

Industrial Training Report

“Web Development using ReactJS and NodeJS”

Submitted in partial fulfilment of the
Requirements for the award of

Degree of Bachelor of Technology in Information Technology

Submitted By

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ACKNOWLEDGEMENT

I hereby declare that the work presented in this report entitled “Web Development using ReactJS and NodeJS”, in partial fulfilment of the requirement for the award of the degree Bachelor of Technology and submitted in Information Technology Department of Maharaja Agrasen Institute of Technology (affiliated to Guru Gobind Singh Indraprastha University, New Delhi) is an authentic record of my own work carried out during the period September 2021.

The work reported in this has not been submitted by me for award of any other degree or diploma of this or any other institute.

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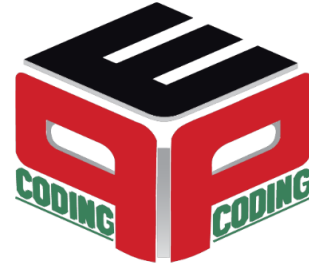
CERTIFICATE

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DATE: 21st September '21

TO WHOM IT MAY CONCERN

This is to certify that Yash Saxena, B.Tech student at Maharaja Agrasen Institute of Technology, Delhi has successfully completed his 2 month training at Pepcoding in our 'Web Development using ReactJS and NodeJS' course from **10th July 2021 to 14th September 2021**. We found him sincere in his work and well-coordinated with his colleagues.

We wish him the best of luck for his bright future.

A handwritten signature in black ink that reads 'Sumeet'.

Sumeet Malik

Director

NOTE: The declaration made in the letterhead is valid only after it has been signed by the director.

PREFACE

This Project Report has been prepared in partial fulfilment of the requirement for the Subject WEB DEVELOPMENT using HTML,CSS, JAVASCRIPT, NODEJS , REACTJS for the program Bachelor of Technology of branch Information Technology in the academic year 2018-2022.

For preparing the Project Report, we have visited the company named PEPCODING EDUCATION PVT. LMT. for the summer training, to avail the internship. The blend of learning and knowledge acquired during our practical studies at the company is presented in this Project Report.

This project report starts with a basic understanding of web development followed by various concepts used in web development which are used to create web sites and handling backend servers and routes.

COMPANY PROFILE

PEPCODING

Pepcoding was founded by Mr. Sumeet Malik with a mission to create skilled software engineers for our country and the world. We aim to bridge the gap between the quality of skills demanded by industry and the quality of skills imparted by conventional institutes..

Vision

To produce coders rich in technical skills so that they can adapt themselves with changing technologies for the development of our country and society.

Objectives-

- Enhance Coding skills of an individual
- Create More Employable Talent
- Make People Fall in Love with Coding
- Unlock new Opportunities
- Connect talent with employers

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CHAPTER - 1

INTRODUCTIONS

1.1 Introduction

The industrial training is compulsory for every student of Bachelor of Technology in Information Technology as a condition for the award of the degree. This exercise is also intended to provide exposure and experience to the students about the real situation in the field of Information Technology and as an early preparation for students before entering the working world.

I found a place to undergo industrial training at National Informatics Centre for the course of Web Development. During this training, I was given the opportunity to follow the learning involved technical assistance related. Computer software that we get helps us understand the needs of business and academic ventures and have a clearer understanding and widespread in the intricacies of information technology (programming).

1.2 The objective of industrial training

Industry training is a major component of the extra-curricular learning in engineering. The students are required to pass before the Industrial Training is recommended for award of a degree at any engineering college. The students will be placed in government departments or private companies for 6 weeks to expose them to a real work environment and different from the atmosphere at the college.

Often students will be faced with many challenges and problems that have not been confronted. The main purpose of this training was to expose students to the real working environment when the students out of the college later.

Students also have the opportunity to use all the knowledge and theories related to courses taken while at the engineering course of industrial training and provide opportunities for students to use the fruit of a creative mind for the good of the firm and indirectly for their own benefit as well. Thus, there has been this experience, maybe can help students to study in the following semester

and a real working environment. Students also can be exposed to ways to communicate well, expanding relationships between partners of the workplace and the people around, foster teamwork and good relations with industrial workers where this at once can cause a sense responsible to a trust (work) and balance as well as from all aspects.

For example, one kind of algorithm is a classification algorithm. It can put data into different groups. The classification algorithm used to detect handwritten alphabets could also be used to classify emails into spam and not-spam. In addition, following the Industrial Training, students can improve their own weaknesses to improve and think more rationally in the handle which had been given by the employer. In the course of industrial training, students can assess their ability to work from employers. The students themselves can infuse the spirit of productivity to the challenges and obstacles that lie ahead.

Hopefully with the Industrial Training which is able to run to enhance the knowledge of students to enable them to contribute more effectively towards national development in the future and also to get a job that suits them according to the skills they have learned. In conclusion, the objective of the training period is to:

- a) To expose students to the real working environment.
- b) Let's students see the connection between theoretical learning with practical work.
- c) Adopt and comply with safety regulations in the industry.
- d) Establish and strengthen confidence in the performance of duties.
- e) Instill teamwork and good relationships with other employees.
- f) Ability to assess themselves to prepare for the working world after graduation.
- g) Raise awareness and increase student interest in the subject selected.
- h) Uplifting honest, trustworthy, dedicated and responsible for the tasks assign

1.3 The objective of industrial training report

Some objectives can be defined and made known in this industrial training report are described as follows:

- i) Be evidence that the student has been training period by a predetermined time period.
- ii) Record all activities during the training period.
- iii) A reference in the future.
- iv) It proves that students understand and appreciate the work done anything during the Industrial Training.
- v) As a reference after the training period in the firm after completed their studies at the Polytechnic.

1.4 The importance of industry training

Industrial Training must be lived by all students in public higher education institutions or Private as a prerequisite for qualifying students receive a Degree in Information Technology is taken. Actually it is not so qualified, but it is to create awareness about the situation in the working environment. With the Industrial Training many useful and valuable experience gained as supply before set foot in the sphere of employment. It also can build confidence with the experience and knowledge available. So quite easy and convenient to carry out the work which will be given later.

Industry training is important because such training can expose students to the real working environment. It also can add and expand technical knowledge and skills of the student, if the student has previously acquired knowledge is limited, but when students attend this training, students can find out more about things, and when something will work. In addition, students can learn about the latest technology or skills in Training Industry.

In addition, this exercise also introduce the students themselves in terms of ability, willingness and attitude to the employer. This exercise can highlight the ability of students to work hard and to work with dedication and show a positive attitude to the employer. This exercise is also important as it can get rid of inferiority complex while a student at the college, but when students are in training it is likely he will meet with officials of high rank or attend meetings and provide jobs to foreign workers.

Through this exercise, students are able to handle a problem with wise through experience that has been through this before. The value of respect for those around him will arise within the student if the student's Industrial Training heart felt and sincere. It is hoped that these properties will be sustained in the future.

