SDA ASSIGNMENT

SUBJECT

SOFTWARE DESIGN AND ARCHITECTURE

TEACHER

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Architectural Evolution of Angular Framework

Angular is a widely-used open-source web application framework developed by Google. Since its inception, it has undergone significant architectural changes to enhance performance, developer experience, and adaptability to modern web development needs.

1. Introduction

Angular, initially released as AngularJS in 2010, was a groundbreaking framework that introduced two-way data binding and dependency injection. Over time, it evolved into a more modular and efficient framework, now simply known as Angular, with its first major release (Angular 2) in 2016.

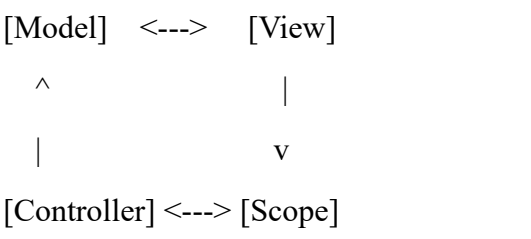
2. Selection of Framework

Angular was chosen due to its significant impact on web development and its well-documented evolution, making it an excellent case study for architectural progression.

3. Architectural Evolution

Release 1.0.0 (AngularJS)

- **Release Date:** October 20, 2010
- **Major Features:**
    - Two-way data binding
    - Dependency injection
    - Directives and templates
- **Architectural Diagram:**



- **Release Notes:** Introduced a dynamic way to build web applications with MVC architecture, allowing for real-time synchronization between model and view.

Release 2.0.0 (Angular 2)

- **Release Date:** September 14, 2016
- **Major Features:**
    - Component-based architecture

  - Improved dependency injection
  - Enhanced performance

- **Architectural Diagram:**

[Components]

|

[Services]

|

[Dependency Injection]

- **Release Notes:** A complete rewrite from AngularJS, focusing on a modular approach with components and improved performance.

Release 4.0.0

- **Release Date:** March 23, 2017
- **Major Features:**
  - Smaller and faster applications
  - Improved *ngIf and *ngFor
- **Architectural Diagram:**

[Components] --> [Templates]

| |

[Services] [Directives]

- **Release Notes:** Skipped version 3 to align the router package's version. Introduced new features and performance improvements.

Release 6.0.0

- **Release Date:** May 4, 2018
- **Major Features:**
  - Angular Elements for web components
  - Service Worker support
- **Architectural Diagram:**

[Components] --> [Angular Elements]

|

[Services] --> [Service Workers]

- **Release Notes:** Focused on making Angular more versatile by allowing the creation of web components and enhancing PWA capabilities.

Release 9.0.0

- **Release Date:** February 6, 2020
- **Major Features:**
    - Ivy compiler and runtime by default
    - Smaller bundle sizes
- **Architectural Diagram:**

[Components] --> [Ivy Compiler]

|

[Services] --> [Optimized Rendering]

- **Release Notes:** Introduced the Ivy compiler, resulting in smaller bundle sizes and improved debugging.

Release 12.0.0

- **Release Date:** May 12, 2021
- **Major Features:**
    - Nullish Coalescing
    - Strict mode enabled by default
- **Architectural Diagram:**

[Components] --> [Strict Mode]

|

[Services] --> [Enhanced Type Checking]

- **Release Notes:** Enhanced developer experience with stricter type checking and modern JavaScript features.

Release 15.0.0

- **Release Date:** November 16, 2022
- **Major Features:**
    - Standalone components

  - Directive composition API

- **Architectural Diagram:**

[Standalone Components]

|

[Directive Composition API]

- **Release Notes:** Introduced standalone components, reducing the need for NgModules, and added a new API for directive composition.

