HELLO!

I am Sang Bui

I am here because I want to learn

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S: thanhsang.skype

W: sangbui.com

L: https://vn.linkedin.com/in/buithanhsang

1. BROWSER ARCHITECTURE

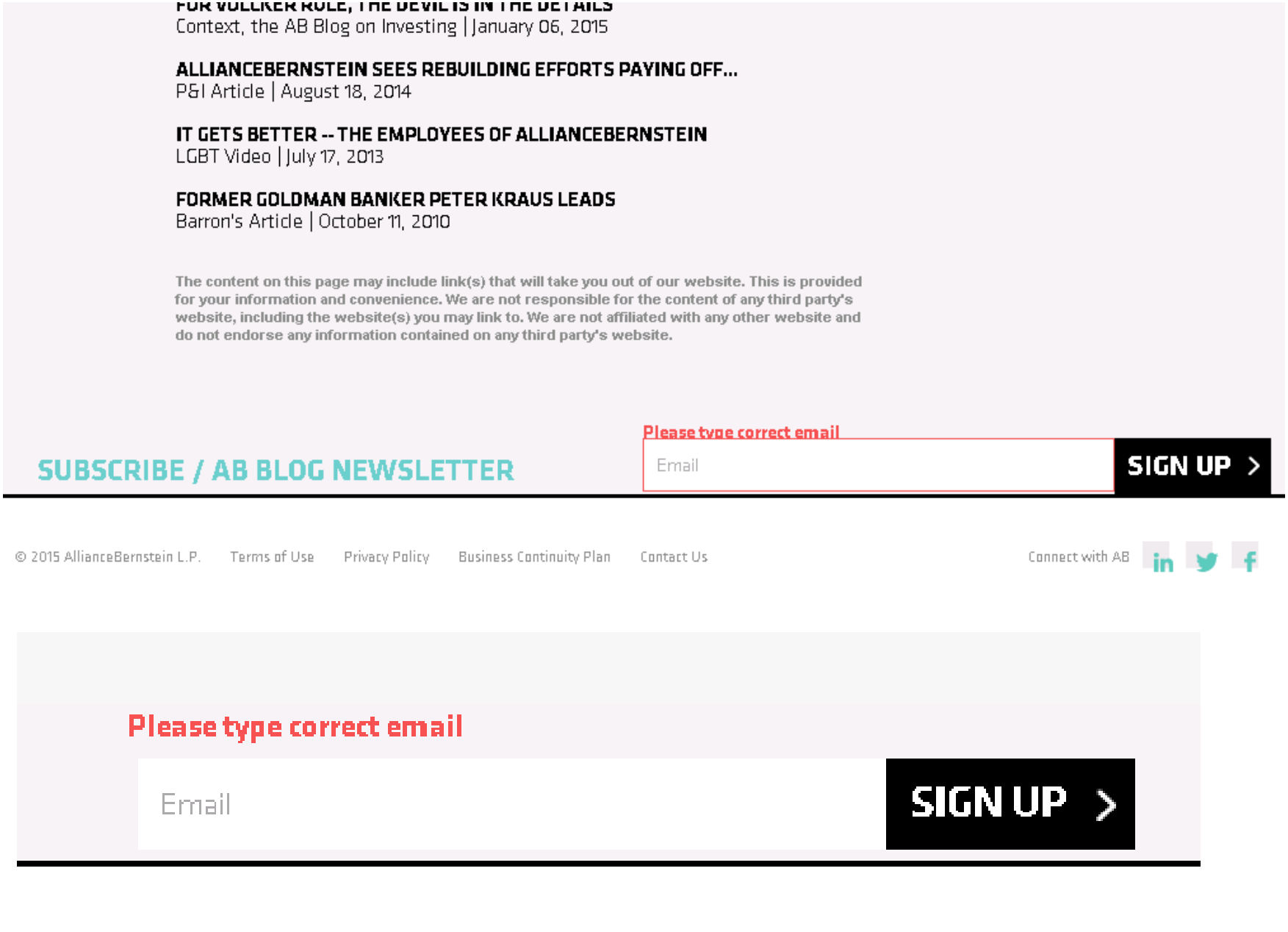
2. CROSS BROWSER TESTING

3. CLIENT SIDE BYPASS TESTING

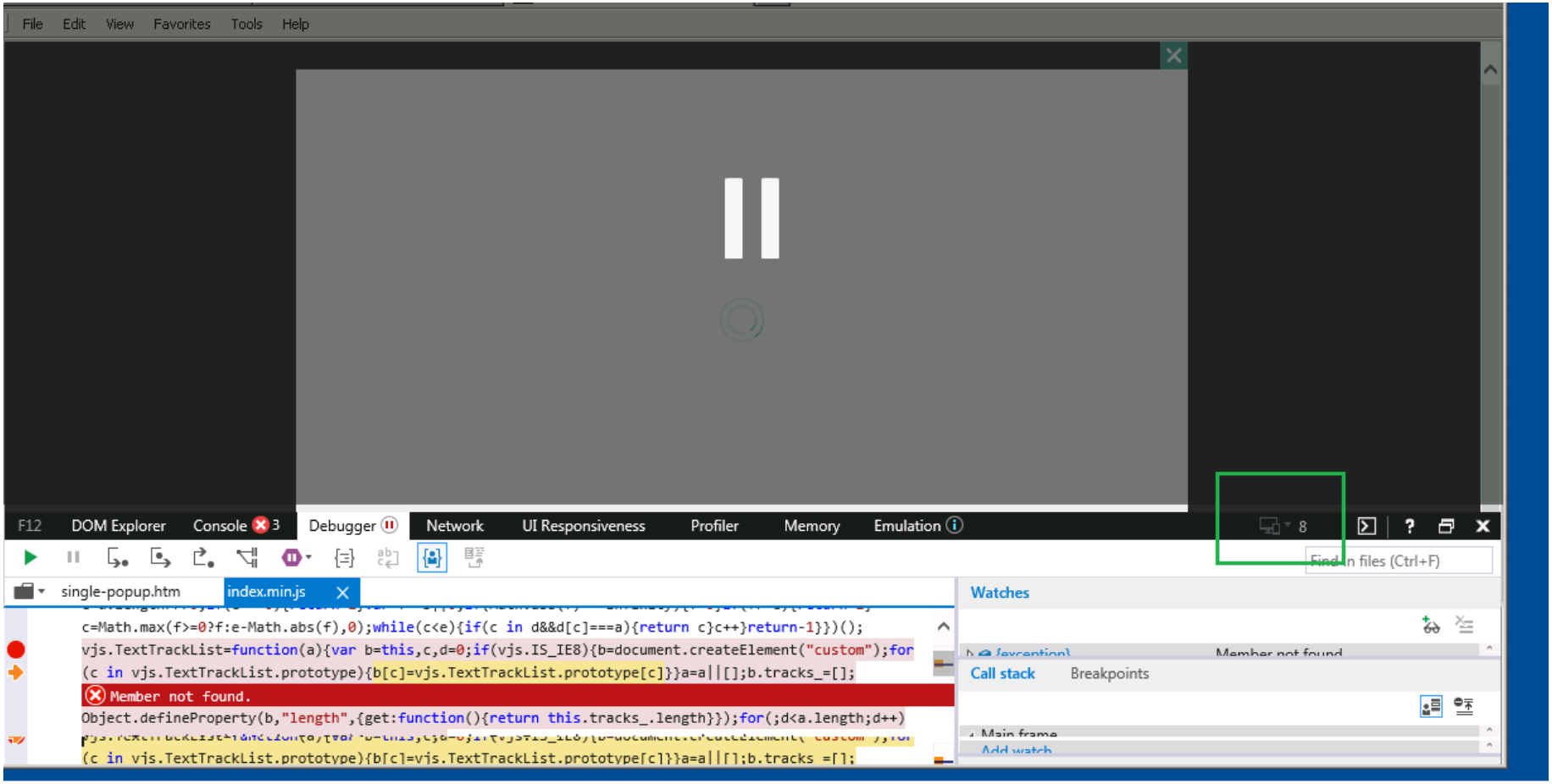
ABOUT MY CURRENT PROJECT

“Testing multiple browsers on multiple platforms”

LAYOUT DEFECT



FUNCTION DEFECT



FUNCTION DEFECT

https://www.linkedin.com/shareArticle?mini=true&url=https%3a%2f%2fwww.abglobal.com%2fdefined-contribution%2fus%2finside-the-minds-of-plan-participant.htm&title=I took AB's Investor Survey and found out I am a CAPABLE, CONFIDENT INVESTOR&summary=AB queried over 1,000 US workers to help understand their behavior and attitude toward investing for retirement. Some of the results were surprising. Take the survey yourself and find out what type of investor you are.

