

Web Application Development

Produced
by

David Drohan (ddrohan@wit.ie)

Department of Computing & Mathematics
Waterford Institute of Technology

<http://www.wit.ie>



Waterford Institute of Technology
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Web Apps, Dev Tools & Frameworks

Data-centric applications in
the Browser & How to Build them.

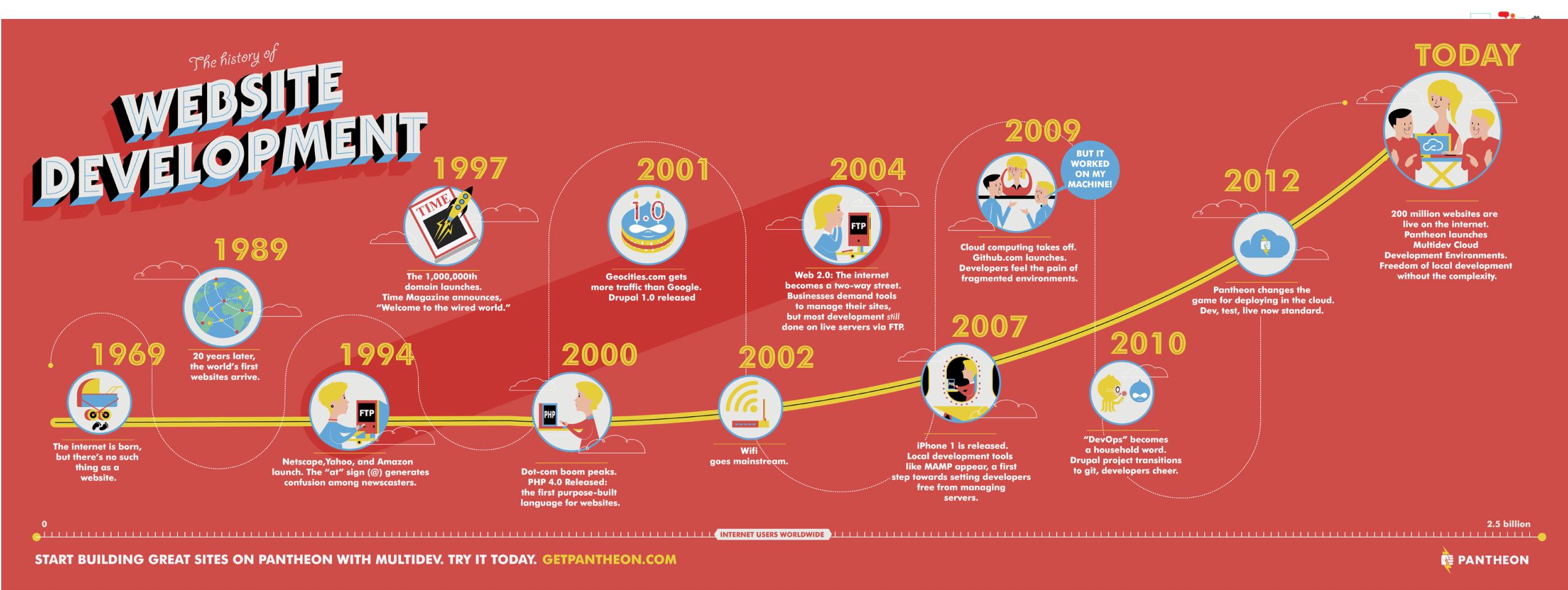




Agenda

- ❑ Brief History of Web Site/App Evolution
- ❑ Early Web Apps & AJAX
- ❑ Stages of Web Development
- ❑ Development Tools & Frameworks
- ❑ Single Page Application Frameworks (SPAs)
- ❑ Next Generation Development