The conclusion that can be defined on the importance of industrial training are:

- a) To build and strengthen the students to be more confident to face any task and tribulations faced in the workplace.
- b) Planting teamwork and good relations between workers and employees of an organization.
- c) To expose students to the real working environment.
- d) To make students do not face any difficulty or clumsy when start working soon.
- e) Adopt and comply with safety regulations in the industry.
- f) Linking theory to practice and so on.
- g) Build confidence.
- h) Fostering honesty and responsibility in performing tasks.
- i) Provide an official report on completion of training.

Chapter – 2

WEEKLY JOBS SUMMARY

Overview of Weekly Job Summary:

	Topic 1	Topic 2	Topic 3	Topic 4	Topic 5	Topic 6
Week 1	Web Development overview	HTML basics	Advanced HTML	-----	----- -	-----
Week 2	CSS Basics	Advanced CSS	Bootstrap 4, Templates	Javascript Basics		-----
Week 3	DOM manipulation	Advanced Javascript	Git + Github		----- -	-----
Week 4	NPM+ NPM Scripts	React.js	HTTP/JSON/AJAX		----- --	-----
Week 5	Image Recognition API	Node.js	Express.js			
Week 6	databases	Production + deployment				

Chapter – 3

TECHNICAL CONTENTS

Web development is a broad term for the work involved in developing a website for the Internet (World Wide Web) or an intranet (a private network). Web development can range from developing the simplest static single page of plain text to the most complex web-based internet applications (or just 'web apps') electronic businesses, and social network services. A more comprehensive list of tasks to which web development commonly refers, may include web engineering, web design, web content development, client liaison, client-side/server-side scripting, web server and network security configuration, and e-commerce development. Among web professionals, "web development" usually refers to the main non-design aspects of building web sites: writing markup and coding. Most recently Web development has come to mean the creation of content management systems or CMS. These CMS can be made from scratch, proprietary or open source. In broad terms the CMS acts as middleware between the database and the user through the browser. A principle benefit of a CMS is that it allows non technical people to make changes to their website without having technical knowledge.

For larger organizations and businesses, web development teams can consist of hundreds of people (web developers) and follow standard methods like Agile methodologies while developing websites. Smaller organizations may only require a single permanent or contracting developer, or secondary assignment to related job positions such as a graphic designer or information systems technician. Web development may be a collaborative effort between departments rather than the domain of a designated department. There are three kinds of web developer specialization: front-end developer, back-end developer, and full stack developer. Front-end developers deal with the layout and visuals of a website, while back-end developers deal with the functionality of a website. Back-end developers will program in the functions of a website that will collect data.

3.1 IMPORTANCE OF WEB DEVELOPMENT

As human beings, we pride ourselves on our superb adaptation skills and ability to change with the times. Stemming from this, when the social world shifted from a place of interpersonal connections to internet connections, so did the world of business. There's no getting around it; our digitally-driven lifestyle has given us little choice but to adapt to technology, and if you haven't already, it's time to get a move on. It's a no-brainer; website development is now essential to you as a business person. For your business to generate more business, your voice needs to be heard, your brand needs to be seen, and your goals need to be reached. Web development is the key to making those things happen. The same way an eye is the window to the soul, a website is the window to the business, giving customers a taste of what you have to offer and enticing them to delve deeper for more.

We are simple creatures in that we like convenience, and there's nothing more convenient than accessing a whole host of information by simply clicking a button, which is what millions of people do when they go online every day. If your product can't be found on the other side of that click, you've already lost access to those millions of people, and your company effectively doesn't exist. In conjunction with this, establishing a strong web presence as a business while reaching millions of internet surfers who might become potential clients will elevate your product to a universally compatible entity, even if the service you provide is physically localized to a specific place. So what kind of information is valuable to showcase on your website, in order to leave a maximal impact?

Web development is a way to make people aware of the services and/or products you are offering, understand why your products are relevant and even necessary for them to buy or use, and see which of your company's qualities set it apart from competitors. Displaying this information with high-quality images and thought-out presentation will have a large influence on customers, and it is important to strive towards making your product as relatable and appealing as possible. Additionally, with website development you can:

1. Communicate with your visitors effectively:

Interacting with your audience is vital when it comes to generating more business. It is viable to make a website that enables you to get in touch with your customers and prospects, and you can produce valuable content for the audience associated with the industry or business you're in. Afterwards, post the content on your blog, share it on social media networks and respond to customers' comments and feedback promptly. This will show your clients the extent to which you're concerned about their satisfaction and responsive to their needs.

2.Improve your connectivity:

A website will facilitate things like expanding your reach and attracting more visitors to your business. Planning to make a responsive website design for your site will help make it accessible to an extensive range of users spanning several devices, such as tablets or smartphones. This will increase both your site's exposure and organic traffic.

3.Prove your reliability:

A website offers a straightforward method of showing the credibility of a business, and the way a person represents his business online is vital for attracting more customers or visitors. Therefore, your website design should be handled in the best possible way, because a professional presentation speaks volumes as testimony to your business. With the help of website development, you can add your skills, credentials, experience, expertise and more in a single place. These details help you earn the trust and confidence of your visitors and serve as a reference point for customers interested in your business, making it easy for you to produce leads.

To sum up, it's pretty clear that website development plays a big role in successful business marketing. Without it, it would be very difficult to leave your mark on a global level.

3.2 Web development tools

Web development tools allow web developers to test and debug their code. They are different from website builders and integrated development environments (IDEs) in that they do not assist in the direct creation of a webpage, rather they are tools used for testing the user interface of a website or web application.

Web development tools come as browser add-ons or built-in features in web browsers. Most popular web browsers, such as Google Chrome, Firefox, Internet Explorer, Safari and Opera, have built-in tools to help web developers, and many additional add-ons can be found in their respective plugin download centers.

Web development tools allow developers to work with a variety of web technologies, including HTML, CSS, the DOM, JavaScript, and other components that are handled by the web browser. Due to increasing demand from web browsers to do more, popular web browsers have included more features geared for developers.

3.3 Most used features

The built-in web developer tools in the browser are commonly accessed by hovering over an item on a webpage and selecting the "Inspect Element" or similar option from the context menu. Alternatively the F12 key tends to be another common shortcut.

- **HTML and the DOM**
- HTML and DOM viewer and editor is commonly included in the built-in web development tools. The difference between the HTML and DOM viewer, and the view source feature in web browsers is that the HTML and DOM viewer allows you to see the DOM as it was rendered in addition to allowing you to make changes to the HTML and DOM and see the change reflected in the page after the change is made.
- In addition to selecting and editing, the HTML elements panels will usually also display properties of the DOM object, such as display dimension, and CSS properties.

- **Web page assets, resources and network information**
- Web pages typically load and require additional content in the form of images, scripts, font and other external files. Web development tools also allow developers to inspect resources that are loaded and available on the web page in a tree-structure listing.
- Web development tools also allow developers to view information about the network usage, such as viewing what the loading time and bandwidth usage are and which HTTP headers are being sent and received.