Release 17.0.0

- **Release Date:** November 8, 2023
- **Major Features:**
  - Signals for reactivity
  - Hybrid rendering support
- **Architectural Diagram:**

[Components] --> [Signals]

|

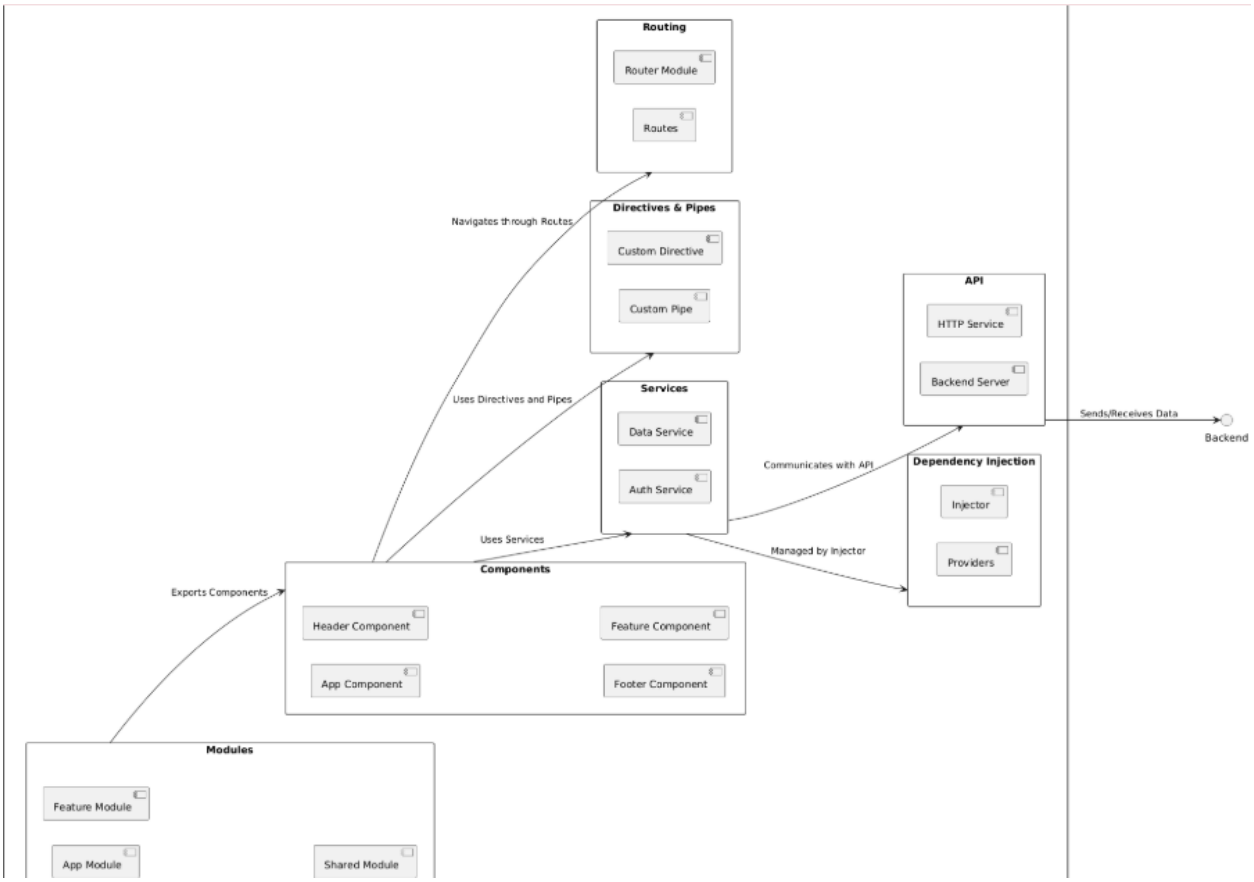
[Hybrid Rendering]

- **Release Notes:** Focused on modernizing Angular with signal-based reactivity and hybrid rendering capabilities.