The history of WEBSITE DEVELOPMENT



A brief history of Web Development

<https://pantheon.io/blog/history-website-development-infographic>



Early Web Apps

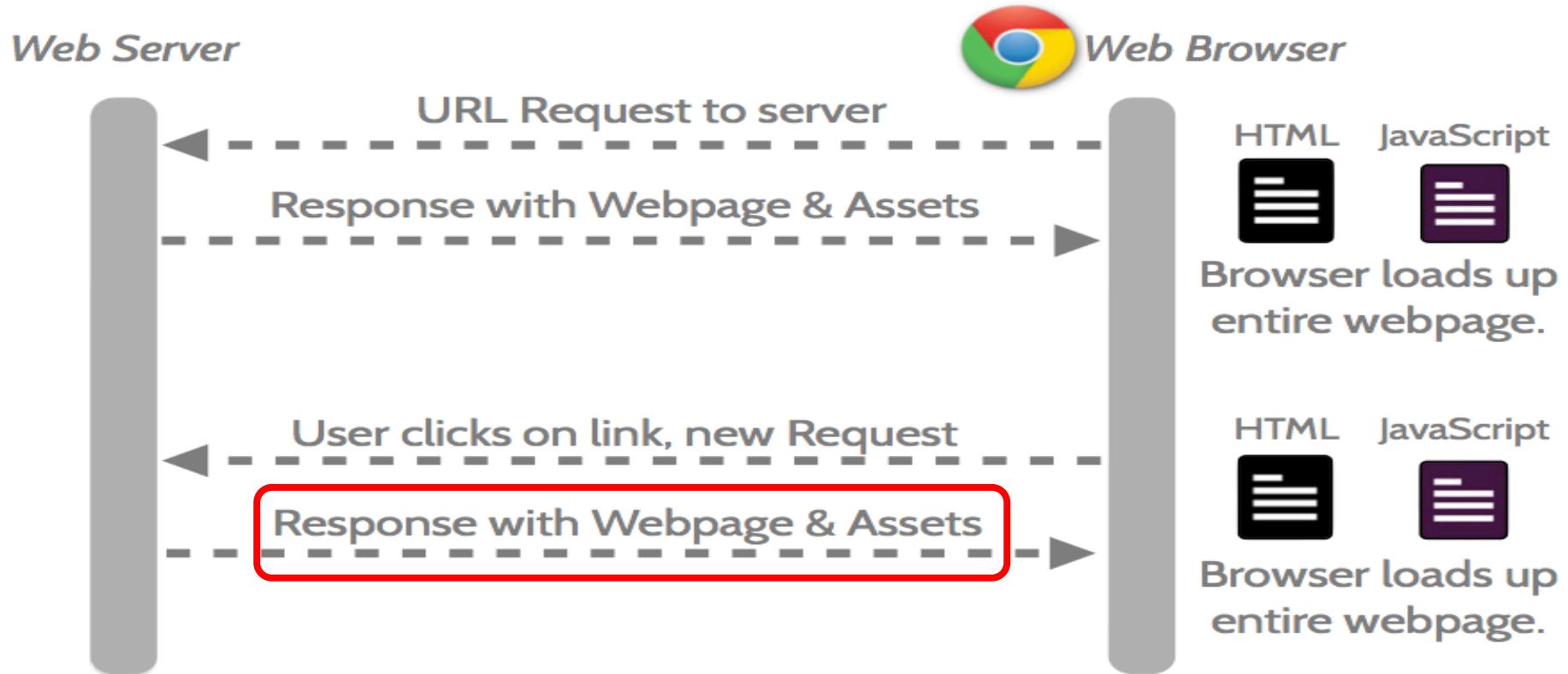
❑ Characteristics:

- Server creates pages / browser displays.
- Data input sent to and processed by the server
- Updated pages created on the server and resent to browser.

❑ For Example - PHP, JSP/Servlets, Struts, (and more recently) Ruby on Rails.



Early Web Apps.



❑ Disadvantages:

- Bad UX (User eXperience) – reload of all UI parts
- Poor performance



Web Evolution – AJAX (Asynchronous Javascript And Xml)