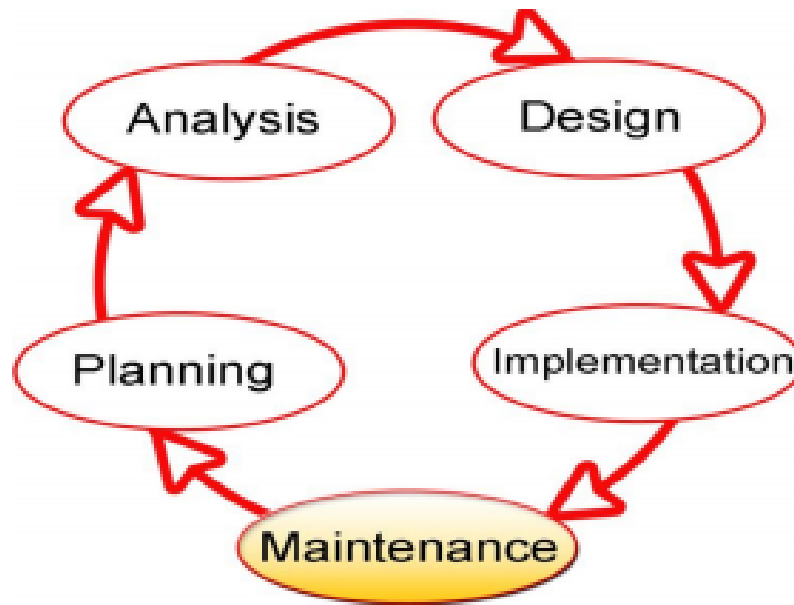
- **Profiling and auditing**
- Profiling allows developers to capture information about the performance of a web page or web application. With this information developers can improve the performance of their scripts. Auditing features may provide developers suggestions, after analyzing a page, for optimizations to decrease page load time and increase responsiveness. Web development tools typically also provide a timeline features provides a record of the time it takes to render the page, memory usage, and the types of events which are taking place.
- These features allow developers to optimize their web page or web application.

- **Javascript debugging**
- JavaScript is commonly used in web browsers. Web development tools commonly include a panel to debug scripts by allowing developers to add watch expressions, breakpoints, view the call stack, and pause, step over, step into, and step out of functions while debugging JavaScript.
- A JavaScript console is commonly included. The consoles allow developers to type in JavaScript commands and call functions, or view errors that may have been encountered during the execution of a script.

3.4 Systems development life cycle

A systems development life cycle is composed of a number of clearly defined and distinct work phases which are used by systems engineers and systems developers to plan for, design, build, test, and deliver information systems. Like anything that is manufactured on an assembly line, an SDLC aims to produce high-quality systems that meet or exceed customer expectations, based on customer requirements, by delivering systems which move through each clearly defined phase, within scheduled time frames and cost estimates. Computer systems are complex and often (especially with the recent rise of service-oriented architecture) link multiple traditional systems potentially supplied by different software vendors. To manage this level of complexity, a number of SDLC models or methodologies have been created, such as waterfall, spiral, Agile software development, rapid prototyping, incremental, and synchronize and stabilize.

SDLC can be described along a spectrum of agile to iterative to sequential methodologies. Agile methodologies, such as XP and Scrum, focus on lightweight processes which allow for rapid changes (without necessarily following the pattern of SDLC approach) along the development cycle. Iterative methodologies, such as Rational Unified Process and dynamic systems development method, focus on limited project scope and expanding or improving products by multiple iterations. Sequential or big-design-up-front (BDUF) models, such as waterfall, focus on complete and correct planning to guide large projects and risks to successful and predictable results. Other models, such as anamorphic development, tend to focus on a form of development that is guided by project scope and adaptive iterations of feature development.



The SDLC is not a methodology per se, but rather a description of the phases in the life cycle of a software application. These phases (broadly speaking) are, investigation, analysis, design, build, test, implement, and maintenance and support. All software development methodologies (such as the more commonly known waterfall and scrum methodologies) follow the SDLC phases but the method of doing that varies vastly between methodologies. In the Scrum methodology, for example, one could say a single user story goes through all the phases of the SDLC within a single two-week sprint. Contrast this to the waterfall methodology, as another example, where every business requirement (recorded in the analysis phase of the SDLC in a document called the Business Requirements Specification) is translated into feature/functional descriptions (recorded in the design phase in a document called the Functional Specification) which are then all built in one go as a collection of solution features typically over a period of three to nine months, or more. These methodologies are obviously quite different approaches yet, they both contain the SDLC phases in which a requirement is born, then travels through the life cycle phases ending in the final phase of maintenance and support, after-which (typically) the whole life cycle starts again for a subsequent version of the software application.

3.5 HTML



Hypertext Markup Language (HTML) is the standard markup language for creating web pages and web applications. With Cascading Style Sheets (CSS) and JavaScript, it forms a triad of cornerstone technologies for the World Wide Web.

Web browsers receive HTML documents from a web server or from local storage and render the documents into multimedia web pages. HTML describes the structure of a web page semantically and originally included cues for the appearance of the document.

HTML elements are the building blocks of HTML pages. With HTML constructs, images and other objects such as interactive forms may be embedded into the rendered page. HTML provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists, links, quotes and other items. HTML elements are delineated by tags, written using angle brackets. Tags such as `` and `<input />` directly introduce content into the page. Other tags such as `<p>` surround and provide information about document text and may include other tags as sub-elements. Browsers do not display the HTML tags, but use them to interpret the content of the page.

What are HTML tags?

- HTML tags are used to mark-up HTML elements
- HTML tags are surrounded by the two characters `<` and `>`
- The surrounding characters are called angle brackets.
- HTML tags normally come in pairs like `` and ``
- The first tag in a pair is the start tag, the second tag is the end tag
- The text between the start and end tags is the element content
- HTML tags are not case sensitive, `` means the same as ``

- Logical vs. Physical Tags

In HTML there are both logical tags and physical tags. Logical tags are designed to describe (to the browser) the enclosed text's meaning. An example of a logical tag is the `` `` tag. By placing text in between these tags you are telling the browser that the text has some greater importance. By default all browsers make the text appear bold when in between the `` and `` tags.

Physical tags on the other hand provide specific instructions on how to display the text they enclose. Examples of physical tags include:

``: Makes the text bold.

`<big>`: Makes the text usually one size bigger than what's around it.

`<i>`: Makes text italic. .

Tag Attributes

Tags can have attributes. Attributes can provide additional information about the HTML elements on your page. The `<tag>` tells the browser to do something, while the attribute tells the browser how to do it. For instance, if we add the `bgcolor` attribute, we can tell the browser that the background color of your page should be blue, like this: `<body bgcolor="blue">`.

This tag defines an HTML table: `<table>`. With an added `border` attribute, you can tell the browser that the table should have no borders: `<table border="0">`. Attributes always come in name/value pairs like this: `name="value"`. Attributes are always added to the start tag of an HTML element and the value is surrounded by quotes.

Basic HTML Tags

The most important tags in HTML are tags that define headings, paragraphs and line breaks.

