

# AWD Partial 1

## Objective of the Career

The main objective of the Software Engineering career is software development.

## Software Development Phases:

- Analysis
- Design
- Implementation
- Testing

## Important Subjects

- **Analysis and Design:**
- **Secure Software:**
- **Usability:** It is important for the user to know how to use the system.
- **Requirements:** Proper requirements elicitation is essential.
- **Software Quality:**
- **Software Testing:**

It is not as important to create classes in JavaScript as in Java.

Classes can also be created in Python.

In C, development is done through structural programming.

**Data:** The most basic format is plain text, and the most common one today is .json.

## The Importance of Web Development

Web development is important for organizations, companies, and enterprises. If a company is significant, it should have a presence on the web (a website).

Companies with little web knowledge often use **CMS (Content Management Systems)**. The most commonly used CMS is WordPress.

In general, they do not require advanced knowledge beyond providing company information. If I program a web application for a company and the product is large, it is common to use methodologies to carry out the development, such as agile methods like SCRUM.

These are typically led by a SCRUM Master.

CMSs generally allow you to handle the frontend using HTML, CSS, and JavaScript.

The **World Wide Web Consortium (W3C)**, established in 1994, regulates this field.

It is important to create clear diagrams to understand large projects. Examples include Class Diagrams and Entity-Relationship Diagrams.

The three main technologies for web development are:

- HTML
- CSS
- JavaScript

A web application is similar to other applications in its development:

## SCRUM

- **User Stories:** Describe everything the user will do within the system.
- **Product Backlog:** Contains system requirements and organizes them.
- **Sprint Backlog:** Defines what will be completed during the current sprint.

Once this is established, the following steps occur:

- **Sprint:** Should last 1 to 4 weeks.
- **Sprint Review:** Reviews all progress with the Product Owner.

## SCRUM Roles

- **User Stories:** Product Owner, SCRUM Master.
- **Product Backlog:** SCRUM Master.
- **Sprint Backlog:** Development Team and SCRUM Master.

After completing a **Sprint**, the process starts over and integrates with previous progress.

Typically, web applications are programmed on servers. For example:

- **Apache:** PHP.
- **Node.js:** JavaScript.
- **IIS:** .NET.

An **API** can be created using Node.js, PHP, or Python.

**CGI:** A technical process that allows web developers to create dynamic and personalized content for web pages.

The sole task of the web server is to deliver files.

## HTTP METHODS: GET, POST, PUT, DELETE

### Types of Web Applications

#### 1. Static Web Pages:

- Do not process information.
- Mainly display visual files:
  - .JPG
  - .GIF
  - .AVI
  - .WPS, etc.

#### 2. Dynamic Web Pages:

- Provide more functionality.
- Use frameworks and communication languages such as:
  - JavaScript → React.
  - Laravel → PHP.
  - Python.

### Web Application Types:

- **Simple Web:** A single page.
- **Animated Web:** Includes animations.
- **E-Commerce:** Virtual stores for selling products.

- **Portal:** Provides information and links to various sites.
  - **Progressive Applications.**
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## Single Page Application (SPA)

- **Definition:** A web application that loads completely in the browser once and then dynamically updates its content without needing to reload the entire page.
  - **Advantages:**
    - Smooth user experience.
    - Fast transitions between views.
    - Reduced bandwidth usage.
  - **Example:** Gmail, Google Maps.
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## Multiple Page Application (MPA)

- **Definition:** A web application consisting of several independent pages, each requiring a full browser reload when accessed.
  - **Advantages:**
    - Suitable for large volumes of content.
    - Easier to optimize for SEO.
  - **Example:** Amazon, eBay.
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## Animated Web Applications

- **Definition:** Web applications that use animations, visual effects, or interactive graphics to enhance the user experience and make the interface more appealing.
  - **Advantages:**
    - More visually attractive.
    - Improved user experience.
  - **Example:** Design studio websites, interactive portfolios.
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## E-Commerce