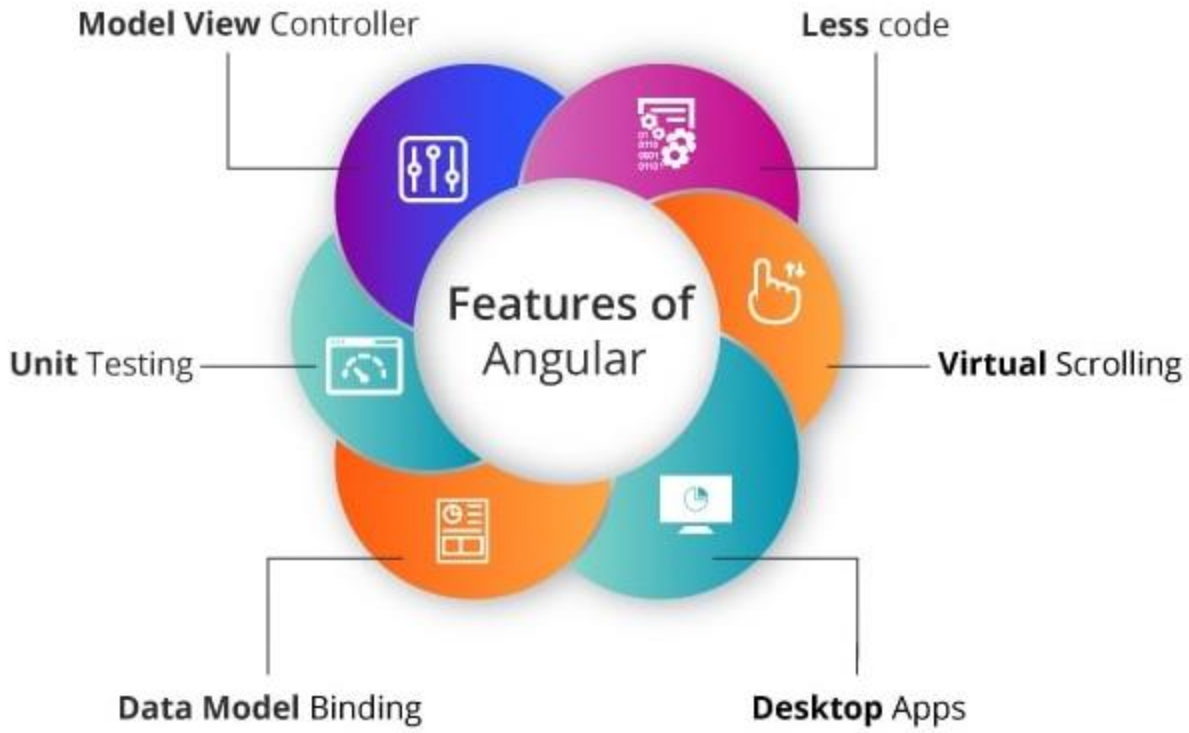
4. Team Contributions

- ***Aiman Shabbir:*** Researched and documented all releases, including features, architectural diagrams, and release notes.

