

WEB DEVELOPMENT

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CERTIFICATE

This is to certify that the seminar entitled “**WEB DEVELOPMENT**” submitted by **Karthik Suryadevara (18BQ1A0467)**, to JNTU KAKINADA for the partial fulfillment of award of the degree of BACHELOR OF TECHNOLOGY, in Electronics and Communication Engineering of Jawaharlal Nehru Technological University, Kakinada is a record of bonafide work carried out by him/her under my supervision and guidance.

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WEB DEVELOPMENT

Abstract:

The Web is a popular software, used to share/access information or data (text, images, audio, video, mp3..etc) using the internet. It is a popular tool used by the people to interact with the internet. The web has many applications such as booking a hotel or bus ticket, shopping online, social media, education and entertainment.

This report discusses about web development. The report explains the overall process of developing a website/webapp, important terminologies, steps involved in developing and maintaining a website, technologies used in development and finally concludes with steps to take the website/webapp to the web/online.

Chapter 1

Introduction

1.1 What is WEB:

The World Wide Web (WWW), commonly known as the Web, is the world's dominant software platform. It is an information space where documents and other web resources can be accessed through the Internet using a web browser. The Web has changed people's lives immeasurably. It is the primary tool billions of people worldwide use to interact on the Internet.

Web resources may be any type of downloadable media. Web pages are documents interconnected by hypertext links formatted in Hypertext Markup Language (HTML). The HTML syntax displays embedded hyperlinks with URLs, which permits users to navigate to other web resources. In addition to text, web pages may contain references to images, video, audio, and software components, which are either displayed or internally executed in the user's web browser to render pages or streams of multimedia content. Web applications are web pages that function as application software.

Multiple web resources with a common theme and usually a common domain name make up a website. Websites are stored in computers that are running a web server, which is a program that responds to requests made over the Internet from web browsers running on a user's computer. Website content can be provided by a publisher or interactively from user-generated content. Websites are provided for a myriad of informative, entertainment, commercial, and governmental reasons.

The Web was originally conceived as a document management system. The information in the Web is transferred via the Hypertext Transfer Protocol (HTTP) to be accessed by users through software applications

1.2 Uses/Applications of WEB:



Fig 1.1: Uses of Web

Online Booking & Orders

The Internet has made it a lot easier for people to book tickets for buses, trains, flights (domestic and international) directly using their devices from anywhere. People can also book a taxi by choosing their current location, and they will be picked up or dropped at a specified location. Now no one needs to wait in long queues for their turn to book tickets at the ticket counter.

Besides, people can order a wide variety of products at home using the Internet and devices. It can range from grocery products to ready to eat, fashionable clothes

to medicines. Most items can be ordered at home and received directly at the door.

Cashless Transactions

Most countries are promoting cashless transactions and digital payments. This helps people not carry much cash. People can pay their bills through debit or credit cards using POS devices. These devices are connected to the payment gateway on the Internet. Besides, People can also use their smartphone and the Internet for processing transactions on UPI (Unified Payment Interface). It does not even require them to carry their cards. The UPI payment method is continuously evolving and is expected to cover most transactions in the near future.

Education

Most of the devices nowadays are connected through the Internet. The Internet has the availability of broad educational content on any topic with different types. People can study the relevant topic just by spending a couple of minutes over the Internet. Internet Search engines help people quickly find the relevant study

material in multiple formats (such as images, videos, documents, etc.). This helps eliminate the need to go to the library to read several books to find the desired information.

Online Banking & Trading

The way of banking has changed after the introduction of the Internet. The Internet has made banking online where people can manage their bank accounts while sitting at home or traveling abroad. Nowadays, most of the features of banking are right in people's hands. With the help of online banking, people can securely transfer the money from one account to another, change their ATM pins, apply for the physical or virtual credit cards, update credit card limits, enable or disable international transactions, track their transactions, and many more. Also, they can even raise an online complaint or contact to bank's support staff.

Research

The Internet is playing a significant role in the field of research. Before the use of the Internet, it was quite hard to look for information about anything. People

had to go through hundreds of books for references to find the desired information. However, the Internet has made it a lot easier, and anyone can find the required information at some clicks only. In research, people can study about the success and failed research and work further for the improvements. Uses of the Internet in research have incredibly beneficial for the researchers.