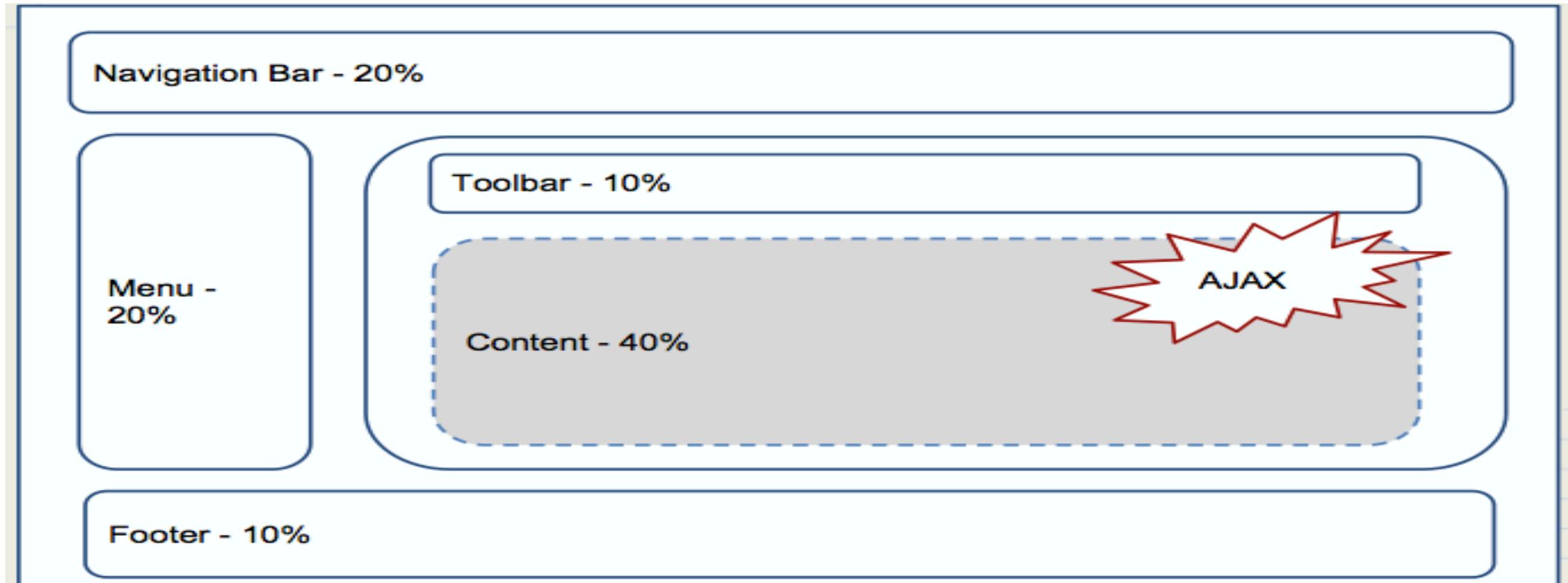


What is AJAX?

- ❑ AJAX = Asynchronous JavaScript and XML.
- ❑ Not a language but a technique.
- ❑ A technique for loading data (formatted as XML) in the background (asynchronous) and displaying it on the webpage, without reloading the whole page.
 - JSON formatting is now favoured over XML
- ❑ Examples: Gmail, Google Maps, Youtube.



Web Evolution - AJAX



Static

Dynamic



Web Apps - AJAX

❑ Interactive client-side web:

- Collect input from user.
- Update display.
- Communicate with server (AJAX)

❑ Client-side processing enabled by:

- JavaScript.
- DOM manipulation.
- HTTP server messaging.



Web Evolution – SPA Frameworks

- SPA (Single Page Application) frameworks – Client-side JavaScript MVC frameworks. (MVC covered below)
 - Examples:
 - ◆ AngularJS; Backbone; EmberJS; Knockout, many more ...
- Benefits:
 - Less boilerplate code.
 - Less effort on mundane programming tasks; allowing for better focus on what is ACTUALLY VALUABLE – THE LOGIC.
 - More efficiency in development.
 - Better client-side code architecture through clearer Separation of Concerns (SoC).
- All are built on core browser functionality – event-driven, asynchronous ; DOM manipulation; HTTP server communication



