Web Application Development

Produced by

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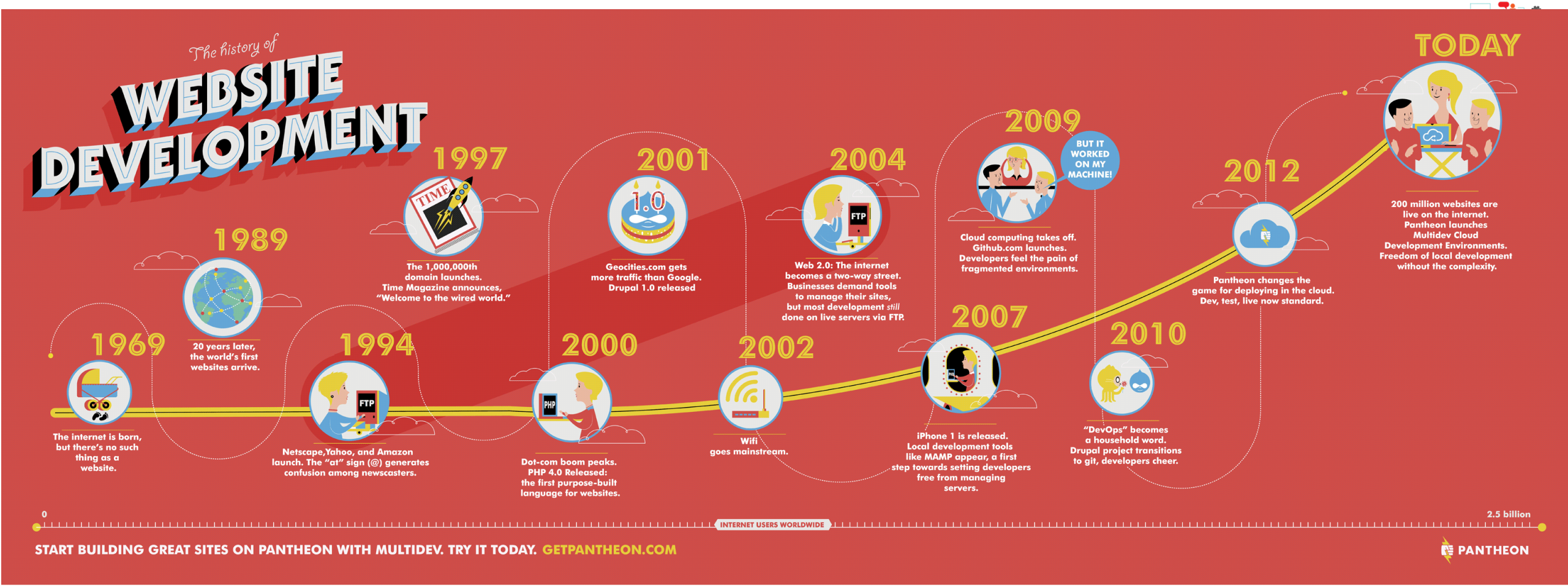
Web Apps, Dev Tools & Frameworks

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



A brief history of Web Development

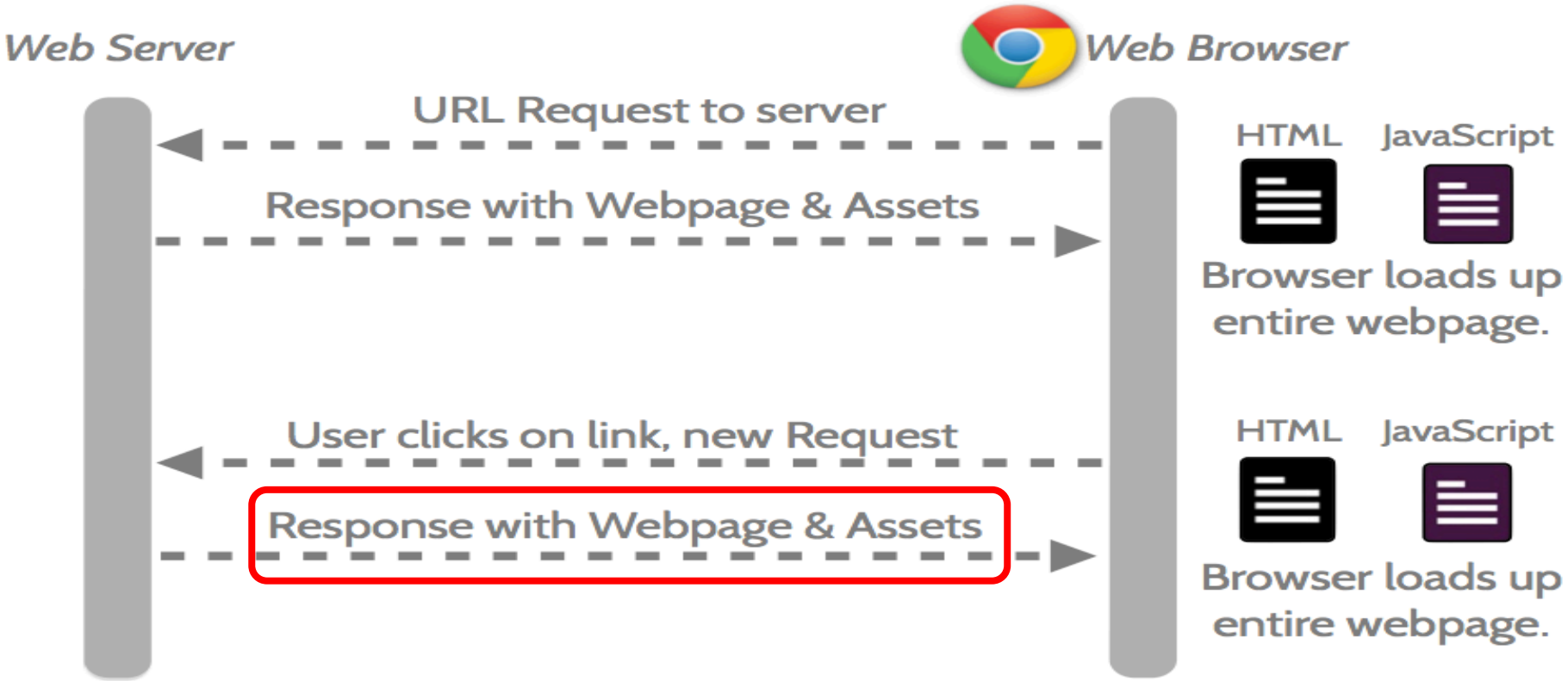
https://pantheon.io/blog/history--website--development--infographic