Electronic Mail

Email or electronic mail is one of the first significant uses of the Internet. The email has enabled faster communication between people on the Internet. Using email, people can quickly share information, data files, such as images, audio, video, and other types of files. The use of email has significantly reduced paper use, which was the primary source of communication in the olden days. Anyone can have a free email address and can easily communicate with others. This has also reduced the load on the physical mail system, although it is still in use.

Entertainment

The Internet is the most effective means of entertainment. There are various options available on the Internet, which people can try, such as watching movies, playing online games, listening to songs, etc. The Internet has also made it easy for people to download entertainment items to their local storage. Using the Internet, people can also share their videos, songs, pictures online with others. Also, nowadays, people can watch live TV or sports on the Internet.

File Transfer

The Internet has made file transfer between systems or devices easier. With FTP (File Transfer Protocol), data can be securely exchanged over the Internet.

Chapter 2

How to build a website/webapp

2.1 Software development life-cycle (SDLC)

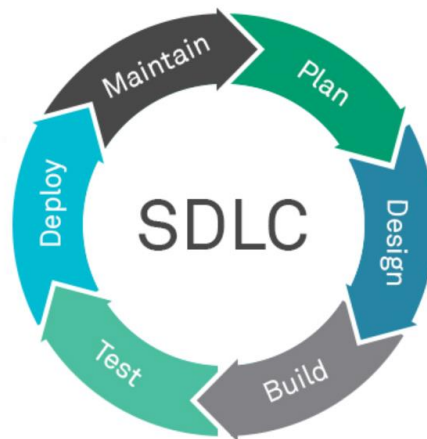


Fig 2.1: Software development Life cycle

SDLC is a process followed for a software project, within a software organization. It consists of a detailed plan describing how to develop, maintain, replace and alter or enhance specific software. The life cycle defines a methodology for improving the quality of software and the overall development process.

2.2 Planning

Requirement analysis is the most important and fundamental stage in SDLC. It is performed by the

senior members of the team with inputs from the customer, the sales department, market surveys and domain experts in the industry. This information is then used to plan the basic project approach and to conduct product feasibility study in the economical, operational and technical areas.

2.3 Design

Defining your site's purpose and strategy

It sounds like such a simple point to make, but before you jump head-first into designing your website, you first need to be clear on its purpose.

Beyond simply knowing your industry and defining a content strategy, you need to think about what your USP (unique selling point) is, and how you want to come across.

Researching the latest web design trends

Web design evolves quickly, but there are some more prevalent trends you can learn from. At this point, it's important to note that just because a web trend is current, it doesn't mean it's necessarily right for you.

48% of people cite design as the most important factor of a website, so it's important to take your time and look at what competitors are doing. Each sector will have different styles, so it's vital you know whether you want to fit into your industry, or disrupt it.

Choosing your platform

The first thing that springs to mind when you think of quality web design is a professional agency, right? And while top companies largely do a great job, they can be eye-wateringly expensive.

Luckily, there is another way: website builders and ecommerce platforms. These are DIY online tools that allow you to create and design your own website – without needing to know a single line of code!

Ex: Figma, AdobeXd

Deciding on your branding

When designing your site, you should think about how everything you do relates to your overall brand.

Everything from the color scheme to font style and

imagery play a part in telling your brand's story. It's important they're all sending the same message.

Adding in and optimizing content

Positioning refers to where your content sits on each page, and how it's laid out. Optimization, meanwhile, is the process of tweaking content to help it rank higher on search engines, such as Google or Bing.