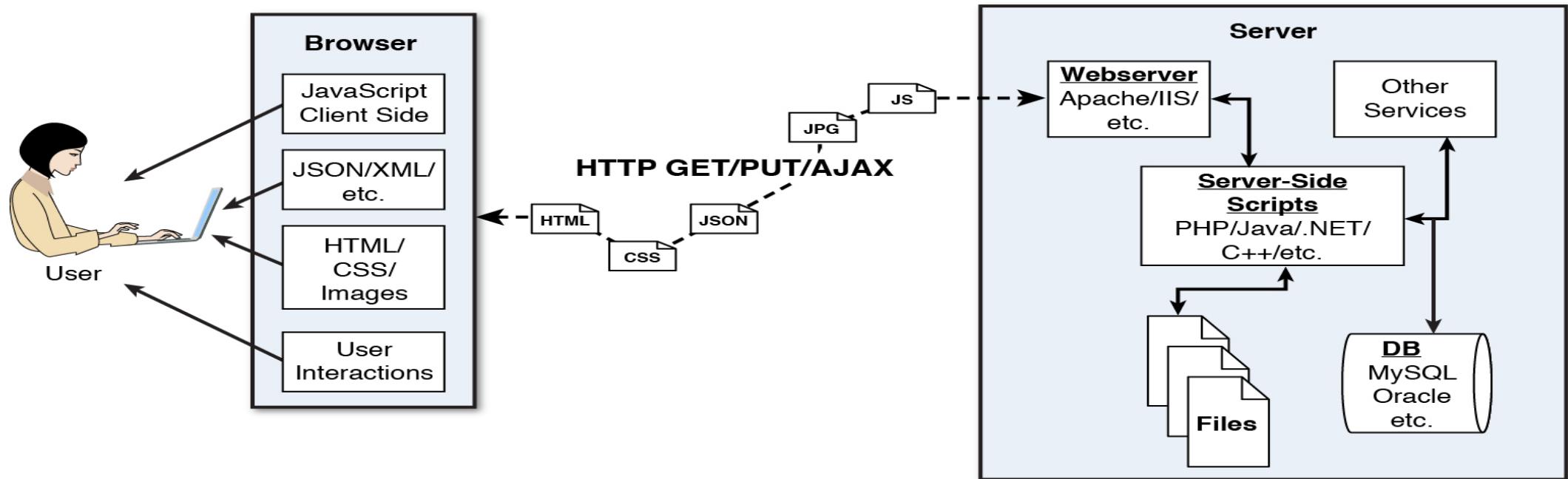
Web Evolution – SPA frameworks

□ Library Vs Framework

- Library (e.g. JQuery)
 - ◆ Passive functionality; Invoked by the application.
- Framework (e.g. AngularJS)
 - ◆ Provides application architecture (SoC); Deals with common mundane requirements; Invokes application code.

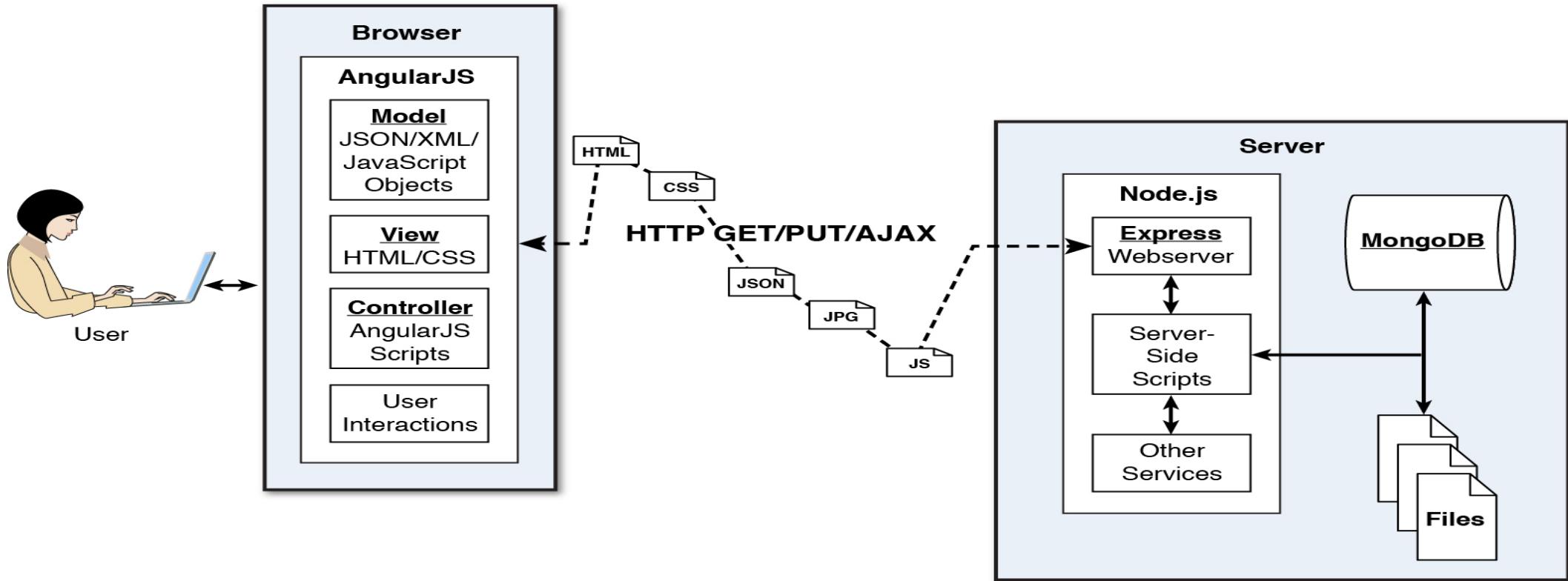


Components of a **Classic** Web App





Components of a MEAN Web App





Web Development Stages

1 – Concept Development

Write down the following:

- Who is this website for?
(the types of users)
- Why am I making it?
(what is the problem?)
- What is the **most important** thing visitors
should do on your website/app.
- Write, read. Write, read. Repeat.
- Sketch out (draw) your website/app 'look'.