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.

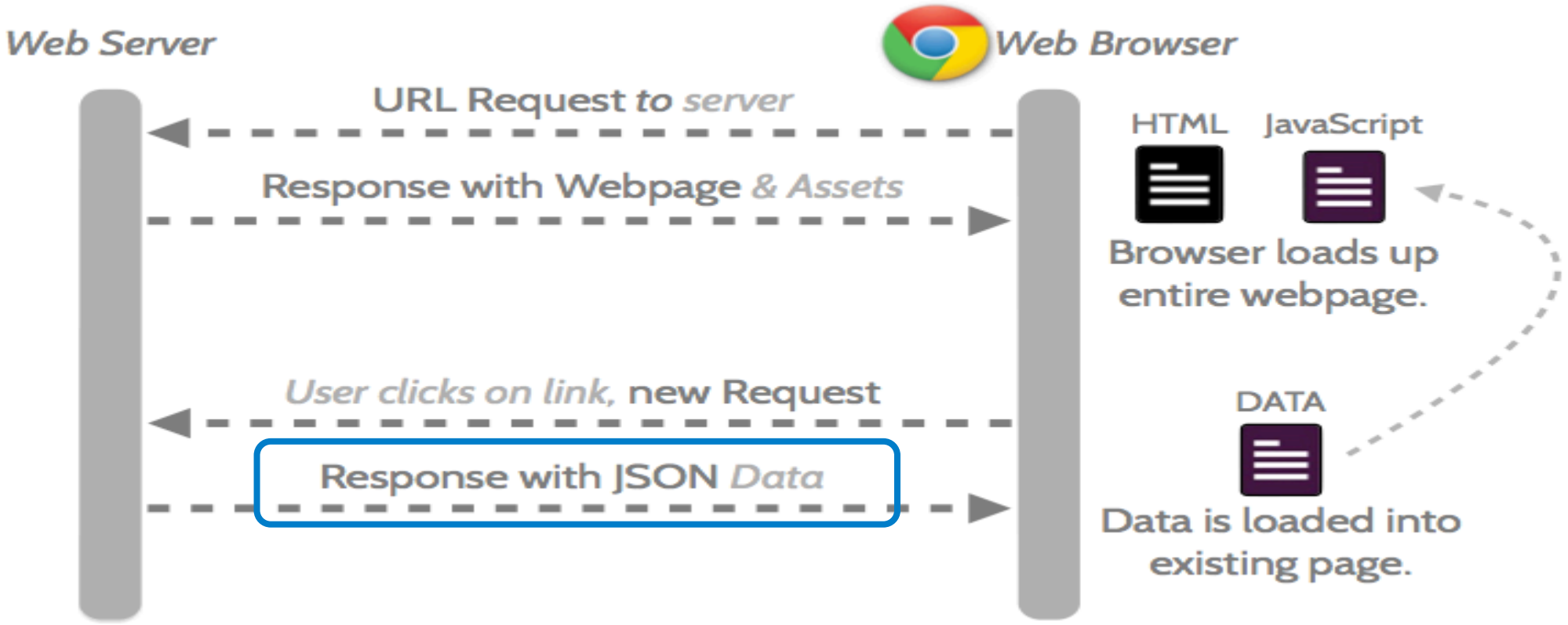
- For Example - PHP, JSP/Servlets, Struts, (and more recently) Ruby on Rails.

