1. Load Planning

Before the actual launch of the product, an early access version of the product is made available to a smaller audience to gather performance data in a real-life setting.

2. Simulating Real Load

To avoid performance drops after the launch of the product, the performance of the product can be tested with real-life like environment. A "Real-life like environment " means that the size of the content, the traffic and the size of the code needs to be similar to their counterparts after the launch of the product.

3. Performance Benchmarks

To compare the performance achieved by the product, it must be compared to a benchmark result obtained on a similar product.

4.Relevance to Optimization

Only those things should be optimized that are relevant to bringing about improvements to the performance

5. Iterative Optimization (The Agile Way)

Parallelization and optimization should be done in small iterative steps so that the affect of the optimization can be measured. As a rule of thumb, optimizing and parallelizing every single thing in a project is not recommended

Reference Page Loading Times Recommended by Adobe.

70% of the page requests should get a response in less than 100ms. 25% of the page requests should be responded within 100ms-300ms. 4% of the page requests should be responded within 300ms-500ms. 1% of the page requests should be responded within 500ms-1000ms. No pages request should get a response in more than 1 second.

General Steps to Improve Performance

Using Queries inside display templates increases the inefficiency of the dispatcher cache leads to performance issues. Tuning the parameters of the OS and JVMdoes not impact performance.

Keeping Track of Performance

Performance can be monitored by tracking the various performance attributes.

1. Backup plan in case things don’t go as planned.

2. A ticket based bug handling system like JIRA should be available for reporting problems.

3. Monitoring File systems and Log files.

4. Version Purging

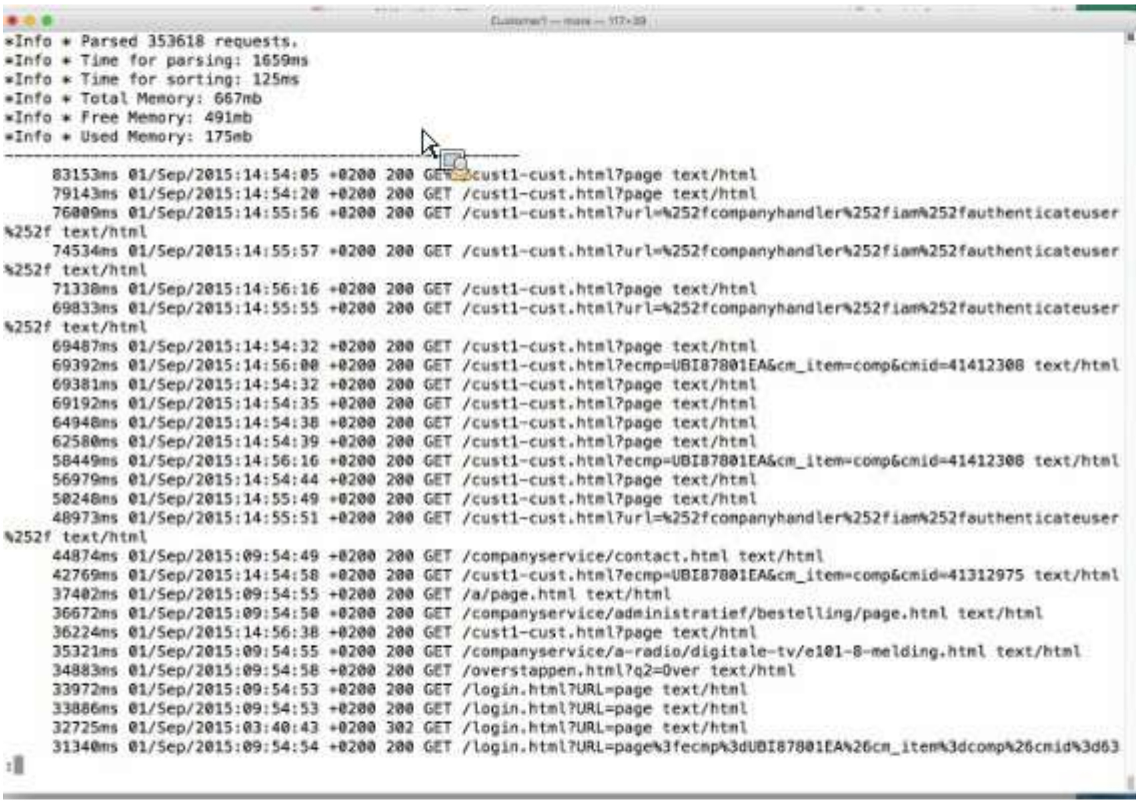
4.2 INTERPRETING THE REQUEST.LOG

- In AEM the request logs are analyzed using ‘rlog.jar’. This tool can filter and rank the requests, since AEM can log thousands of requests in an hour.

