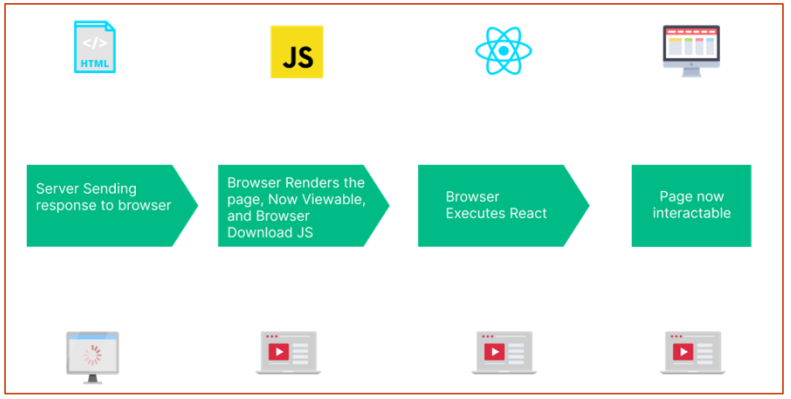
WEB DEVELOPMENT OVERVIEW

LONGNDT

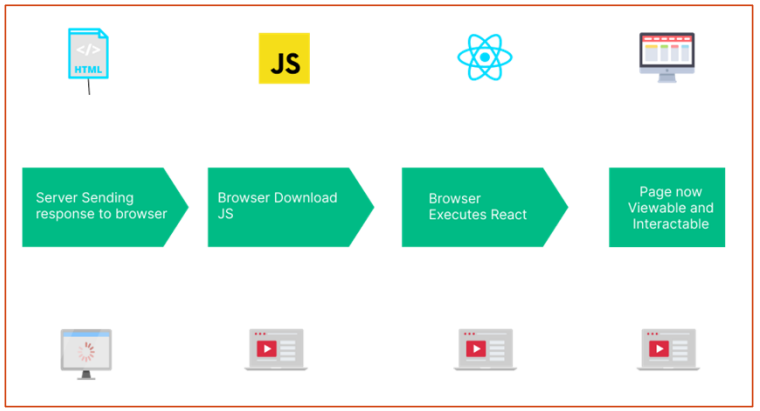
WEB DEVELOPMENT ARCHITECTURE STRATEGIES

- **Server-side rendering**
  - Front-end & back-end communicate without API
  - 1 project (technology/framework) for both front-end & back-end
  - Examples:
    - JavaScript: ExpressJS, NestJS
    - Java: Spring MVC, Spring Boot
    - .NET: .NET MVC, .NET Core
  - Typical websites:
    - VnExpress
    - Zing News
    - Thegioididong



WEB DEVELOPMENT ARCHITECTURE STRATEGIES

- **Client-side rendering (Single-page app)**
  - Front-end & back-end communicate with API
  - 2 projects (technologies/frameworks) for front-end & back-end
  - Examples:
    - Front-end: ReactJS, AngularJS, VueJS, NextJS, SveltJS, Ruby On Rails
    - Back-end: ExpressJS, NestJS, Spring Boot, Laravel, .NET Core, Flask
  - Typical websites:
    - ReactJS: Facebook, Instagram, Netflix
    - AngularJS: Trello, Paypal
    - VueJS: Gitlab, Xiaomi, Alibaba