Early Web Apps – Request/Response cycle



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

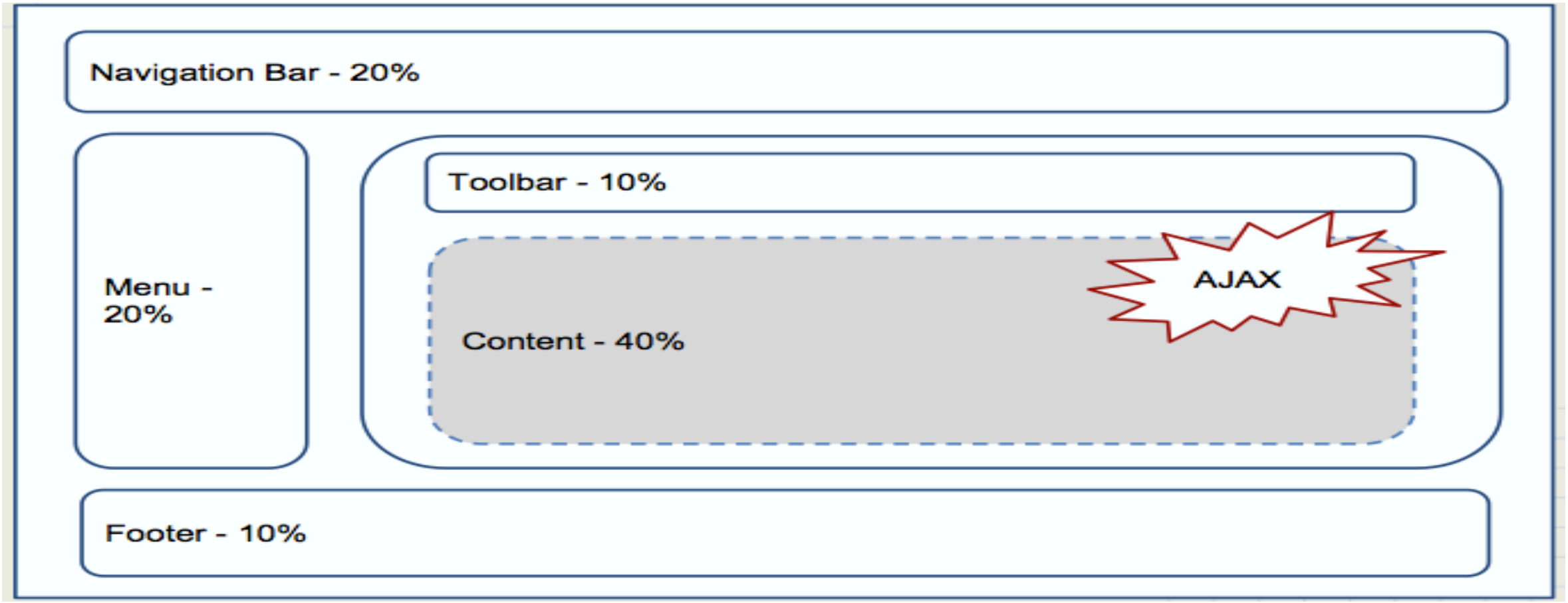
Web Evolution – AJAX (Asynchronous Javascript And Xml)



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.

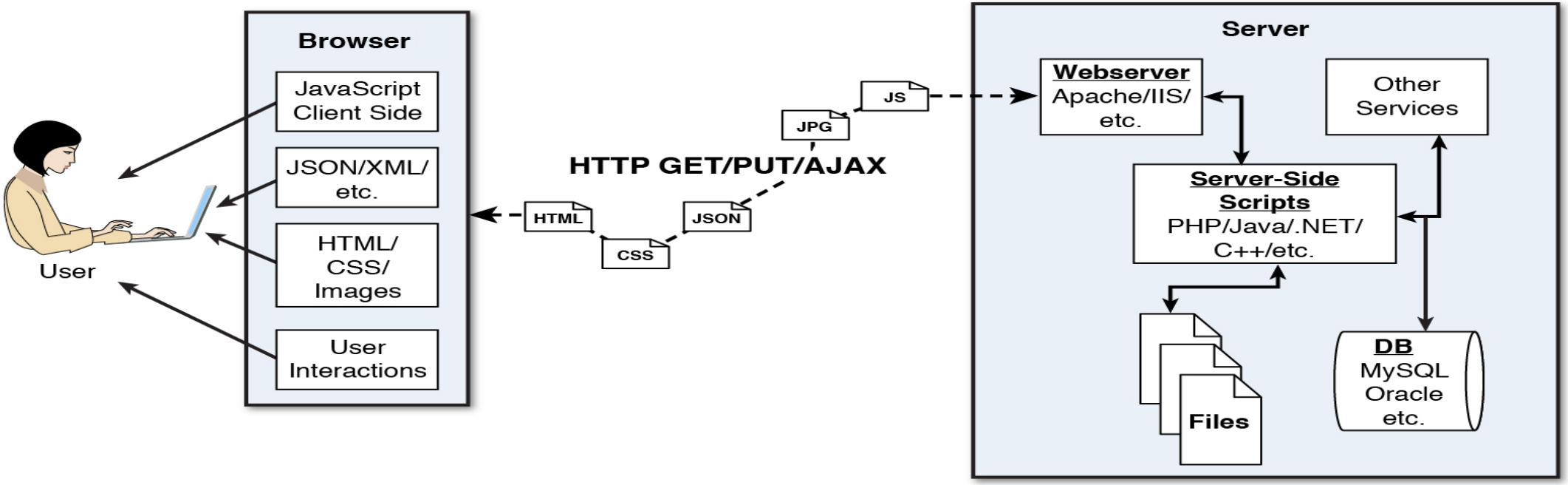
Web Evolution – SPA Frameworks

- SPA (Single Page Application) frameworks – Client-side JavaScript MVC frameworks. (MVC covered below)
  - Examples:
    - **VueJS,** AngularJS; Backbone; EmberJS; React, 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