- There are more such tools available in AEM in the location ‘/crx-quickstart/opt/helpers,

Command to rank log requests

java -jar ../opt/helopers/rlog.jar -xdev request.log | less



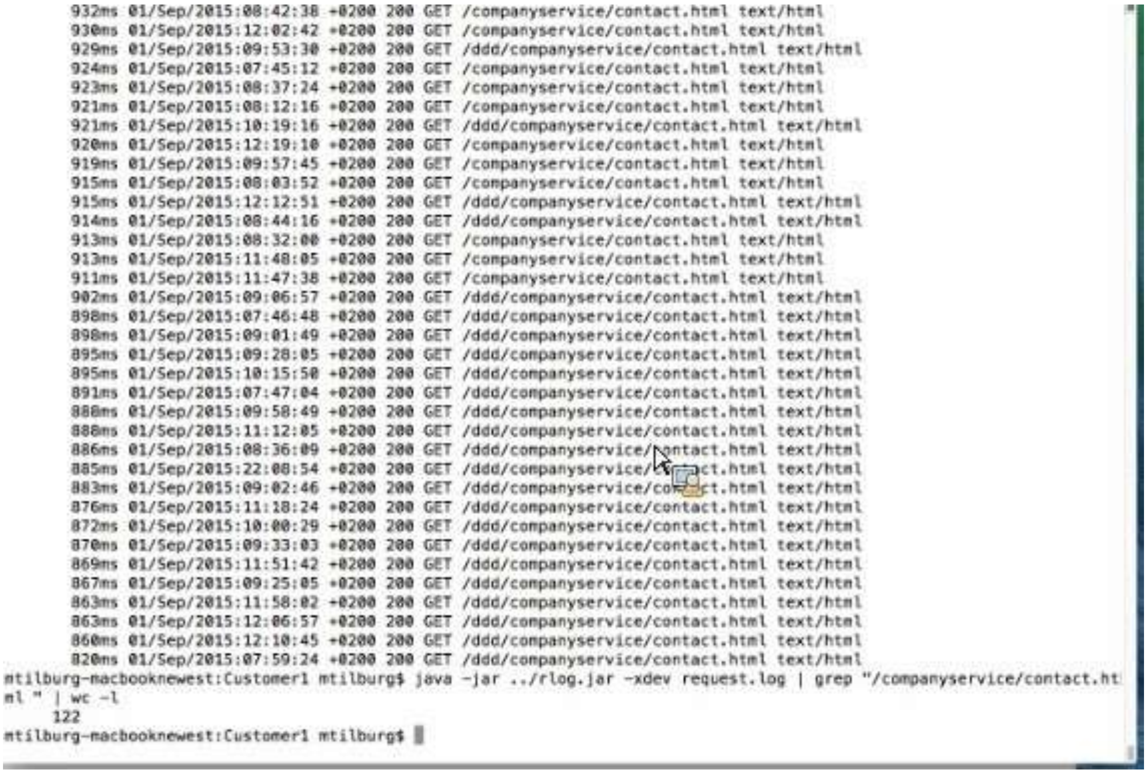
```
*Info * Parsed 353618 requests.
*Info * Time for parsing: 1659ms
*Info * Time for sorting: 125ms
*Info * Total Memory: 667mb
*Info * Free Memory: 491mb
*Info * Used Memory: 175mb
--------------------------------------------------------------
     83153ms 01/Sep/2015:14:54:05 +0200 200 GET /cust1-cust.html?page text/html
     79143ms 01/Sep/2015:14:54:20 +0200 200 GET /cust1-cust.html?page text/html
     76009ms 01/Sep/2015:14:55:56 +0200 200 GET /cust1-cust.html?url=%252fcompanyhandler%252fiam%252fauthenticateuser
%252f text/html
     74534ms 01/Sep/2015:14:55:57 +0200 200 GET /cust1-cust.html?url=%252fcompanyhandler%252fiam%252fauthenticateuser
%252f text/html
     71338ms 01/Sep/2015:14:56:16 +0200 200 GET /cust1-cust.html?page text/html
     69833ms 01/Sep/2015:14:55:55 +0200 200 GET /cust1-cust.html?url=%252fcompanyhandler%252fiam%252fauthenticateuser
%252f text/html
     69487ms 01/Sep/2015:14:54:32 +0200 200 GET /cust1-cust.html?page text/html
     69392ms 01/Sep/2015:14:56:00 +0200 200 GET /cust1-cust.html?ecmp=UBI87801EA&cm_item=comp&cmid=41412308 text/html
     69381ms 01/Sep/2015:14:54:32 +0200 200 GET /cust1-cust.html?page text/html
     69192ms 01/Sep/2015:14:54:35 +0200 200 GET /cust1-cust.html?page text/html
     64948ms 01/Sep/2015:14:54:38 +0200 200 GET /cust1-cust.html?page text/html