2.4 Develop/Build

There are two phases in developing a website/webapp

- i) Front-End
- ii) Back-End

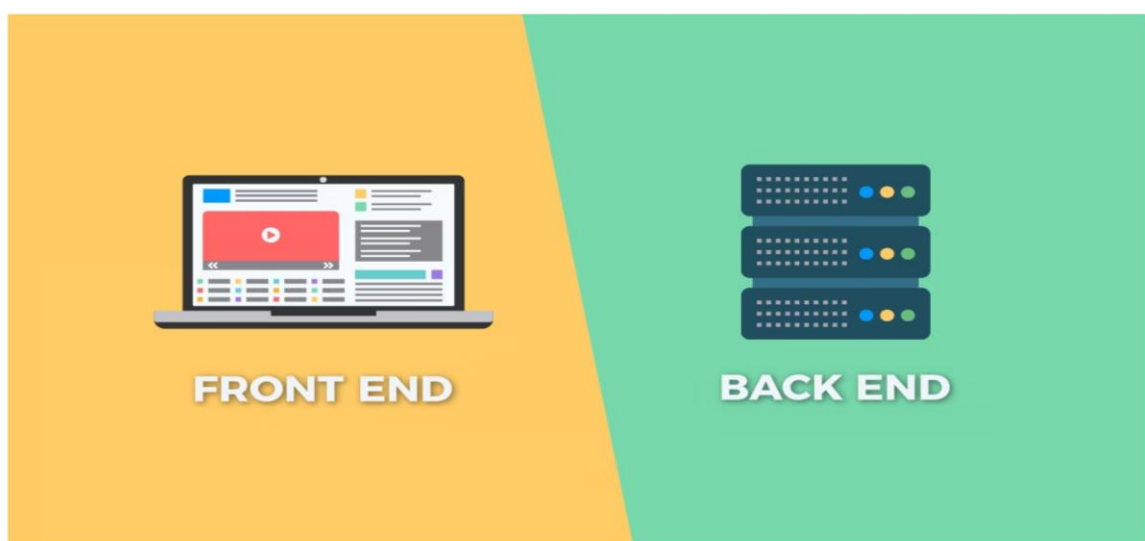


Fig 2.2 Front-End and Back-End

Front-End:



Fig 2.3 Front-End Technologies

Front-end web development is the development of the graphical user interface of a website, through the use of HTML, CSS, and JavaScript, so that users can view and interact with that website.

HyperText Markup Language

HyperText Markup Language (HTML) is the backbone of any website development process, without which a web page does not exist. Hypertext means that text has links, termed hyperlinks, embedded in it. When a user clicks on a word or a phrase that has a hyperlink, it will bring another web-page. A markup language indicates text can be turned into images, tables, links, and other representations. It is the HTML code that provides an overall framework of how the site will look. HTML was developed by Tim Berners-Lee. The latest version of HTML is called HTML5 and was

published on October 28, 2014 by the W3C recommendation. This version contains new and efficient ways of handling elements such as video and audio files.

Cascading Style Sheets (CSS)

Cascading Style Sheets (CSS) controls the presentation aspect of the site and allows your site to have its own unique look. It does this by maintaining style sheets that sit on top of other style rules and are triggered based on other inputs, such as device screen size and resolution. The CSS can be added externally, internally, or embedded in the HTML tags.[2]

JavaScript

JavaScript is an event-based imperative programming language (as opposed to HTML's declarative language model) that is used to transform a static HTML page into a dynamic interface. JavaScript code can use the Document Object Model (DOM), provided by the HTML standard, to manipulate a web page in response to events, like user input.

Using a technique called AJAX, JavaScript code can also actively retrieve content from the web (independent of the original HTML page retrieval), and also react to server-side events as well, adding a truly dynamic nature to the web page experience.

Back-End:



Fig 2.4 Back-End Technologies

Backend Development is also known as server-side development. It is everything that the users don't see and contains behind-the-scenes activities that occur when performing any action on a website. It focuses primarily on databases, backend logic, APIs, and Servers.

The backend of a website is a combination of servers, applications, and databases. Code written by backend developers helps browsers in communicating with the

databases and store data into the database, read data from the database, update the data and delete the data or information from the database.

The Back-End can be written using any programming language and each language has its pros and cons so choosing a right language and framework is important.