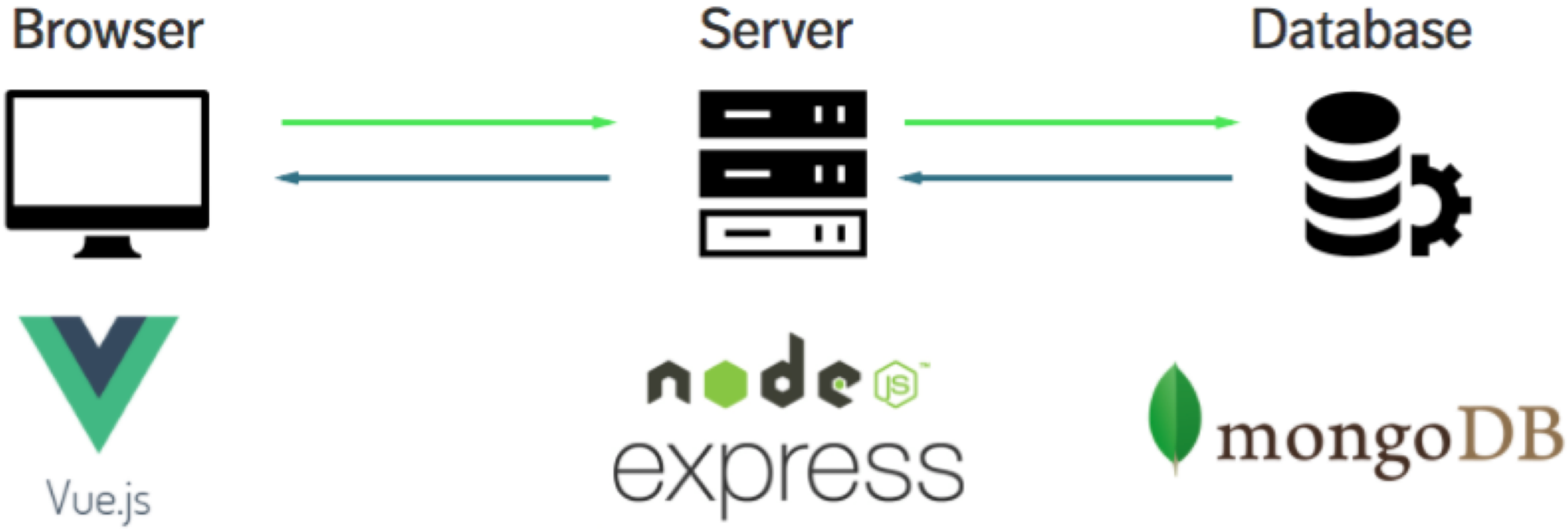
Web Evolution – SPA frameworks

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

Components of a Classic / Basic Web App (Pre SPAs)



Components of a MEVN Web App (SPA) *



All Javascript !

Web Development Stages

1 – Concept Development

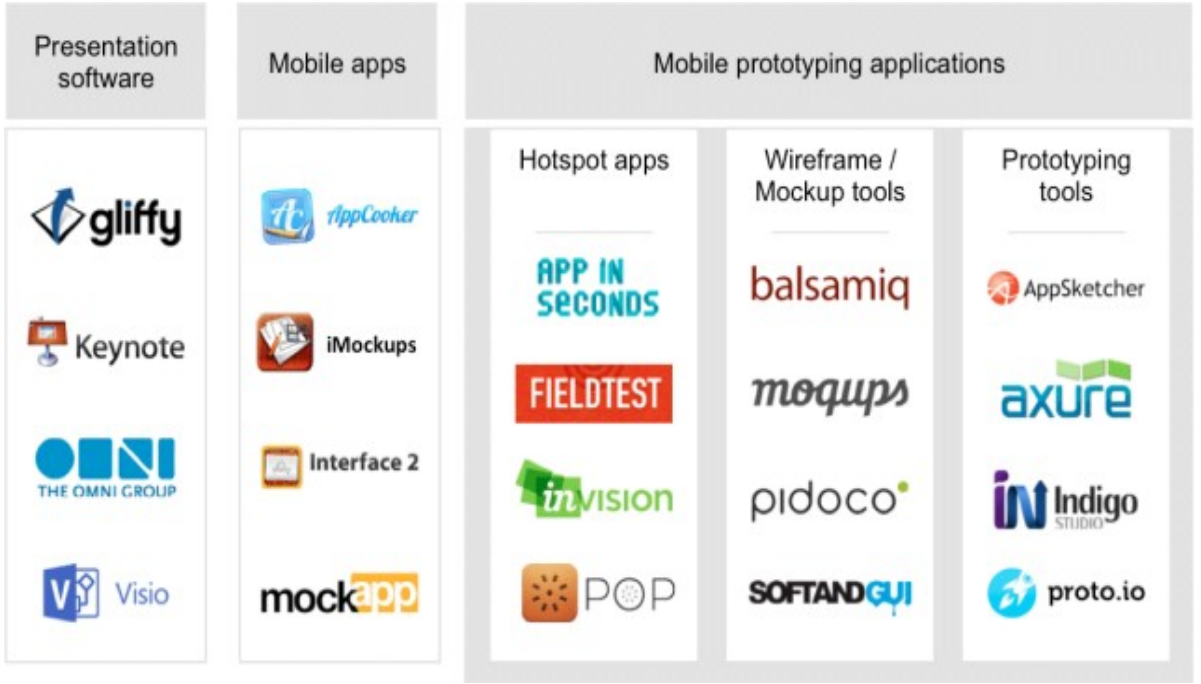
- Write down the following:

- Who is this website/app 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

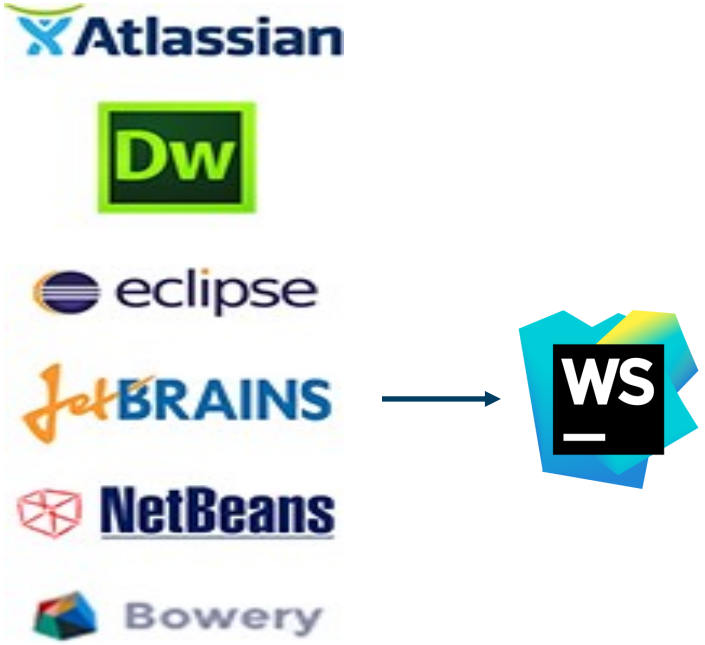
- A “broken” version of your website:
  - Links work, but don’t lead to any content.
  - “User Journey” is complete:
    - “As a … I want to … “
  - Quick to change and move things around if and when needed.



Web Development Stages

3 – Actual Development

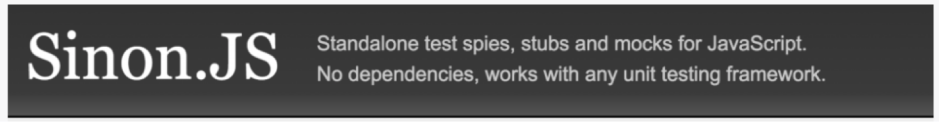
- Ideally, your requirements are complete
- Work at an iterative pace:
  - Develop at the lowest possible work unit
- Use the tool that suits you, and makes you the most productive:
  - Text Editor
  - IDE
  - Terminal
  - GUI



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?)



Web Development Stages

5 – Deployment

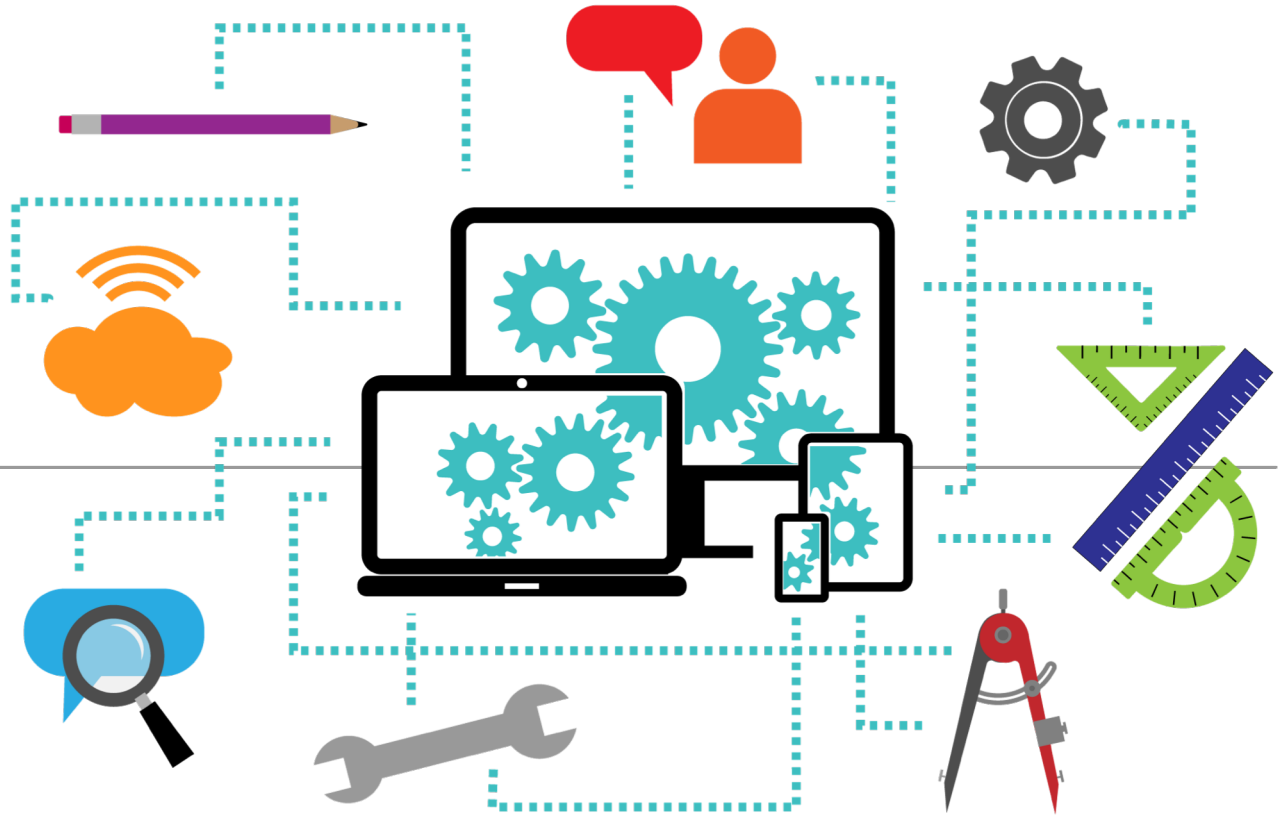
- Deployment Process Should Be:
  - Documented
  - Repeatable
  - Predictable
  - Rehearsed
  - Tools help!