     62580ms 01/Sep/2015:14:54:39 +0200 200 GET /cust1-cust.html?page text/html
     58449ms 01/Sep/2015:14:56:16 +0200 200 GET /cust1-cust.html?ecmp=UBI87801EA&cm_item=comp&cmid=41412308 text/html
     56979ms 01/Sep/2015:14:54:44 +0200 200 GET /cust1-cust.html?page text/html
     50248ms 01/Sep/2015:14:55:49 +0200 200 GET /cust1-cust.html?page text/html
     48973ms 01/Sep/2015:14:55:51 +0200 200 GET /cust1-cust.html?url=%252fcompanyhandler%252fiam%252fauthenticateuser
%252f text/html
     44874ms 01/Sep/2015:09:54:49 +0200 200 GET /companyservice/contact.html text/html
     42769ms 01/Sep/2015:14:54:58 +0200 200 GET /cust1-cust.html?ecmp=UBI87801EA&cm_item=comp&cmid=41312975 text/html
     37402ms 01/Sep/2015:09:54:55 +0200 200 GET /a/page.html text/html
     36672ms 01/Sep/2015:09:54:50 +0200 200 GET /companyservice/administratief/bestelling/page.html text/html
     36224ms 01/Sep/2015:14:56:38 +0200 200 GET /cust1-cust.html?page text/html
     35321ms 01/Sep/2015:09:54:55 +0200 200 GET /companyservice/a-radio/digitale-tv/e101-8-melding.html text/html
     34883ms 01/Sep/2015:09:54:58 +0200 200 GET /overstappen.html?q2=Over text/html
     33972ms 01/Sep/2015:09:54:53 +0200 200 GET /login.html?URL=page text/html
     33886ms 01/Sep/2015:09:54:53 +0200 200 GET /login.html?URL=page text/html
     32725ms 01/Sep/2015:03:40:43 +0200 302 GET /login.html?URL=page text/html
     31340ms 01/Sep/2015:09:54:54 +0200 200 GET /login.html?URL=page%3fecmp%3dUBI87801EA%26cm_item%3dcomp%26cmid%3d63
:
```