Ex: Python & Django, JavaScript & Node.js, Java & Spring

2.5 Testing

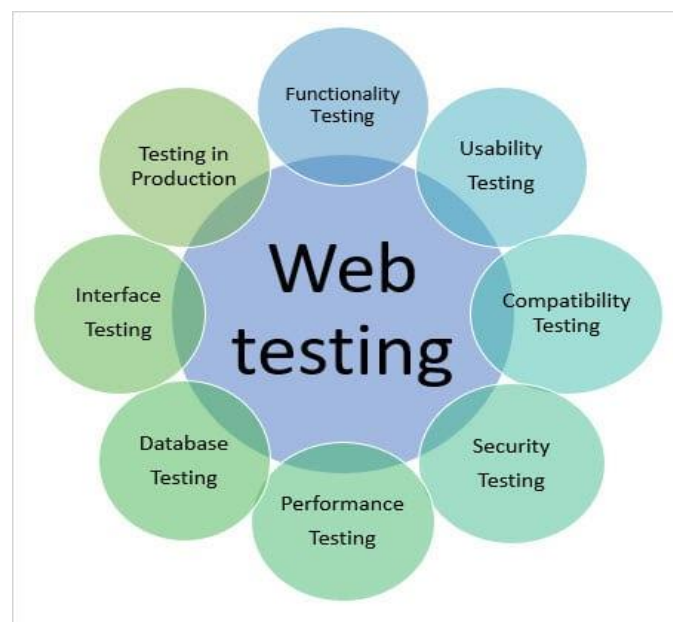


Fig 2.5 Testing

Web testing, or web application testing, is a software practice that ensures quality by testing that the functionality of a given web application is working as

intended or as per the requirements. Web testing allows you to find bugs at any given time, prior to a release, or on a day-to-day basis.

Testing is a highly important part of software development. Whenever there's a change in the code, no matter how small, bugs can appear somewhere else in the system. The cost of fixing these bugs rises the later they are found in the development pipeline. Having effective web testing in place can prevent these additional costs.

How to test web applications

Creating a top-notch web application requires a lot of testing which, if performed manually, can be tedious and time-consuming. For this reason, many QA teams rely on automation to create fast, efficient, and reliable test cases for their web applications.

Test automation offloads these routine and repetitive testing tasks from humans to machines. The tests compare actual outcomes with predicted outcomes. This approach can help find bugs in specific operations and simple-use cases (e.g. logging in, creating a new account, doing password resets).

By automating web application tests, testers are able to save time and effort on monotonous tasks.

Automated tests can be run continuously or scheduled at intervals. This offloads tester from time-consuming tasks, and they can focus on exploratory testing or other tests that require a human perspective.

Test automation is the use of software (separate from the software under test) to control the execution of tests. It lets software robots perform repetitive tasks and emulate end-user interaction with the system under test, in order to increase the range, depth, and reliability of one's quality assurance efforts.

Still, automation is not a plug-and-play system requiring no human intervention. Effective automation requires testers to have a thorough knowledge of the software under test, as well as an "automation first" mindset.

2.6 Deploy

Deployment starts with purchasing a unique domain name, the domain name is the name of your website, customers search for the website using the domain name, so choosing a right name is important.

After purchasing a domain, choose a right hosting service and plan to host your website and database that works for your business and most often the hosting service is scalable so choose a basic plan at the beginning and when the customers increase go for a better plan.

Almost all the hosting service providers also has an option to buy a domain name, so it would be easier to deploy.

2.7 Maintain

Bug Fixes

Bugs can be of different varieties: some are critical and really hinder your app's functionality, while others are more inconspicuous. But no matter which variety of bugs appears in your product, they need to be fixed.

Third-party API updates

Your web application is probably connected to third-party services such as Twitter and Facebook. But third-party services change their APIs. When this happens, your app needs to be updated with new service APIs. If

you don't update it, then your web application simply won't work.

This kind of maintenance is not too frequent, as most popular services like Facebook Messenger support both old and new API versions.

Security patches and updates

The purpose of updates is not to annoy you – though that may sometimes be the result. Updates contain important changes that improve the performance, stability and security of applications. Installing updates ensures that your software continues to run safely and efficiently. Software should always be patched or updated to avoid security issues.

Implementing new functionality

New functionality is generally added because a certain feature gets really popular and you decide to expand it, or because a competitor is offering a new feature and you want to keep up. When thinking about new

functionality, just keep in mind that more features doesn't always mean a better product.

Chapter 3

Conclusion

The report discussed on what is web and how to build a website/webapp. Most probably the development is done by hiring a freelancer or if the business is big then by hiring a company to do the work, It is important for an owner of a business to know how the website is being build, what technologies are used and to know the overall architecture of their website/webapp.