- **Definition:** An application or website designed to enable the buying and selling of products or services online.
  - **Advantages:**
    - Facilitates fast and secure transactions.
    - Accessible 24/7.
  - **Example:** Shopify, Mercado Libre.
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## Portals

- **Definition:** Web applications that act as a centralized entry point to access various resources, services, or content personalized for the user.
  - **Advantages:**
    - Centralized information and services.
    - Personalization based on user profiles.
  - **Example:** Educational portals like Moodle or corporate portals.
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## Progressive Web App (PWA)

- **Definition:** A web application that combines the best of web and native apps, offering features like push notifications, offline functionality, and cross-platform compatibility.
  - **Advantages:**
    - No installation needed from an app store.
    - Works offline and in unstable networks.
    - Automatic updates.
  - **Example:** Twitter Lite, Uber.
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## Clean Code 6 to 10

The code must be readable but also must also be robust, to support the code  
Objects expose behavior but hide data, and that data is exposed in functions  
Is better to use exceptions before exceptions

Each exception that you should provide enough content to determine the source and location of a(n) error

Returning null from methods is bad, but passing null into methods is worse

First Stand For:

The caller must check for errors immediately after the call

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**Dynamic Web Application:** use React, Angular, Node.js, Js to the front end

**Single page application:** Usually don't need to change the web page as Paypal, it implements follow the concept AJAX

**Multiple Page Application:** It is an application that had multiple pages, they don't use HTML they usually use templates, as WORDPRESS, DRUPAL, JOOMLA

**E-commerce** Usually is used to sell and buy products as Amazon

**Portals:** They are used to show information

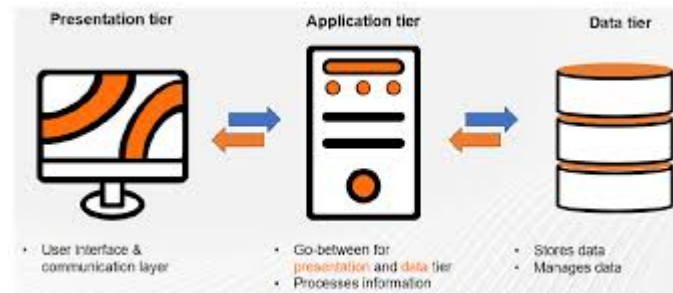
**PWA Progressive Web Applications.** Known as web cross platform applications they are similar to mobile applications. They are built with standard technologies as HTML, CSS and JavaScript, the principal advantage they improve the adaptability and the speed, they can work online or offline with a poor connection we can access to the services. Principal Examples: Spotify, Starbucks, BMW

## WEB MOBILE

They were built with WML (Wireless Markup Language) and XHTML, this makes that the webpage could render better

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## Tier-Architecture



It is divided into layers, specifically three main layers: presentation, application, and database.

- The **backend** performs rendering and retrieves information, while the **frontend** builds the interface.
- Rendering on the backend is generally considered more secure.

## Server-Side Rendering (SSR):

Fetches all the files to build the page.

## Client-Side Rendering (CSR):

Fetches the files one by one.

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## HTTP Methods:

- **GET:** Read
- **POST:** Create
- **PUT:** Update
- **DELETE:** Delete

**HTTP:** Provides resources (web pages, MIME types).

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**Hosting Services:** Must support the programming language being used.

- **Infrastructure as a Service (IaaS):** Purchase a virtual server with an operating system.
- **Platform as a Service (PaaS):** Provides tools and services for application development.
- **Software as a Service (SaaS):** Storage services.

**Microservices architecture:** Cloud services charge based on usage, accepting requests through port 80, and if secured, through port 443.

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**Web Development:** Can be done with any programming language or framework.

- **Laravel (PHP)**
- **JSP**
- **Servlets**
- **Node.js**
- **Bootstrap**