Fig. 4.1 Log Requests (Rank).

The above command shows the number of requests logged, sorted by the duration it takes to respond to them in descending order. It is clear from the log that the first request is not cached since it keeps appearing in the log again and again. It can also be noted from the above log that some requests which are not cached can take a lot of time to respond and bring down the performance.

Command to filter log requests

java -jar ../opt/helpers/rlog.jar -xdev request.log | grep "/companyservice/contact.html " | wc -l



```
    932ms 01/Sep/2015:08:42:38 +0200 200 GET /companyservice/contact.html text/html
    930ms 01/Sep/2015:12:02:42 +0200 200 GET /companyservice/contact.html text/html
    929ms 01/Sep/2015:09:53:30 +0200 200 GET /ddd/companyservice/contact.html text/html
    924ms 01/Sep/2015:07:45:12 +0200 200 GET /companyservice/contact.html text/html
    923ms 01/Sep/2015:08:37:24 +0200 200 GET /companyservice/contact.html text/html
    921ms 01/Sep/2015:08:12:16 +0200 200 GET /companyservice/contact.html text/html
    921ms 01/Sep/2015:10:19:16 +0200 200 GET /ddd/companyservice/contact.html text/html
    920ms 01/Sep/2015:12:19:10 +0200 200 GET /companyservice/contact.html text/html
    919ms 01/Sep/2015:09:57:45 +0200 200 GET /companyservice/contact.html text/html
    915ms 01/Sep/2015:08:03:52 +0200 200 GET /companyservice/contact.html text/html
    915ms 01/Sep/2015:12:12:51 +0200 200 GET /ddd/companyservice/contact.html text/html
    914ms 01/Sep/2015:08:44:16 +0200 200 GET /ddd/companyservice/contact.html text/html
    913ms 01/Sep/2015:08:32:00 +0200 200 GET /companyservice/contact.html text/html
    913ms 01/Sep/2015:11:48:05 +0200 200 GET /companyservice/contact.html text/html
    911ms 01/Sep/2015:11:47:38 +0200 200 GET /companyservice/contact.html text/html
    902ms 01/Sep/2015:09:06:57 +0200 200 GET /ddd/companyservice/contact.html text/html
    898ms 01/Sep/2015:07:46:48 +0200 200 GET /ddd/companyservice/contact.html text/html
    898ms 01/Sep/2015:09:01:49 +0200 200 GET /ddd/companyservice/contact.html text/html
    895ms 01/Sep/2015:09:28:05 +0200 200 GET /ddd/companyservice/contact.html text/html
    895ms 01/Sep/2015:10:15:50 +0200 200 GET /ddd/companyservice/contact.html text/html
    891ms 01/Sep/2015:07:47:04 +0200 200 GET /ddd/companyservice/contact.html text/html
    888ms 01/Sep/2015:09:58:49 +0200 200 GET /ddd/companyservice/contact.html text/html
    888ms 01/Sep/2015:11:12:05 +0200 200 GET /ddd/companyservice/contact.html text/html
    886ms 01/Sep/2015:08:36:09 +0200 200 GET /ddd/companyservice/contact.html text/html
    885ms 01/Sep/2015:22:08:54 +0200 200 GET /ddd/companyservice/contact.html text/html
    883ms 01/Sep/2015:09:02:46 +0200 200 GET /ddd/companyservice/contact.html text/html
    876ms 01/Sep/2015:11:18:24 +0200 200 GET /ddd/companyservice/contact.html text/html
    872ms 01/Sep/2015:10:00:29 +0200 200 GET /ddd/companyservice/contact.html text/html
    870ms 01/Sep/2015:09:33:03 +0200 200 GET /ddd/companyservice/contact.html text/html
    869ms 01/Sep/2015:11:51:42 +0200 200 GET /ddd/companyservice/contact.html text/html
    867ms 01/Sep/2015:09:25:05 +0200 200 GET /ddd/companyservice/contact.html text/html
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    863ms 01/Sep/2015:12:06:57 +0200 200 GET /ddd/companyservice/contact.html text/html
    860ms 01/Sep/2015:12:10:45 +0200 200 GET /ddd/companyservice/contact.html text/html
    820ms 01/Sep/2015:07:59:24 +0200 200 GET /ddd/companyservice/contact.html text/html
mtilburg-macbooknewest:Customer1 mtilburg$ java -jar ../rlog.jar -xdev request.log | grep "/companyservice/contact.ht
ml " | wc -l
     122
mtilburg-macbooknewest:Customer1 mtilburg$ 
```

Fig. 4.2 Log requests (Filter)

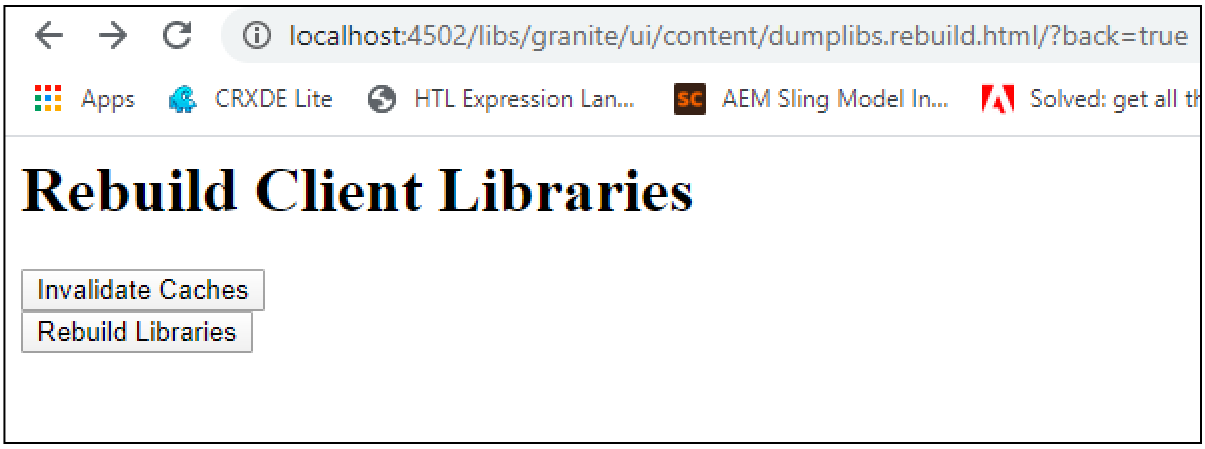
The above command filters the requests made to the webpage ***"/companyservice/contact.html* “ .** As we can see the requests to this page are served in a shorter time, this page must have been cached by the dispatcher.