Web Development Stages

2 – Prototype Development

- A “broken” version of your website:
 - Links work, but don’t lead to any content.
 - “User Journey” is complete:
 - “As a ... I want to ... ”
 - Quick to change and move things around if and when needed.

Presentation software	Mobile apps	Mobile prototyping applications		
gliffy	AppCooker	Hotspot apps	Wireframe / Mockup tools	Prototyping tools
Keynote	iMockups	APP IN SECONDS	balsamiq	AppSketcher
THE OMNI GROUP	Interface 2	FIELDTEST	mockups	axure
Visio	mockapp	invision	pidoco*	Indigo STUDIO
		POP	SOFTANDGUI	proto.io



Web Development Stages

3 – Actual Development

- Ideally, your requirements are complete
- Work at an iterative pace:
 - Develop at the lowest possible work unit
- Use the tool that suits you, and makes you the most productive:
 - Text Editor
 - IDE
 - Terminal
 - GUI

Atlassian



eclipse

JetBRAINS

NetBeans

Bowery





Web Development Stages

4 – Testing

- If you don't test; prepare to fail.
- Types of testing:
 - Functional Test (does the feature work?)
 - User acceptance test (is it what the user wants?)
 - Unit test (is the code stable?)
 - Coverage tests (are all code paths executing?)



Sinon.JS

Standalone test spies, stubs and mocks for JavaScript.
No dependencies, works with any unit testing framework.





Web Development Stages

5 – Deployment

□ Deployment Process Should Be:

- Documented
- Repeatable
- Predictable
- Rehearsed
- Tools help!