Basic HTML Tags

Tag	Description
<html>	Defines an HTML document
<body>	Defines the document's body
<h1> to <h6>	Defines header 1 to header 6
<p>	Defines a paragraph
 	Inserts a single line break
<hr>	Defines a horizontal rule
<!-->	Defines a comment

Logical Tags

Tag	Description
<abbr>	Defines an abbreviation
<acronym>	Defines an acronym
<address>	Defines an address element
<cite>	Defines a <i>citation</i>
<code>	Defines computer code text
<blockquote>	Defines a long quotation
	Defines text
<dfn>	Defines a <i>definition</i> term
	Defines <i>emphasized</i> text
<ins>	Defines inserted text
<kbd>	Defines keyboard text
<pre>	Defines preformatted text
<q>	Defines a short quotation
<samp>	Defines sample computer code
	Defines strong text
<var>	Defines a <i>variable</i>

Physical Tags

Tag	Description
	Defines bold text
<big>	Defines big text
<i>	Defines <i>italic</i> text
<small>	Defines small text
<sup>	Defines ^{superscripted} text
<sub>	Defines _{subscripted} text
<tt>	Defines teletype text
<u>	Deprecated. Use styles instead

HTML Backgrounds

Backgrounds:

The <body> tag has two attributes where you can specify backgrounds. The background can be a color or an image.

Bgcolor:

The bgcolor attribute specifies a background-color for an HTML page. The value of this attribute can be a hexadecimal number, an RGB value, or a color name:

```
<body bgcolor="#000000">
```

```
<body bgcolor="rgb(0,0,0)">
```

```
<body bgcolor="black">
```

The lines above all set the background-color to black.

Background:

The background attribute can also specify a background-image for an HTML page. The value of this attribute is the URL of the image you want to use. If the image is smaller than the browser window, the image will repeat itself until it fills the entire browser window.

```
<body background="clouds.gif">
```

```
<body background="http://profdevtrain.austincc.edu/html/graphics/clouds.gif">
```

3.6 CSS



What is CSS?

Cascading Style Sheets, fondly referred to as CSS, is a simple design language intended to simplify the process of making web pages presentable. CSS handles the look and feel part of a web page. Using CSS, you can control the color of the text, the style of fonts, the spacing between paragraphs, how columns are sized and laid out, what background images or colors are used, as well as a variety of other effects. CSS is easy to learn and understand but it provides a powerful control over the presentation of an HTML document. Most commonly, CSS is combined with the markup languages HTML or XHTML.

Advantages of CSS

- CSS saves time - You can write CSS once and then reuse the same sheet in multiple HTML pages. You can define a style for each HTML element and apply it to as many web pages as you want.
- Pages load faster - If you are using CSS, you do not need to write HTML tag attributes every time. Just write one CSS rule of a tag and apply it to all the occurrences of that tag. So, less code means faster download times.
- Easy maintenance - To make a global change, simply change the style, and all the elements in all the web pages will be updated automatically.
- Superior styles to HTML - CSS has a much wider array of attributes than HTML, so you can give a far better look to your HTML page in comparison to HTML attributes.
- Multiple Device Compatibility - Style sheets allow content to be optimized for more than one type of device. By using the same HTML document, different versions of a website can be presented for handheld devices such as PDAs and cellphones or for printing.
- Global web standards – Now HTML attributes are being deprecated and it is being recommended to use CSS. So it's a good idea to start using CSS in all the HTML pages to make them compatible with future browsers.

Who Creates and Maintains CSS?

CSS is created and maintained through a group of people within the W3C called the CSS Working Group. The CSS Working Group creates documents called specifications. When a specification has been discussed and officially ratified by the W3C members, it becomes a recommendation. These ratified specifications are called recommendations because the W3C has no control over the actual implementation of the language. Independent companies and organizations create that software.

NOTE: The World Wide Web Consortium or W3C is a group that makes recommendations about how the Internet works and how it should evolve.

CSS Versions

Cascading Style Sheets level 1 (CSS1) came out of W3C as a recommendation in December 1996. This version describes the CSS language as well as a simple visual formatting model for all the HTML tags.

A CSS comprises of style rules that are interpreted by the browser and then applied to the corresponding elements in your document. A style rule is made of three parts:

- **Selector:** A selector is an HTML tag at which a style will be applied. This could be any tag like <h1> or <table> etc.
- **Property:** A property is a type of attribute of HTML tag. Put simply, all the HTML attributes are converted into CSS properties. They could be color, border, etc.
- **Value:** Values are assigned to properties. For example, color property can have the value either red or #F1F1F1 etc.

Example: You can define a table border as follows:

```
table{ border : 1px solid #C00; }
```

Here table is a selector and border is a property and the given value 1px solid #C00 is the value of that property.

You can define selectors in various simple ways based on your comfort.

CSS Measurement

Unit	Description	Example
%	Defines a measurement as a percentage relative to another value, typically an enclosing element.	<code>p {font-size: 16pt; line-height: 125%;}</code>
cm	Defines a measurement in centimeters.	<code>div {margin-bottom: 2cm;}</code>
em	A relative measurement for the height of a font in em spaces. Because an em unit is equivalent to the size of a given font, if you assign a font to 12pt, each "em" unit would be 12pt; thus, 2em would be 24pt.	<code>p {letter-spacing: 7em;}</code>
ex	This value defines a measurement relative to a font's x-height. The x-height is determined by the height of the font's lowercase letter x.	<code>p {font-size: 24pt; line-height: 3ex;}</code>
in	Defines a measurement in inches.	<code>p {word-spacing: .15in;}</code>
mm	Defines a measurement in millimeters.	<code>p {word-spacing: 15mm;}</code>

3.7 BOOTSTRAP



What is Bootstrap?

Bootstrap is a sleek, intuitive, and powerful, mobile first front-end framework for faster and easier web development. It uses HTML, CSS, and Javascript. Bootstrap was developed by Mark Otto and Jacob Thornton at Twitter. It was released as an open source product in August 2011 on GitHub.

Why Use Bootstrap?

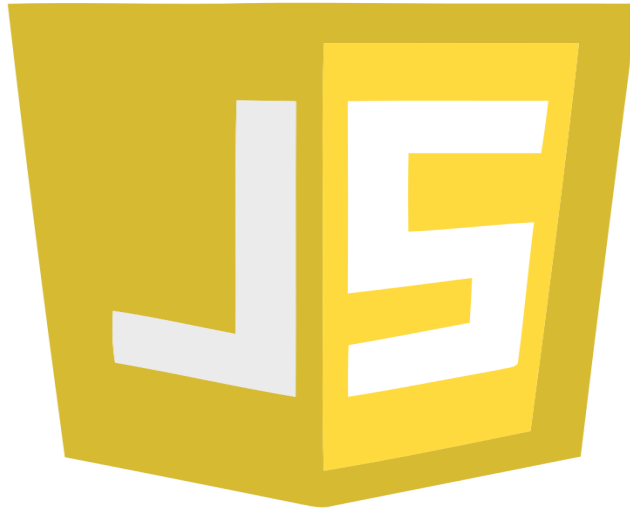
- **Mobile first approach:** Bootstrap 3 framework consists of Mobile first styles throughout the entire library instead of them in separate files.
- **Browser Support:** It is supported by all popular browsers.
- **Easy to get started:** With just the knowledge of HTML and CSS anyone can get started with Bootstrap. Also the Bootstrap official site has a good documentation.
- **Responsive Design:** Bootstrap's responsive CSS adjusts to Desktops, Tablets and Mobiles. Provides a clean and uniform solution for building an interface for developers. It contains beautiful and functional built-in components which are easy to customize also provides web-based customization. And best of all it is an open source.

