

**دانشگاه کردستان** University of Kurdistan زانکوی کوردستان

# An A-to-Z Guide to Modern Web Development

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# Agenda

- Web development process
- Types of Web Applications:
  - > Static, Dynamic (CMS, Custom or Bespoke, SaaS)
- Domain Name Registration
- Web Hosting Options
- Web Development Technologies
  - Front-End vs Back-End
- How to make Search engine friendly web apps
- Maintenance

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### Network impact on software types



#### 1. Goal

- Static
- Dynamic
  - Routine
    - CMS
  - Customized (Bespoke or SaaS)

#### 2. Domain name registration

- Global
- Local
- Free
- Other!

#### 3. Development

- Graphics
- Front-end
  - > HTML 5
  - > CSS 3
  - JavaScript
- Back-end
  - > PHP, RUBY. .NET, JS
  - > Databases
    - MySQL
    - SQL Server
    - NoSQL



- 3. Development (Advanced)
  - Front-end frameworks
    - > Bootstrap (by X/Spotify/LinkedIn/Coursera/...)
      - Based on CSS
      - Used For: Static sites, admin dashboards, Startups (for quick MVP development)
    - > React (by Meta/Facebook)
      - Based on: JavaScript (JSX JavaScript XML)
      - Used For: Single-Page Applications (SPAs), dynamic Uls
    - > Angular (by Google)
      - Based on: TypeScript (a superset of JavaScript)
      - Used For: Enterprise-level applications, complex SPAs
    - > Vue.js (by Evan You)
      - Based on: JavaScript (with optional TypeScript support)
      - Used For: Lightweight SPAs, gradual adoption in projects









- 3. Development (Advanced)
  - Back-end frameworks

Active Server Pages (ASP.NET)	C#, VB.NET
Enterprise Java Beans (EJB)	Java
JavaServer Pages (JSP)	Java
Spring	Java
Rails	Ruby
Django	Python
Zend	PHP
Sinatra	Ruby

#### > Development (Advanced)

#### **Relational Databases (SQL)**

These databases follow a structured, tabular format and use SQL for queries.

- 1. MySQL Widely used for web applications and open-source projects.
- 2. PostgreSQL Known for its extensibility and advanced features.
- 3. Microsoft SQL Server Ideal for enterprise applications and businesses.
- 4. Oracle Database Used by large corporations for mission-critical applications.
- 5. SQLite Lightweight and embedded in applications like browsers and mobile apps.



#### **NoSQL** Databases

These databases offer flexible schema models and scale efficiently for large datasets.

- 1. MongoDB A document-based database using JSON-like structures.
- 2. Cassandra Designed for high scalability and big data applications.
- 3. Redis A key-value store popular for caching and real-time analytics.
- 4. CouchDB Uses a document model with a RESTful API for easy integration.
- 5. Neo4j A graph database optimized for managing relationships in complex data.

#### 4. Hosting

- Windows based
- Linux Based
- Other Services
  - > Email

#### 5. Search engine optimization

- Increasing the rank of website in search results

#### 6. Maintenance

- Domain name & hosting renewal
- Bug fixing
- Update

# Traditional Hosting vs. Cloud Hosting

- > Infrastructure
- > Scalability
- > Cost Model
- > Maintenance
- > Flexibility
- > Environmental Impact



# Main cloud hosting

> More than webhosting



## SaaS

- > Software as a Service
- > Toward software on the web

# Improving productivity

#### Automation

- replacing tedious manual tasks with tools
  - > to save time, improve accuracy, or both

#### – Examples

- > Git
- Version control systems
- > Cucumber
- > helps automate turning user stories into acceptance tests
- > Pivotal Tracker
- automatically measures Velocity, which is a measure of the rate of adding features to an application
- > Rspec
- > helps automate the unit testing process.

# SaaS and Service Oriented Architecture

#### – Idea

- > Do not install software on user computer
- > run the software centrally on Internet-based servers,
  - and allow users to access it via a Web browser

#### - Salesforce

- > the first large company to fully embrace this new model
- which was dubbed Software as a Service (SaaS)

#### - SaaS is popular in everyday use

> searching, social networking, and watching videos



# SaaS

#### > advantages for both users and developers

- 1. No installation:
  - Customer don't have to worry whether their hardware is the right brand or fast enough
  - Not dependency on OS
- 2. Data is kept with the service
  - No need to backup
- 3. Group level use
  - User interact
- 4. Centralization
  - data is large
  - data updated frequently
- 5. Only a single copy of the server software
  - runs in a uniform
  - User do not need upgrade
- 6. Cheaper service



# SaaS

SaaS Programming Framework	Programming Language	Introduced
Active Server Pages (ASP.NET)	C#, VB.NET	1996
Enterprise Java Beans (EJB)	Java	1997
JavaServer Pages (JSP)	Java	1999
Spring	Java	2002
Rails	Ruby	2004
Django	Python	2005
Zend	PHP	2006
Sinatra	Ruby	2007

- Rails has embraced the Agile lifecycle
  - > use the right tool for the job, even if it means learning a new tool or new language!

# SaaS and Agile

#### > Agile fitness with SaaS

- frequent upgrades of SaaS perfectly align with the Agile software lifecycle
  - Hence, Amazon, eBay, Facebook, Google, Microsoft and other SaaS providers all rely on the Agile lifecycle
  - The Agile process is an excellent match to the fast-changing nature of SaaS applications.
- One pitfall
  - > developers could not make extensive use of software third-party *libraries*
  - containing code to perform tasks common to many different applications.
    Because these libraries were often written by others
  - > Missing the extensive access to hardware

# SaaS and SOA

- SaaS needs using services built and maintained by other developers for common tasks
- *service-oriented architecture* (SOA)
  - > in which a SaaS service could call upon other services
- Services that were highly specialized to a narrow range of tasks
  *microservices*
  - > Examples
    - credit card processing, search, driving directions
  - >

# Conclusion

- Higher and new programming languages and technologies
  - Speed up the software development process
- > Currently SaaS is the dominant form of software use



#### Question?

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