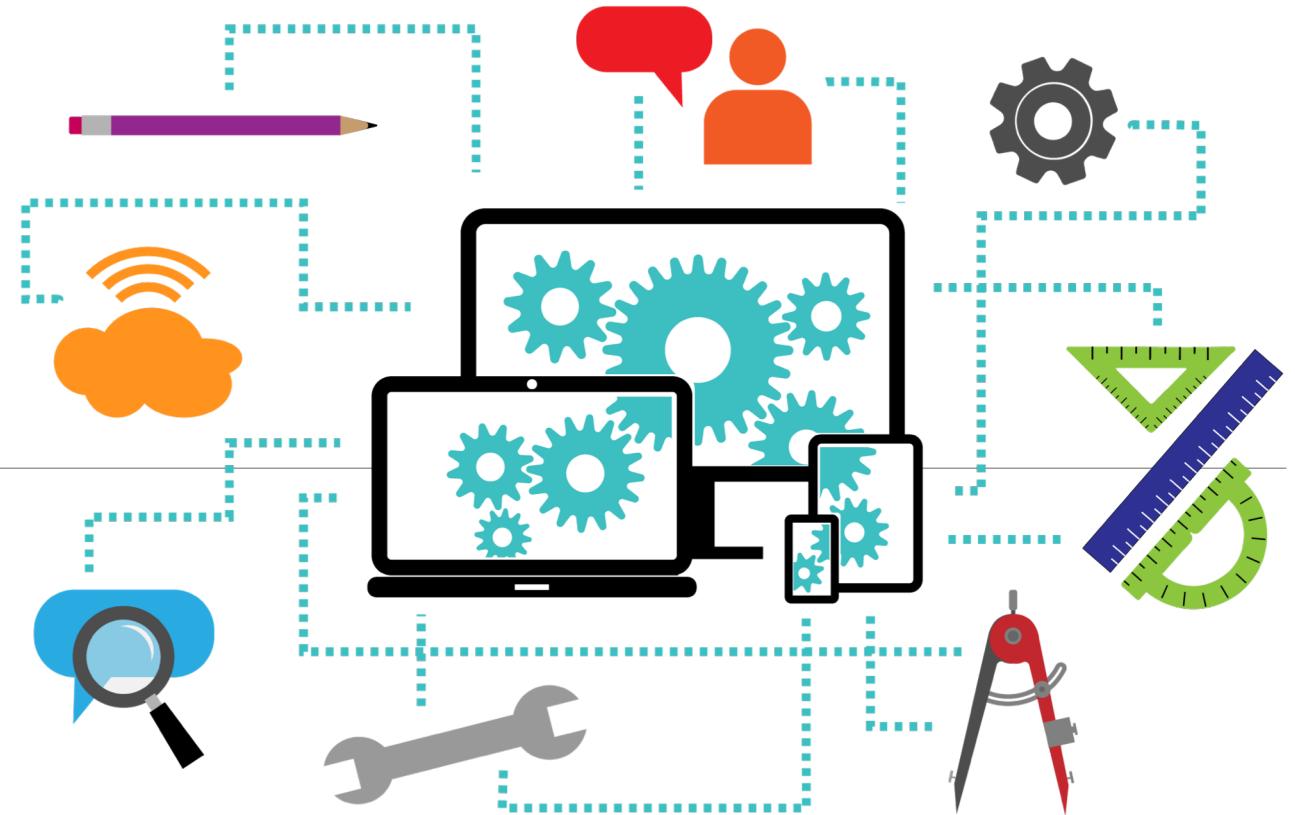
Web Development Stages

6 – Maintenance

- Small effort, big rewards
- Enable maintenance by tracking:
 - Successful requests
 - Failed requested
 - Repeated failed requests
 - Key function execution
 - Infrastructure



Development Tools & Frameworks







Categories of Tools & Frameworks: *

Server Side Development

django

 **spring**
by Pivotal™



 **Flask**
web development,
one drop at a time

 **GRAILS**
The Search is over

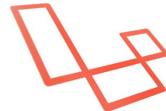
 **Pylons™**

play! 

 **cakePHP**

 **Symfony**

 **ZF**

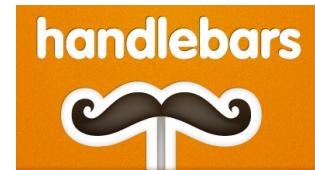
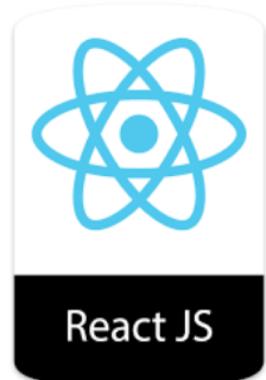
 **laravel**

 **.NET**
Framework



Categories of Tools & Frameworks: *

Frontend Development





Categories of Tools & Frameworks:

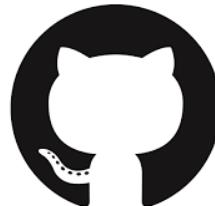
Platforms



SQUARESPACE



OPENSIFT



tumblr.