Web Development Stages

6 – Maintenance

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

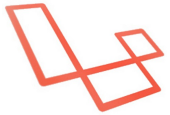
Development Tools & Frameworks




django
Pylons
GRAILS
The Search is over
Microsoft®
.NET
Framework
play!
Flask
web development,
one drop at a time
spring
by Pivotal
Symfony
CakePHP
laravel
mochikit
django
CMS
dojo
toolkit
handlebars
sitecore®
Own the experience™
ember
GRUNT
Knockout.
MOOTOOLS
prototype
jQuery
mobile
Joomla!™
...because open source matters
node
npm
BACKBONE.JS
Magento™
Open Source eCommerce

Categories of Tools & Frameworks: *

Server Side Development



Categories of Tools & Frameworks: *

Frontend Development





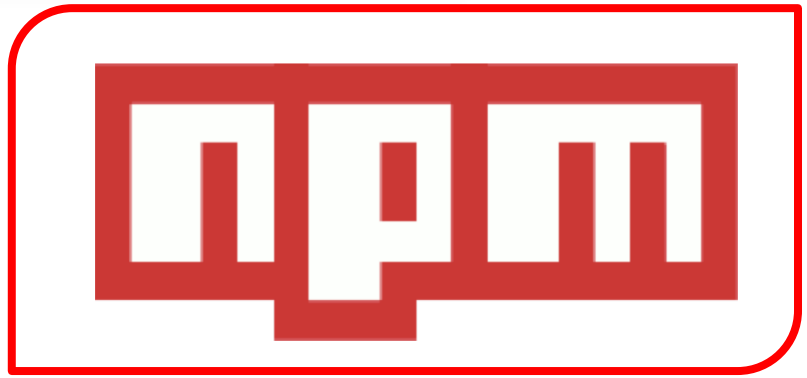

Categories of Tools & Frameworks:

Platforms

Categories of Tools & Frameworks: *

Development Helpers

Bower



jspm.io

Gulp

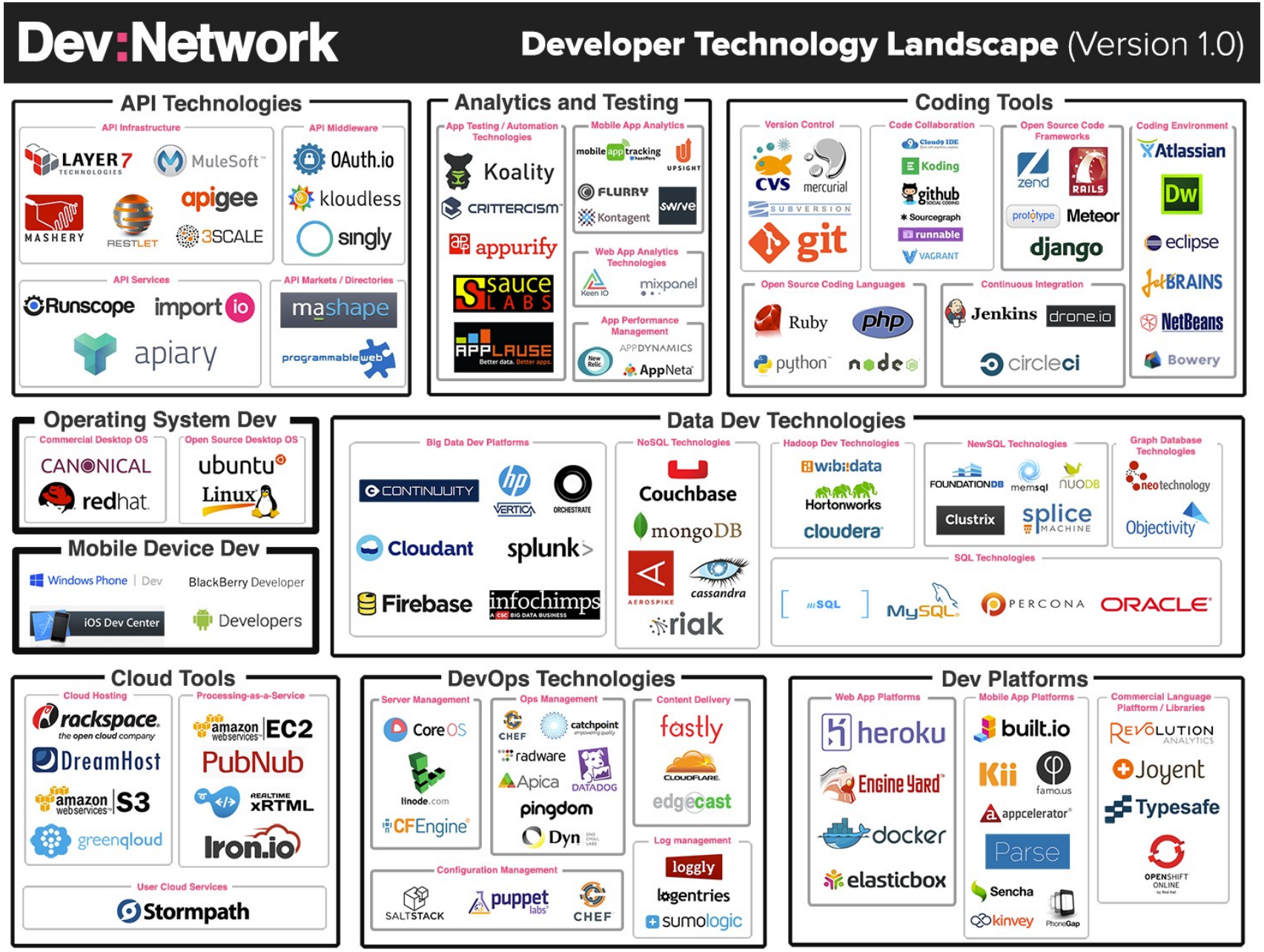
GRUNT

YEOMAN

THE FRONT-END SPECTRUM

- Package Managers
- Front-End Performance
- JS Frameworks
- JS Preprocessors
- Process Automation
- Code Quality
- Build Tools
- Testing
- Back-End

- Core
- Text Editors
- UI Frameworks
- Responsible Web Design
- Templating
- Browser Refreshing
- CSS Preprocessors
- OOCSS & Style Guides
- Version Control


Dev:Network
Developer Technology Landscape (Version 1.0)
API Technologies
API Infrastructure
LAYER 7 TECHNOLOGIES
MuleSoft
MASHERY
RESTLET
apigee
3SCALE
API Middleware
OAuth.io
kloudless
singly
API Services
Runscope
import io
apiary
API Markets / Directories
mashape
programmableweb
Analytics and Testing
App Testing / Automation Technologies
Koality
CRITTERCISM
appurify
Sauce LABS
APPLAUSE
Better data. Better apps.
Mobile App Analytics
mobileapptracking
UPSIGHT
FLURRY
swrve
Kontagent
Web App Analytics Technologies
Keen IO
mixpanel
App Performance Management
New Relic
APPDYNAMICS
AppNeta
Coding Tools
Version Control
CVS
mercurial
SUBVERSION
git
Code Collaboration
Cloud9 IDE
Koding
github
Sourcegraph
runnable
VAGRANT
Open Source Code Frameworks
zend
RAILS
prototype
Meteor
django
Coding Environment
Atlassian
Dw
eclipse
JetBRAINS
NetBeans
Bowery
Open Source Coding Languages
Ruby
php
python
node
Continuous Integration
Jenkins
drone.io
circleci
Operating System Dev
Commercial Desktop OS
CANONICAL
redhat
Open Source Desktop OS
ubuntu
Linux
Mobile Device Dev
Windows Phone | Dev
BlackBerry Developer
iOS Dev Center
Developers
Data Dev Technologies
Big Data Dev Platforms
CONTINUITY
hp VERTICA
ORCHESTRATE
Cloudant
splunk>
Firebase
infochimps
A CSC BIG DATA BUSINESS
NoSQL Technologies
Couchbase
mongoDB
AEROSPIKE
cassandra
riak
Hadoop Dev Technologies
wibidata
Hortonworks
cloudera
NewSQL Technologies
FOUNDATIONDB
memsql
NUODB
Clustrix
splice MACHINE
Graph Database Technologies
neo technology
Objectivity
SQL Technologies
MySQL
PERCONA
ORACLE
Cloud Tools
Cloud Hosting
rackspace the open cloud company
DreamHost
amazon web services S3
greenqloud
Processing-as-a-Service
amazon web services EC2
PubNub
REALTIME xRTML
Iron.io
User Cloud Services
Stormpath
DevOps Technologies
Server Management
CoreOS
linode.com
CFEngine
Ops Management
CHEF
catchpoint
radware
Apica
DATADOG
pingdom
Dyn
Content Delivery
fastly
CLOUDFLARE
edgecast
Configuration Management
SALTSTACK
puppet labs
CHEF
Log management
loggly
logentries
sumologic
Dev Platforms
Web App Platforms
heroku
Engine Yard
docker
elasticbox
Mobile App Platforms
built.io
Kii
famo.us
appcelerator
Parse
Sencha
kinvey
PhoneGap
Commercial Language Platform / Libraries
REVOLUTION ANALYTICS
Joyent
Typesafe
OPENSHIFT ONLINE

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

Models
(database, document)

Services
(API, Authentication, Caching, Serialization)