Basic Structure

- **CSS:** Bootstrap comes with the feature of global CSS settings, fundamental HTML elements styled and enhanced with extensible classes, and an advanced grid system. This is covered in detail in the section Bootstrap with CSS.
- **Components:** Bootstrap contains over a dozen reusable components built to provide iconography, dropdowns, navigation, alerts, pop-overs, and much more. This is covered in detail in the section Layout Components.
- **JavaScript Plugins:** Bootstrap contains over a dozen custom jQuery plugins. You can easily include them all, or one by one. This is covered in details in the section Bootstrap Plugins.
- **Customize:** You can customize Bootstrap's components, LESS variables, and jQuery plugins to get your very own version.

3.8 JAVASCRIPT

JavaScript



What is JavaScript?

JavaScript is a dynamic computer programming language. It is lightweight and most commonly used as a part of web pages, whose implementations allow client-side script to interact with the user and make dynamic pages. It is an interpreted programming language with object-oriented capabilities. JavaScript was first known as LiveScript, but Netscape changed its name to JavaScript, possibly because of the excitement being generated by Java. JavaScript made its first appearance in Netscape 2.0 in 1995 with the name LiveScript. The general-purpose core of the language has been embedded in Netscape, Internet Explorer, and other web browsers. The ECMA-262 Specification defined a standard version of the core JavaScript language.

- JavaScript is a lightweight, interpreted programming language.
- Designed for creating network-centric applications.

The JavaScript code is executed when the user submits the form, and only if all the entries are valid, they would be submitted to the Web Server. JavaScript can be used to trap user initiated events such as button clicks, link navigation, and other actions that the user initiates explicitly or implicitly.

Advantages of JavaScript

The merits of using JavaScript are:

- **Less server interaction:** You can validate user input before sending the page off to the server. This saves server traffic, which means less load on your server.
- **Immediate feedback to the visitors:** They don't have to wait for a page reload to see if they have forgotten to enter something.
- **Increased interactivity:** You can create interfaces that react when the user hovers over them with a mouse or activates them via the keyboard.
- **Richer interfaces:** You can use JavaScript to include such items as drag-and-drop components and sliders to give a Rich Interface to your site visitors.

Limitations of JavaScript

We cannot treat JavaScript as a full-fledged programming language. It lacks the following important features:

- Client-side JavaScript does not allow the reading or writing of files. This has been kept for security reason.
- JavaScript cannot be used for networking applications because there is no such support available.
- JavaScript doesn't have any multithreading or multiprocessor capabilities.

Once again, JavaScript is a lightweight, interpreted programming language that allows you to build interactivity into otherwise static HTML pages.

JavaScript Development Tools

One of major strengths of JavaScript is that it does not require expensive development tools. You can start with a simple text editor such as Notepad. Since it is an interpreted language inside the context of a web browser, you don't even need to buy a compiler. To make our life simpler, various vendors have come up with very nice JavaScript editing tools. Some of them are listed here:

- **Microsoft FrontPage:** Microsoft has developed a popular HTML editor called FrontPage. FrontPage also provides web developers with a number of JavaScript tools to assist in the creation of interactive websites.
- **Macromedia Dreamweaver MX:** Macromedia Dreamweaver MX is a very popular HTML and JavaScript editor in the professional web development crowd. It provides several handy prebuilt JavaScript components, integrates well with databases, and conforms to new standards such as XHTML and XML.
- **Macromedia HomeSite 5:** HomeSite 5 is a well-liked HTML and JavaScript editor from Macromedia that can be used to manage personal websites effectively.

Where is JavaScript Today?

The ECMAScript Edition 5 standard will be the first update to be released in over four years. JavaScript 2.0 conforms to Edition 5 of the ECMAScript standard, and the difference between the two is extremely minor. The specification for JavaScript 2.0 can be found on the following site:
<http://www.ecmascript.org/>

Today, Netscape's JavaScript and Microsoft's JScript conform to the ECMAScript standard, although both the languages still support the features that are not a part of the standard. JavaScript can be implemented using JavaScript statements that are placed within the `<script>... </script>` HTML tags in a web page. You can place the `<script>` tags, containing your JavaScript, anywhere within your web page, but it is normally recommended that you should keep it within the `<head>` tags.

The <script> tag alerts the browser program to start interpreting all the text between these tags as a script. A simple syntax of your JavaScript will appear as follows.

```
<script ...>
```

JavaScript code

```
</script>
```

The script tag takes two important attributes:

- **Language:** This attribute specifies what scripting language you are using. Typically, its value will be javascript. Although recent versions of HTML (and XHTML, its successor) have phased out the use of this attribute.
- **Type:** This attribute is what is now recommended to indicate the scripting language in use and its value should be set to "text/javascript". So your JavaScript syntax will look as follows.

```
<script language="javascript" type="text/javascript">
```

JavaScript code

```
</script>
```

Case Sensitivity

JavaScript is a case-sensitive language. This means that the language keywords, variables, function names, and any other identifiers must always be typed with a consistent capitalization of letters. So the identifiers Time and TIME will convey different meanings in JavaScript.

NOTE: Care should be taken while writing variable and function names in JavaScript.

Comments in JavaScript

JavaScript supports both C-style and C++-style comments. Thus:

- Any text between a // and the end of a line is treated as a comment and is ignored by JavaScript.
- Any text between the characters /* and */ is treated as a comment. This may span multiple lines.

- JavaScript also recognizes the HTML comment opening sequence `<!--`. JavaScript treats this as a single-line comment, just as it does the `//` comment.
- The HTML comment closing sequence `-->` is not recognized by JavaScript so it should be written as `//-->`.

JavaScript Data types

One of the most fundamental characteristics of a programming language is the set of data types it supports. These are the type of values that can be represented and manipulated in a programming language.

JavaScript allows you to work with three primitive data types:

- Numbers, e.g., 123, 120.50 etc.
- Strings of text, e.g. "This text string" etc.
- Boolean, e.g. true or false.

JavaScript also defines two trivial data types, null and undefined, each of which defines only a single value. In addition to these primitive data types, JavaScript supports a composite data type known as object.

Note: Java does not make a distinction between integer values and floating-point values. All numbers in JavaScript are represented as floating-point values. JavaScript represents numbers using the 64-bit floating-point format defined by the IEEE 754 standard.

JavaScript Variables

Like many other programming languages, JavaScript has variables. Variables can be thought of as named containers. You can place data into these containers and then refer to the data simply by naming the container. Before you use a variable in a JavaScript program, you must declare it. Storing a value in a variable is called variable initialization. You can do variable initialization at the time of variable creation or at a later point in time when you need that variable.

Note: Use the var keyword only for declaration or initialization, once for the life of any variable name in a document. You should not re-declare same variable twice. JavaScript is untyped language. This means that a JavaScript variable can hold a value of any data type. Unlike many other languages, you don't have to tell JavaScript during variable declaration what type of value the variable will hold. The value type of a variable can change during the execution of a program and JavaScript takes care of it automatically.