Command to Save the filtered requests

java -jar ../opt/helpers/rlog.jar -xdev request.log > demo.txt. This command saves the filtered requests to a text file called *‘demo.txt’*

This is shows us a part of page in the project which helps in making the component wherethe links for going to other websites are provided.

4.3. CLEARING CACHE



Rebuild Client Libraries

Fig 4.3. Invalidate cache

In all of Adobe Experience Manager structures, the client experiences multiple layers of cache when visiting your site. There are 4 different cache layers to consider in a standard Adobe Experience Manager structure. This includes the Web Browser, CDN, Dispatcher and AEM instances. The above figure shows how to clear cache from your AEM's instance.

CHAPTER 5

CONCLUSIONS

5.1. RISK ANALYSIS

We should keep numerous things in mind when we are coding in AEM as it requires unique ability in numerous fields. There are numerous dangers related with the execution.

In adobe manager experience we have different “Out of the box” segments accessible for the utilization of authors which are prone to some errors and requires some changes as per the use case of a real time project. Since, this product was initially developed by Day CQ and then acquired by Adobe after sometime, thus some of the new changes made by Adobe are not completely prepared to-utilize or heated at this point. This makes the reconciliations bulky and present different imperfections. Adobe Experience Manager device isn't a lot of reasonable for independent venture or new businesses making their sites because of the expense brought about in acquisition of the product and significant level of designer skill. Debugger in AEM doesn't work each time as required in light of some unmanaged mistakes.

Some functions of custom components which are not required sometimes in the real case scenario and Javascript should be composed to make the components as per the requirement. Each new form of adobe experience manager has little errors which is caused by current adaptation..

For the ClientLibs in AEM there may be situations when JS does not functions properly on console because of certain parameters which probably won't be bolstered on the programs. There may be situations where cross-site scripting may sneak in and break the code. There are many issues related with JS which can be program explicit, run modes explicit, condition explicit, server explicit and so on. So these issues have to be kept in mind while working on a project.

While working on git and submitting our code to the remote repository one must keep in mind to take pull from the remote repository to remove the conflicts, as it may produce errors in the main project.

5.2. FUTURE SCOPE

The current task has been discharged and the current work is going around altering the functionalities to make them progressively conventional & adaptable. Then further arrivals of a task which will is sensibly separated into parts according to the agile methodology. Thus the procees of the development of websites will change as we can provide the client an ability to change and modify the content on the website without making any major change in the code base of the project. For actualizing it have to adjust the discourse structure and the current segments or the look and requirement of a client according to its needs. This may change the ideal conduct of the current parts by doing a few adjustments in the backend rationale executed in the particular segments. Additionally, numerous new sites are written which has a requirement of extraordinary parts that are layout explicit to expand the pages and substance of the site.

Crafted by the designers will incorporate creation some new segments to satisfy requests of a customer. Additionally, the working of this center involving about the alteration of current parts and inclusion of improved functional requirements by means of front-end and back-end code. It consist of utilization of services and servlets calls as per the the usefulness which is explicit to some prerequisite or actively dependent on certain conditions. These current segments are adjusted as a piece of enhancements so as to make them adaptable to be relocated anyplace on the page. Numerous highlights will be robotized as a major aspect of the arrangement and some powerful highlights will likewise be incorporated for what's to come. It has joining of Adobe’s Analytics part and Adobe Campaign with the current system of computerization and assignment by making distinctive different work processes which will diminish the coding mediation.

The undertaking is being stretched out further so as to take a shot at the login and logout features of the current site. This has further incorporation of customizing the whole processes of login and sin-up that will be classified and taken care of with security layers. It will further incorporate the email functionality which provide better experiences and a more communicative front for a user.

The task can incorporate utilization of AEM Forms to change over the current structure usefulness created with the assistance of HTML and javascript approvals. It can start a process of making the whole site dependent on different AEM product and making reconciliations exceptionally effective.