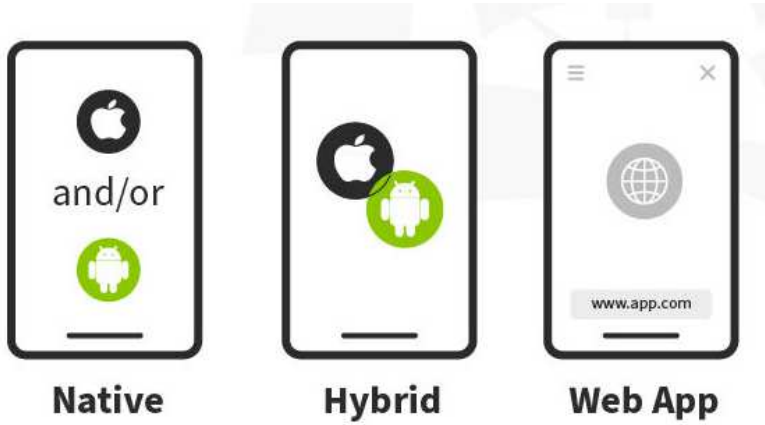


WEB DEVELOPMENT ARCHITECTURE STRATEGIES

- **Universal web app**
  - Combines of both Server-side rendering (SSR) & Client-side rendering (CRS)
  - "The best of both worlds"
  - Takes the avantages both of them together
    - SSR: Accessibility, page load times, SEO, social media support
    - CRS: cost-effective rending, ease of building and maintaining
  - Examples:
    - SSR: Admin/Management site
    - CRS: User/Customer site

WEB DEVELOPMENT ARCHITECTURE STRATEGIES

- **Hybrid web app**
  - Combines of both native and web app
  - Current trend of application development
  - Advantages:
    - Multiple platforms: web, mobile (iOS, Android)
    - Faster build time
    - Easier to update
    - Can work online and offline
  - Examples:
    - React Native
    - Flutter
    - Unity



WEB DEVELOPMENT ARCHITECTURE STRATEGIES

	Server-side rendering	Client-side rendering
Advantages	Better SEO (Search Engine Optimization) and page positioning	Less load on server
	Fast initial loading	Better User Interface (UI)
	Faster Largest Contentful Paint (LCP)	Reduced server-side resource
Disadvantages	Frequent server requests	Slower initial load time
	Slower time-to-interactive	Low SEO score (if implemented incorrectly)
	Slower time to page redirection	Caching is not possible until page is fully loaded

DATABASE FOR WEB APPLICATION

- **SQL**
  - SQL: Structured Query Language
  - Relational database
  - Examples:
    - MySQL
    - SQL Server
    - SQL Lite
    - Oracle
    - PostgreSQL

DATABASE FOR WEB APPLICATION

- **No-SQL**
  - No-SQL: Not only SQL
  - Non-relational database
  - Examples:
    - MongoDB
    - GraphQL
    - Neo4j
    - Cassandra
    - Couchbase

DATABASE FOR WEB APPLICATION

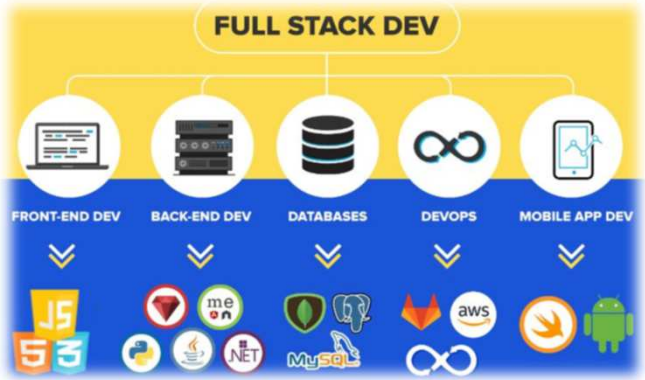
	SQL	No-SQL
Data Model	Tables with fixed rows and columns	Document, Key-value, Wide-column, Graph
Schema	Strict: Fixed, static or predefined schema	Flexible: Dynamic schema
Scalability	Vertical scalable (upgrade RAM, CPU, SSD,…)	Horizontal scalable (add more servers,..)
Joins	Required	Not required
Data to Object Mapping	Requires ORM (Object-Relational Mapping)	Do not requires ORM

FULL-STACK WEB DEVELOPMENT TECHNOLOGIES

- **MERN:**
  - MongoDB: database
  - ExpressJS: middleware
  - ReactJS: front-end
  - NodeJS: back-end

- **MEAN:**
  - MongoDB: database
  - ExpressJS: middleware
  - AngularJS: front-end
  - NodeJS: back-end

- **MEVN:**
  - MongoDB: database
  - ExpressJS: middleware
  - VueJS: front-end
  - NodeJS: back-end



CLOUD SERVICES FOR WEB DEPLOYMENT