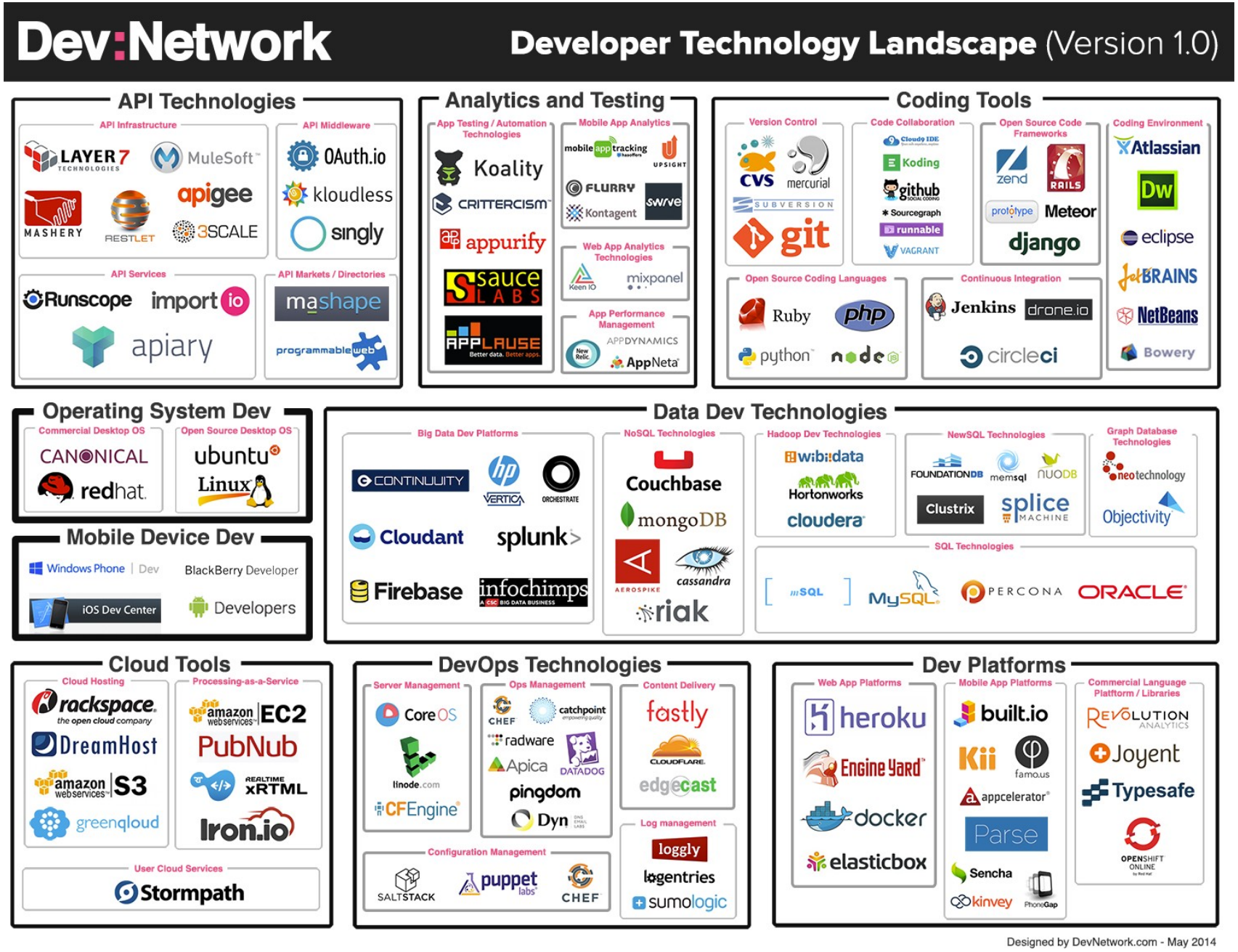
Business Logic
(controllers, routers)

View Layer
(code to render HTML)

Models
(client side models)

Presentation
(HTML, CSS, Responsive)

Local Storage
(HTML5)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Runscope
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apiary
API Markets / Directories
mashape
programmableweb
Analytics and Testing
App Testing / Automation Technologies
Koality
CRITTERCISM
appurify
SAUCE LABS
APPLAUSE
Better data. Better apps.
Mobile App Analytics
mobile app tracking
UPSIGHT
FLURRY
swrve
Kontagent
Web App Analytics Technologies
Keen IO
mixpanel
App Performance Management
New Relic
APPDYNAMICS
AppNeta
Coding Tools
Version Control
CVS
mercurial
SUBVERSION
git
Code Collaboration
Cloud9 IDE
Koding
github
Sourcegraph
runnable
VAGRANT
Open Source Code Frameworks
zend
RAILS
prototype
Meteor
django
Coding Environment
Atlassian
Dw
eclipse
JetBRAINS
NetBeans
Bowery
Open Source Coding Languages
Ruby
php
python
node
Continuous Integration
Jenkins
drone.io
circleci
Operating System Dev
Commercial Desktop OS
CANONICAL
redhat
Open Source Desktop OS
ubuntu
Linux
Mobile Device Dev
Windows Phone | Dev
BlackBerry Developer
iOS Dev Center
Developers
Data Dev Technologies
Big Data Dev Platforms
CONTINUITY
hp VERTICA
ORCHESTRATE
Cloudant
splunk>
Firebase
infochimps
A CSC BIG DATA BUSINESS
NoSQL Technologies
Couchbase
mongoDB
AEROSPIKE
cassandra
riak
Hadoop Dev Technologies
wibidata
Hortonworks
cloudera
NewSQL Technologies
FOUNDATIONDB
memsql
NUODB
Clustrix
splice MACHINE
Graph Database Technologies
neo technology
Objectivity
SQL Technologies
MySQL
PERCONA
ORACLE
Cloud Tools
Cloud Hosting
rackspace the open cloud company
DreamHost
amazon web services S3
greenqloud
Processing-as-a-Service
amazon web services EC2
PubNub
REALTIME xRTML
Iron.io
User Cloud Services
Stormpath
DevOps Technologies
Server Management
CoreOS
linode.com
CFEngine
Ops Management
CHEF
catchpoint
radware
Apica
DATADOG
pingdom
Dyn
Content Delivery
fastly
CLOUDFLARE
edgecast
Configuration Management
SALTSTACK
puppet labs
CHEF
Log management
loggly
logentries
sumologic
Dev Platforms
Web App Platforms
heroku
Engine Yard
docker
elasticbox
Mobile App Platforms
built.io
Kii
famo.us
appcelerator
Parse
Sencha
kinvey
PhoneGap
Commercial Language Platform / Libraries
REVOLUTION ANALYTICS
Joyent
Typesafe
OPENSHIFT ONLINE
Designed by DevNetwork.com - May 2014

References

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

Questions?