Blogger™



HIPPO



django
CMS





Categories of Tools & Frameworks: *

Development Helpers

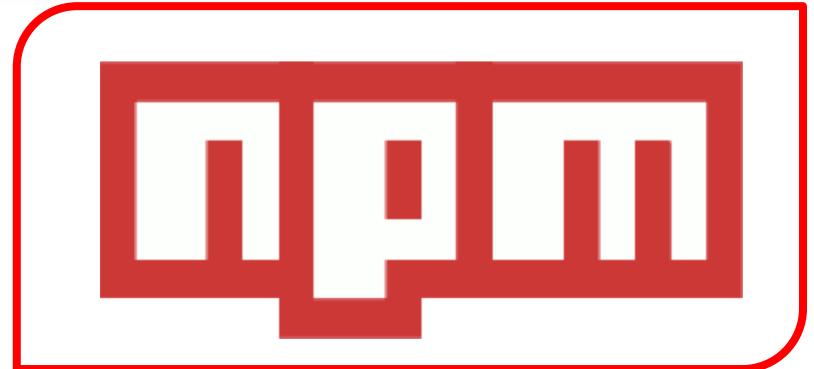


Bower



GRUNT

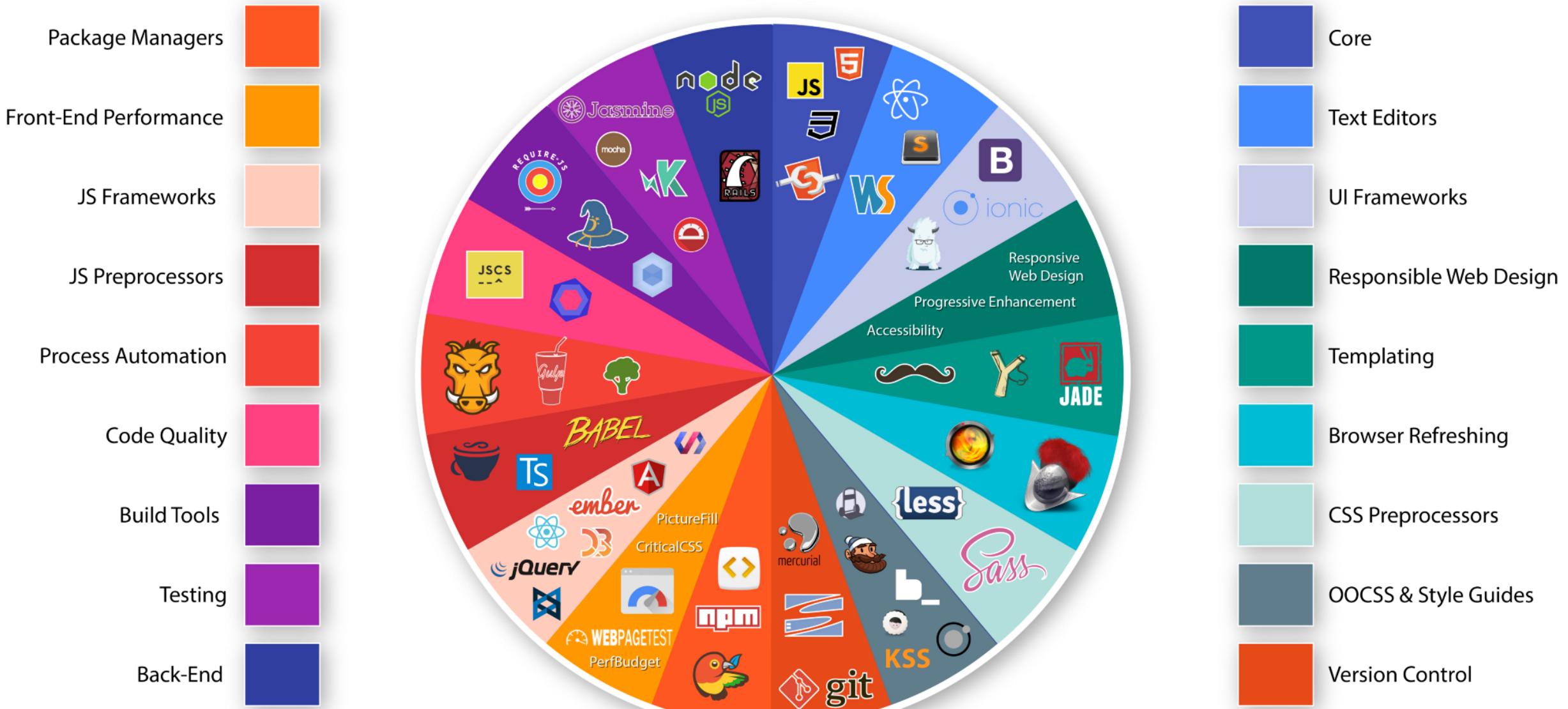
Gulp



YEOMAN



THE FRONT-END SPECTRUM





RECAP : How Does it All Work?

THE DETAILS



The Internet

A LARGE NETWORK OF COMPUTERS, CONNECTED THROUGH A COMMON NETWORK SPREAD ACROSS A LARGE AREA.



World Wide Web

AN INFORMATION NETWORK
BUILT ON TOP OF THE INTERNET USING HYPERLINKED DOCUMENTS.



HTML & HTML5

HYPertext Markup Language. A language consisting of a series of tags used to annotate documents that are to be linked together on the web. The latest version is 5



CLIENT SIDE

A TERM USED TO DESCRIBE TECHNOLOGY THAT RUNS ON THE DEVICE CONNECTED TO THE INTERNET AND REQUESTING DOCUMENTS FROM A SERVER.

EXAMPLES: JAVASCRIPT, FLASH, VBSCRIPT



SERVER SIDE

A TERM USED TO DESCRIBE TECHNOLOGY THAT RUNS ON THE SERVERS CONNECTED TO THE INTERNET PROVIDING ONE OR MORE SERVICES.



USER AGENT

THE TECHNICAL TERM FOR THE PIECE OF SOFTWARE THAT IS USED TO DISPLAY DOCUMENTS ON THE WORLD WIDE WEB (WWW).

EXAMPLE : GOOGLE CHROME, MICROSOFT EDGE



DOCUMENT OBJECT MODEL

A CONVENTION OF DESCRIBING AND INTERACTING WITH HTML DOCUMENTS AS A SERIES OF NODES ON A TREE.



TELNET

A PLAIN TEXT BI-DIRECTIONAL PROTOCOL USED TO COMMUNICATE WITH SERVERS. *IT IS ALSO THE NAME OF A PROGRAM THAT IS USED TO CONNECT OT SERVERS.*



TCP/IP IPv4 IPv6

PROTOCOLS USED TO COMMUNICATE WITH SERVERS ON THE INTERNET. EACH DEVICE THAT CONNECTS TO INTERNET NEEDS AN IP ADDRESS.