JavaScript Variable Scope

The scope of a variable is the region of your program in which it is defined. JavaScript variables have only two scopes.

- **Global Variables:** A global variable has global scope which means it can be defined anywhere in your JavaScript code.
- **Local Variables:** A local variable will be visible only within a function where it is defined. Function parameters are always local to that function.

Within the body of a function, a local variable takes precedence over a global variable with the same name. If you declare a local variable or function parameter with the same name as a global variable, you effectively hide the global variable.

JavaScript Reserved Words

A list of all the reserved words in JavaScript are given in the following table.

They cannot be used as JavaScript variables, functions, methods, loop labels, or any object names.

abstract	else	Instanceof	switch
boolean	enum	int	synchronized
break	export	interface	this
byte	extends	long	throw
case	false	native	throws
catch	final	new	transient
char	finally	null	true
class	float	package	try
const	for	private	typeof
continue	function	protected	var
debugger	goto	public	void
default	if	return	volatile
delete	implements	short	while
do	import	static	with
double	in	super	

What is an Operator?

Let us take a simple expression $4 + 5$ is equal to 9. Here 4 and 5 are called operands and '+' is called the operator. JavaScript supports the following types of operators.

- Arithmetic Operators
- Comparison Operators
- Logical (or Relational) Operators
- Assignment Operators
- Conditional (or ternary) Operator

3.9 REACT



ReactJS is JavaScript library used for building reusable UI components. According to React official documentation, following is the definition –

React is a library for building composable user interfaces. It encourages the creation of reusable UI components, which present data that changes over time. Lots of people use React as the V in MVC. React abstracts away the DOM from you, offering a simpler programming model and better performance. React can also render on the server using Node, and it can power native apps using React Native. React implements one-way reactive data flow, which reduces the boilerplate and is easier to reason about than traditional data binding.

3.9.2 React – Features

- **JSX** – JSX is JavaScript syntax extension. It isn't necessary to use JSX in React development, but it is recommended.
- **Components** – React is all about components. You need to think of everything as a component. This will help you maintain the code when working on larger scale projects.
- **Unidirectional data flow and Flux** – React implements one-way data flow which makes it easy to reason about your app. Flux is a pattern that helps keeping your data unidirectional.
- **License** – React is licensed under Facebook Inc. Documentation is licensed under CC BY 4.0.

3.9.3 React — Advantages

- Uses virtual DOM which is a JavaScript object. This will improve apps performance, since JavaScript virtual DOM is faster than the regular DOM.
- Can be used on client and server side as well as with other frameworks.
- Components and data patterns improve readability, which helps to maintain larger apps.

3.9.4 React — Limitations

- Covers only the view layer of the app, hence you still need to choose other technologies to get a complete tooling set for development.
- Uses inline templating and JSX, which might seem awkward to some developers.

3.10 GIT

Advantages of Git

- **Free and open source:** Git is released under GPL's open source license. It is available freely over the internet. You can use Git to manage propriety projects without paying a single penny. As it is an open source, you can download its source code and also perform changes according to your requirements.
- **Fast and small:** As most of the operations are performed locally, it gives a huge benefit in terms of speed. Git does not rely on the central server; that is why, there is no need to interact with the remote server for every operation performed. The core part of Git is written in C, which avoids runtime overheads associated with other high level languages. Though Git mirrors entire repository, the size of the data on the client side is small. This illustrates the efficiency of Git at compressing and storing data on the client side.
- **Implicit backup:** The chances of losing data are very rare when there are multiple copies of it. Data present on any client side mirrors the repository, hence it can be used in the event of a crash or disk corruption.
- **Security:** Git uses a common cryptographic hash function called secure hash function (SHA1), to name and identify objects within its database. Every file and commit is check-summed and retrieved by its checksum at the time of checkout. It implies that it is impossible to change file, date, and commit message and any other data from the Git database without knowing Git.

VCS Terminologies

Local Repository

Every VCS tool provides a private workplace as a working copy. Developers make changes in their private workplace and after commit, these changes become a part of the repository. Git takes it one step further by providing them a private copy of the whole repository. Users can perform many operations with this repository such as add file, remove file, rename file, move file, commit changes, and many more.

Working Directory and Staging Area or Index

The working directory is the place where files are checked out. In other CVCS, developers generally make modifications and commit their changes directly to the repository. But Git uses a different strategy. Git doesn't track each and every modified file. Whenever you do commit an operation, Git looks for the files present in the staging area. Only those files present in the staging area are considered for commit and not all the modified files.

Blobs

Blob stands for Binary Large Object. Each version of a file is represented by blob. A blob holds the file data but doesn't contain any metadata about the file. It is a binary file and in Git database, it is named as SHA1 hash of that file. In Git, files are not addressed by names. Everything is content-addressed.

Trees

Tree is an object, which represents a directory. It holds blobs as well as other sub-directories. A tree is a binary file that stores references to blobs and trees which are also named as SHA1 hash of the tree object.

Commits

Commit holds the current state of the repository. A commit is also named by SHA1 hash. You can consider a commit object as a node of the linked list. Every commit object has a pointer to the parent commit object. From a given commit, you can traverse back by looking at the parent pointer to view the history of the commit. If a commit has multiple parent commits, then that particular commit has been created by merging two branches.

Branches

Branches are used to create another line of development. By default, Git has a master branch, which is same as trunk in Subversion. Usually, a branch is created to work on a new feature. Once the feature is completed, it is merged back with the master branch and we delete the branch.

Tags

Tag assigns a meaningful name with a specific version in the repository. Tags are very similar to branches, but the difference is that tags are immutable. It means, tag is a branch, which nobody intends to modify. Once a tag is created for a particular commit, even if you create a new commit, it will not be updated. Usually, developers create tags for product releases.

Clone

Clone operation creates the instance of the repository. Clone operation not only checks out the working copy, but it also mirrors the complete repository. Users can perform many operations with this local repository. The only time networking gets involved is when the repository instances are being synchronized.

Pull

Pull operation copies the changes from a remote repository instance to a local one. The pull operation is used for synchronization between two repository instances. This is same as the update operation in Subversion.

Push

Push operation copies changes from a local repository instance to a remote one. This is used to store the changes permanently into the Git repository. This is same as the commit operation in Subversion.

3.11 NODE JS :



3.11 What is Node.js?

Node.js is a server-side platform built on Google Chrome's JavaScript Engine (V8 Engine). Node.js was developed by Ryan Dahl in 2009 and its latest version is v0.10.36. The definition of Node.js as supplied by its official documentation is as follows:

Node.js is a platform built on Chrome's JavaScript runtime for easily building fast and scalable network applications. Node.js uses an event-driven, non-blocking I/O model that makes it lightweight and efficient, perfect for data-intensive real-time applications that run across distributed devices.

Node.js is an open source, cross-platform runtime environment for developing server-side and networking applications. Node.js applications are written in JavaScript, and can be run within the Node.js runtime on OS X, Microsoft Windows, and Linux. Node.js also provides a rich library of various JavaScript modules which simplifies the development of web applications using Node.js to a great extent.