The extent of learning will stretch out to learning of different highlights explicit to AEM like Adobe Campaigns, different API used in AEM, OSGI configurations, services and servlets, templates, integration of back-end logic with the front-end.

5.3. CONCLUSION

The learning term in this company was advanced with great opportunities as an intern to learn new concepts and a great deal of new innovations was found out during this period hypothetically which was actualized in this live undertaking. It not only focused on merely building our knowledge on high level tools involved in a real time project but also on the building a firm foundation by helping an intern to understand the very basic concepts of java, JavaScript and AEM. Interns were also allowed to put forward their ideas and provide their opinion. Thus this period of internship helped us to understand some very basic concepts and also introduced us to new concepts that will help us to grow in this industry.

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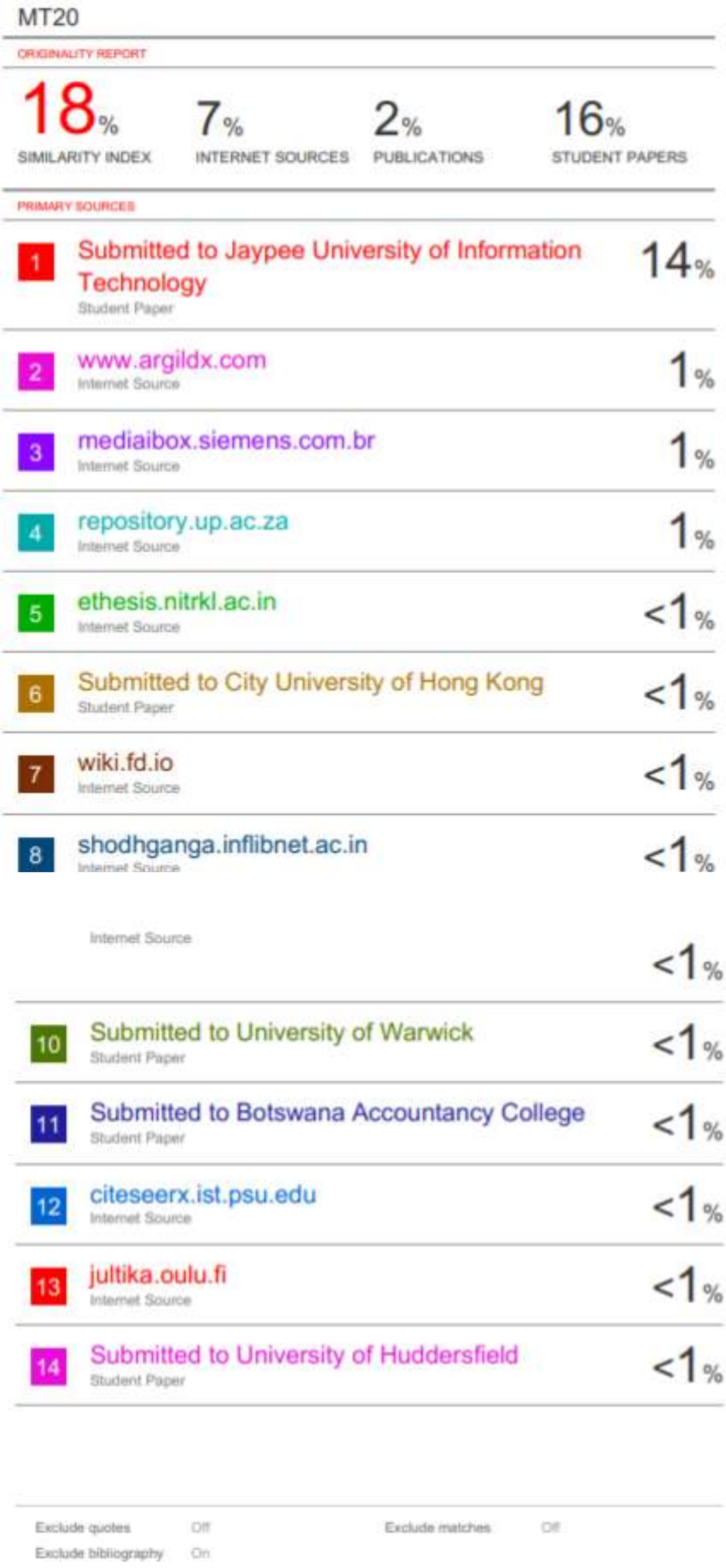

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