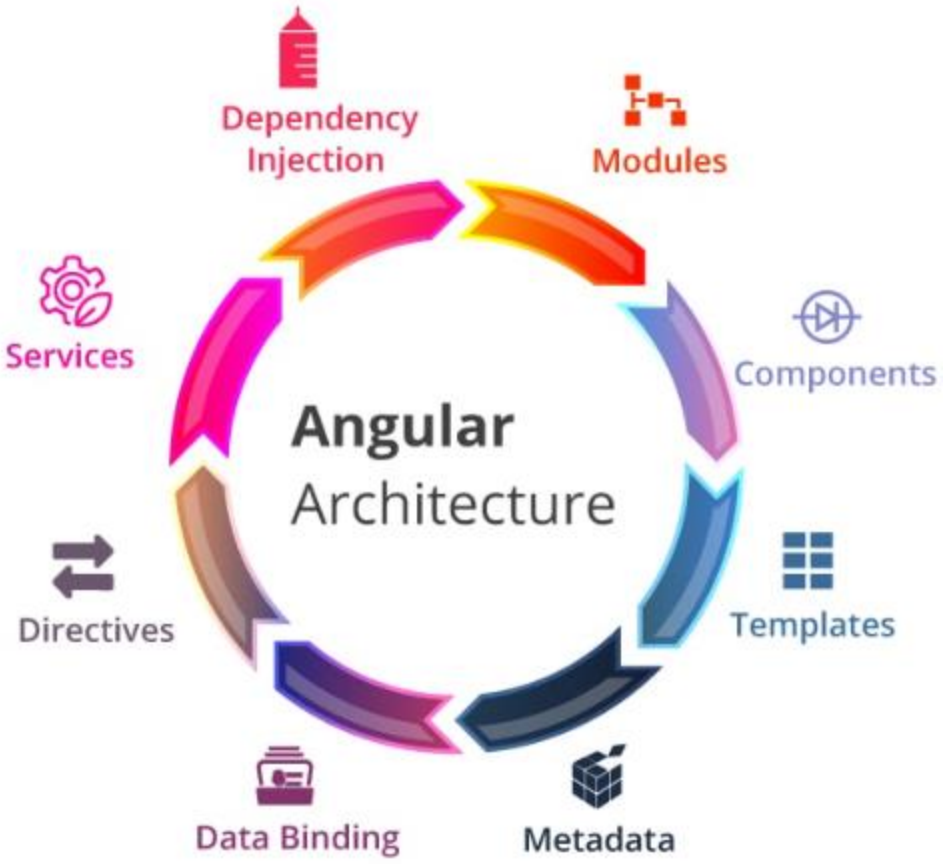
Angular framework diagram:



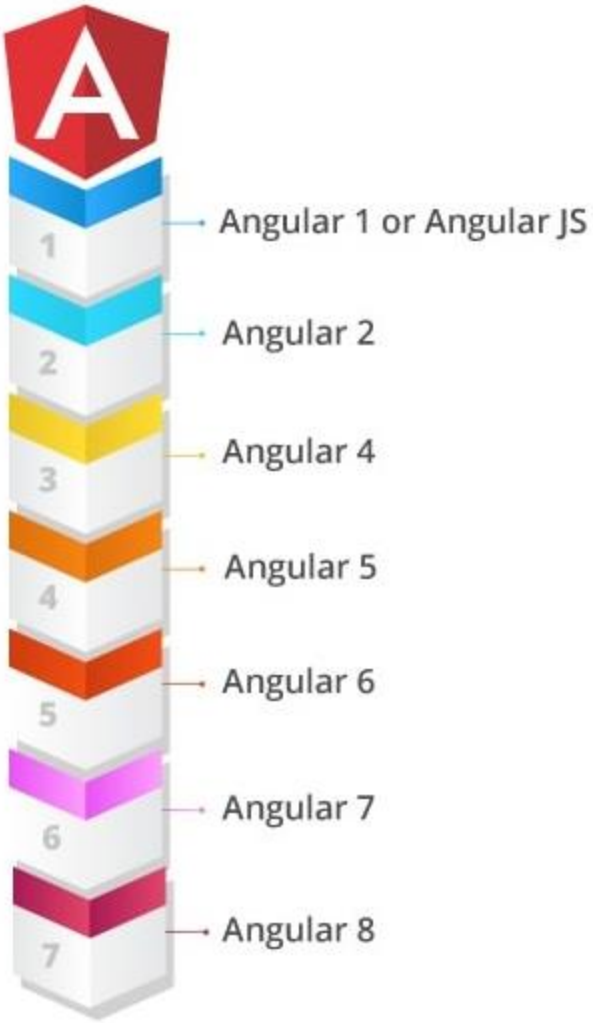
Features Of Angular:



Angular Architecture:



Different Angular Versions:


1
Angular 1 or Angular JS
2
Angular 2
3
Angular 4
4
Angular 5
5
Angular 6
6
Angular 7
7
Angular 8