DOMAIN NAME SYSTEM

A DISTRIBUTED SYSTEM DESIGNED TO ASSIGN NAMES TO IP ADDRESSES, IN ORDER TO IDENTIFY RESOURCES ON A NETWORK.



WEB SERVER

A PIECE OF SOFTWARE CODE THAT LISTENS TO CONNECTIONS AND RESPONDS WITH DOCUMENTS OR OTHER RESOURCES ON THE WORLD WIDE WEB.



APACHE / IIS

NGINX / Node

POPULAR WEB SERVER USED ON THE INTERNET. APACHE STILL CONTROLS THE MAJORITY OF THE MARKET.



HTTP

HTTPS

HYPertext Transfer Protocol. A text protocol consisting of a series of commands used to send data and request documents over the web.



REQUEST / RESPONSE

THE NAME GIVEN TO THE COMPLETE CYCLE TO FETCH DOCUMENTS AND RESOURCES USING HTTP. THE CLIENT INITIATES THE REQUEST, AND THE SERVER SENDS THE RESPONSE.



FTP / SFTP

FILE TRANSFER PROTOCOL. A METHOD OF TRANSFERRING DATA BETWEEN SERVERS. SFTP IS SECURE-FTP



SECURE SHELL (SSH)

AN ENCRYPTED METHOD OF CONNECTING TO REMOTE COMPUTERS
AND EXECUTING COMMANDS.



GIT / **MERCURIAL /** **SUBVERSION**

POPULAR REVISION CONTROL SYSTEMS. THESE SYSTEMS TRACK CHANGES IN FILES ALLOWING EASY RECOVERY OF PREVIOUS VERSIONS.



Classic Web Application Architecture

BASIC BUILDING BLOCKS FOR MOST WEB APPLICATIONS



DATABASE
(the models)

Server Code
(controllers)

View
(code to render HTML)

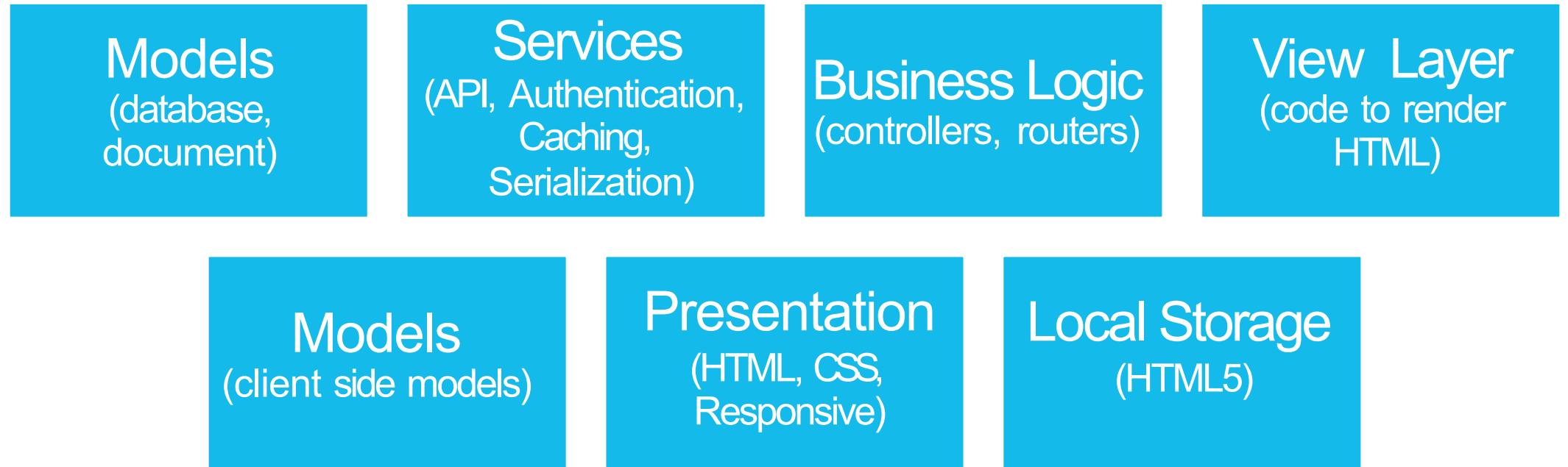
Client Side
JavaScript
(jquery components)

HTML Templates;
CSS; layouts



Modern Web Application Architecture

ADVANCED APPLICATIONS – FOR ADVANCED DEVICES





Designed by DevNetwork.com - May 2014



References

- https://www.slideshare.net/burhankhalid/gust-webdevelopment2015apr?from_action=save



Questions?