Node.js = Runtime Environment + JavaScript Library

Features of Node.js

Following are some of the important features that make Node.js the first choice of software architects.

- **Asynchronous and Event Driven** – All APIs of Node.js library are asynchronous, that is, non-blocking. It essentially means a Node.js based server never waits for an API to return data. The server moves to the next API after calling it and a notification mechanism of Events of Node.js helps the server to get a response from the previous
- **No Buffering** – Node.js applications never buffer any data. These applications simply output the data in chunks.
- **License** – Node.js is released under the MIT license.

Who Uses Node.js?

Following is the link on github wiki containing an exhaustive list of projects, application and companies which are using Node.js. This list includes eBay, General Electric, GoDaddy, Microsoft, PayPal, Uber, Wikipins, Yahoo!, and Yammer to name a few.

Projects, Applications, and Companies Using Node

4.11.1 Concepts

The following diagram depicts some important parts of Node.js which we will discuss in detail in the subsequent chapters.



4.11.3 Where to Use Node.js?

Following are the areas where Node.js is proving itself as a perfect technology xpartner.

- I/O bound Applications
- Data Streaming Applications
- Data Intensive Real-time Applications (DIRT)
- JSON APIs based Applications
- Single Page Applications

4.11.3 Where Not to Use Node.js?

It is not advisable to use Node.js for CPU intensive application

3.12 EXPRESS JS



Express provides a minimal interface to build our applications. It provides us the tools that are required to build our app. It is flexible as there are numerous modules available on npm, which can be directly plugged into Express. Express was developed by TJ Holowaychuk and is maintained by the Node.js foundation and numerous open source contributors.

Why Express?

Unlike its competitors like Rails and Django, which have an opinionated way of building applications, Express has no "best way" to do something. It is very flexible and pluggable.

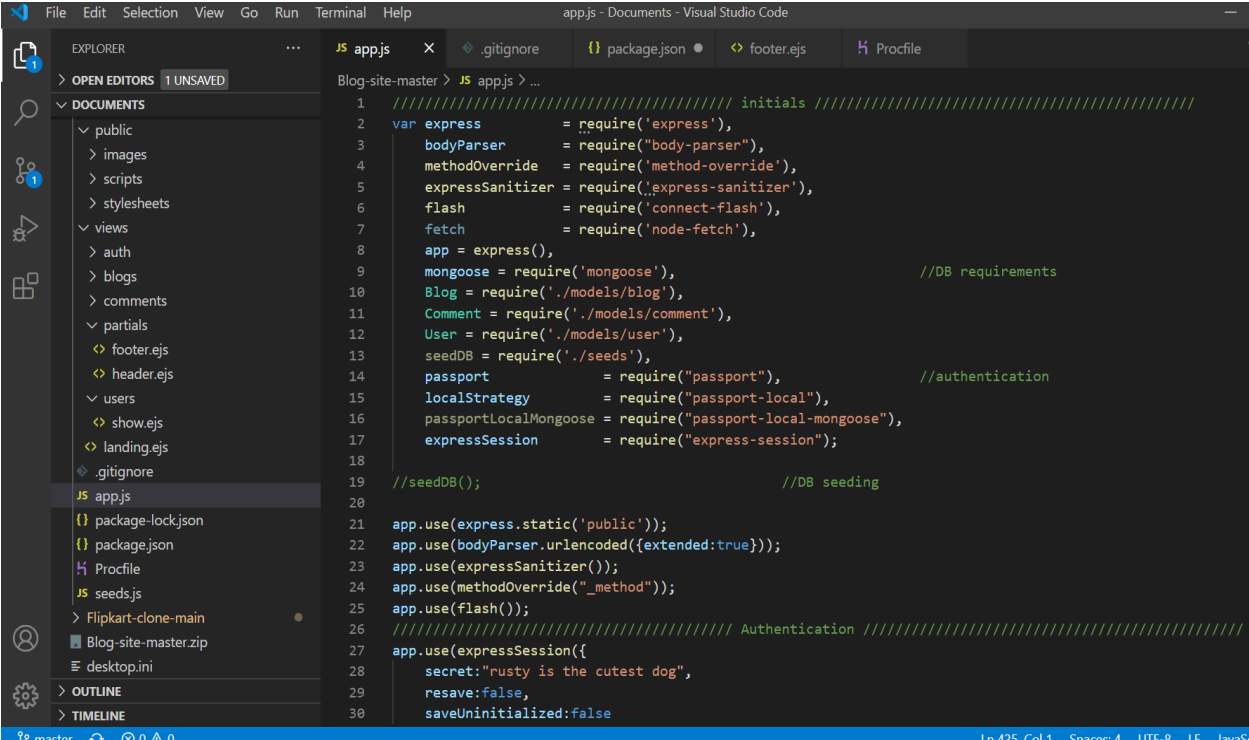
3.13 BLOG SITE PROJECT (YelpCamp)

Technical Components used: HTML5, CSS, Bootstrap 4, Javascript (ES6), Git + Github.

Description

The BLOG-SITE is a simple project developed using JavaScript, CSS, and HTML, NODE-JS, EXPRESS-JS. This site is an interesting site, where users can create their own post, view and comment on other's post. On this app, you can compare different posts and decide what is best for you.

3.13.2 OUTPUT SCREENSHOT



The screenshot shows the Visual Studio Code editor with a project named 'Blog-site-master' open. The Explorer panel on the left shows the file structure, including folders like 'public', 'views', and 'users', and files like 'app.js', 'package.json', 'seeds.js', and 'desktop.ini'. The main editor area displays the content of 'app.js', which is a JavaScript file for an Express.js application. The code includes imports for various modules like 'express', 'body-parser', 'method-override', 'express-sanitizer', 'connect-flash', 'node-fetch', 'mongoose', 'passport', 'passport-local', 'passport-local-mongoose', and 'express-session'. It also includes database seeding and authentication setup. The code is as follows:

```
1 ////////////////////////////////////////////////// initials //////////////////////////////////////
2 var express = require('express'),
3     bodyParser = require('body-parser'),
4     methodOverride = require('method-override'),
5     expressSanitizer = require('express-sanitizer'),
6     flash = require('connect-flash'),
7     fetch = require('node-fetch'),
8     app = express(),
9     mongoose = require('mongoose'), //DB requirements
10     Blog = require('./models/blog'),
11     Comment = require('./models/comment'),
12     User = require('./models/user'),
13     seedDB = require('./seeds'),
14     passport = require("passport"), //authentication
15     localStrategy = require("passport-local"),
16     passportLocalMongoose = require("passport-local-mongoose"),
17     expressSession = require("express-session");
18
19 //seedDB(); //DB seeding
20
21 app.use(express.static('public'));
22 app.use(bodyParser.urlencoded({extended:true}));
23 app.use(expressSanitizer());
24 app.use(methodOverride("_method"));
25 app.use(flash());
26 ////////////////////////////////////////////////// Authentication //////////////////////////////////////
27 app.use(expressSession({
28     secret:"rusty is the cutest dog",
29     resave:false,
30     saveUninitialized:false
```

```
1 <%- include("../partials/header") %>
2
3 <div class="container py-4">
4   <h1 class="display-5">
5     Login
6   </h1>
7   <div class="border p-4 mt-4">
8     <form action="/login" method="POST">
9       <div class="form-group">
10        <input type="email" class="form-control" name="username" placeholder="Usern
11      </div>
12      <div class="form-group">
13        <input type="password" class="form-control" name="password" placeholder="Pa
14      </div>
15      <button type="submit" class="btn btn-primary">Login</button>
16    </form>
17  </div>
18  <a href="/blogs" class="btn btn-success">Back</a>
19 </div>
20
21 <%- include("../partials/footer") %>
```

```
1 <%- include("../partials/header") %>
2
3 <div class="container py-4">
4   <h1 class="display-5">
5     Sign Up
6   </h1>
7   <div class="border p-4 mt-4">
8     <form action="/register" method="POST">
9       <div class="form-group">
10        <input type="text" class="form-control" name="name" placeholder="Full Name" required>
11      </div>
12      <div class="form-group">
13        <input type="email" class="form-control" name="username" placeholder="Username" required>
14      </div>
15      <div class="form-group">
16        <input type="password" class="form-control" name="password" placeholder="Password" require
17      </div>
18      <button type="submit" class="btn btn-primary">Sign Up</button>
19    </form>
20  </div>
21  <a href="/blogs" class="btn btn-success">Back</a>
22 </div>
23
24 <%- include("../partials/footer") %>
```

```
1 <%- include("../partials/header") %>
2
3 <div class="container py-4">
4   <h1 class="display-5">
5     Create Comment on <%=blog.title%>
6   </h1>
7   <div class="border p-4 mt-4">
8     <form action="/blogs/<%=blog._id%>/comments" method="POST">
9       <div class="form-group">
10         <input type="text" class="form-control" name="comment[text]" placeholder="
11       </div>
12       <button type="submit" class="btn btn-primary">Submit</button>
13     </form>
14   </div>
15   <a href="/blogs/<%=blog._id%>" class="btn btn-success">Back</a>
16 </div>
17
18 <%- include("../partials/footer") %>
```

← → ↺ ⓘ localhost:99/blogs/new ☆ ⚙️ 🔍 ⌵

BlogAdda My Profile ▾

Create A New Blog

Title

Image

Content

Submit

Sign Up

Sign Up

Back

localhost:5577/blogs



Chapter 4

Findings and Suggestions

Keeping up with the ever changing web development changes is getting on the nerves for many. While some of the changes are temporary and short lived, many of the others have a dramatic change prevailing the notions.

For example, Flash took the web development ethics to entirely a new horizon when it was initially introduced. But today, it's just a design option.

While traditional web developers might see themselves getting out of fashion, the upcoming trends in web development will certainly bring in a new revolution. The following trends are worth our attention and how they are going to change the face of traditional web designs.

1. UI Animation

UI animations, or commonly referred as motion UI, is a SaaS library that's used in custom CSS. Although responsive web designs have been making around for quite some time, what everyone expects in the near future is something larger than just responsive.

UI animation allows web developers to create a more interactive, animated and unique transitional design that adds value to your website. The technology is busy finding newer methods to implement motion UI in a more easy and efficient manner.

2. PHP 7

PHP, has far by now remained the most preferred language for backend of web development. The language has improved a lot more than anyone can imagine with its latest release of version 7.0. It is recognised as one of the latest trends for web development in 2018.

The Laravel 5.x, the framework used in PHP 7, offers you with ready solutions that make working with complex tasks a lot more easier than before. The open-source framework has a large online community, making you worry less for any problems with your web app.

3. Virtual reality WordPress site

We have already placed our foot in the world of Virtual reality(VR), which always fascinated us with its research, and the same is seen in the case of web development methodologies. VR changes the way we communicate and interact with the technology world.

Implementing VR to the world of web development demands support from a huge library. E Commerce websites have already enabled their customers to interact with the products and create an all new experience for them. With WordPress bringing in support for VR content in their sites, we expect to see widespread use of VR in web design.

4. Card Designs

Use of card based designs, a fundamental material principle from Google, is a piece of content which includes a text, image or video, is broken down into separate cards which allows a user to navigate through a site. The UI cards can show a larger amount of data just on a piece of card.

Also, the UI cards also blend well with mobile responsive designs and works best on tablets and various browsers. Cards also allow businesses to build robust systems which develop and organises data, which includes various filters and sorting options, to cater to specific needs of users.

5. Automated Coding

Believe us, automated coding, which is based on the principles of artificial intelligence can do wonders to developing your web strategy. Due to the much talked hyped about AI in web development field, many companies have now launch a DIY website builder, which builds you website with just a few inputs from you. Doesn't that sound interesting!

But many of the researchers say that using AI in the field of web development can prove threat to developers. But that is not proved yet. Do you think artificial intelligence and automated coding can replace the human intelligence and design?

6. SaaS

Creating a code free website with the help of tools has become a trend nowadays. Companies offering these tools promise a breath-taking user experience that doesn't require you to know coding and programming. You may only require to know a few basics of photo shop or any photo editor.

SaaS is a cloud based subscription model entity that can access your data via any browser. Instead of downloading a product, installing it on your machine and then running the program, you just visit a SaaS site through your browser and access the product with their login details.

7. Conversational E-Commerce

Popularly known as Chat-Bots, these are computer programs that work like humans with the help of machine learning and natural language processing (NLP). They can communicate with the customer; get the message across giving illusion to the customer of being a human being. Chat-bots are widely used in E-commerce applications.

The Bot revolution has already taken the place of humans and only time can tell how far it's going to take this trend. Lots of conferences and research papers are going deeper into the evolution of chat bots.

Conclusion

As long as the web lives, new trends will come and go. Seeing the current trend, web developers need to look ahead and redirect their approach with new business ideas. The need to re-invent you will continue, especially for small enterprises. All the web development trends above are going to help you stay competitive in the market work wonders.

Chapter 5

Conclusion

As web developers, we are constantly trying to address the problem of inconsistencies between the renderings of web pages by different browsers and browser version. This necessitates either time-consuming double/multiple coding, or coding for a single browser which makes it harder, if not representatives of the same people who use those- browser makers, web developers, content providers, and other organizations.

Writing web pages in accordance with the standards shortens site development time and makes page easier to maintain. Debugging and troubleshooting become easier, because the code follows a standard. No longer do you have to worry about the coding and maintenance for several versions of code that are supposed to accomplish the same presentation.

The universal adoption of web standards is becoming of paramount importance. The mission of The Web Standards Project is to make the Web a better place, for developers and for end-users, by encouraging browser and web page editor makers to follow then standards in their applications. This effort will be greatly helped when web developers use the standards in their applications. This effort will be greatly helped when web developers use the standards as a matter of a course, and insist that generators and renderers of their code comply with the standards.

The reasons that are mentioned above should give web developer, plenty of incentive to begin using standards, and also plenty of ammunition with which we can encourage our place of business and fellow developers to use those standards.

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