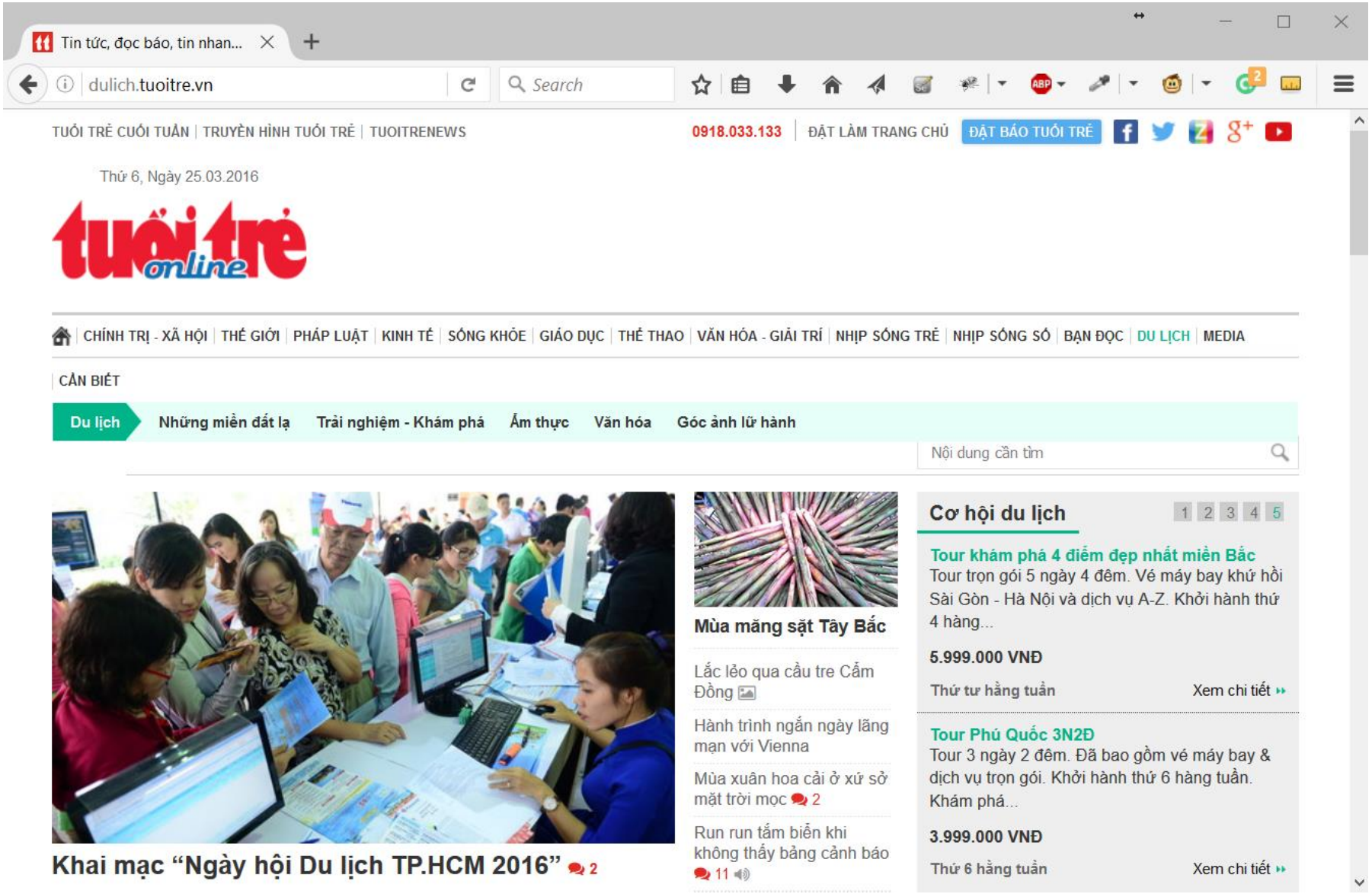
WHAT IS THE DIFFERENCE BETWEEN THESE BROWSERS?

BROWSER ARCHITECTURE

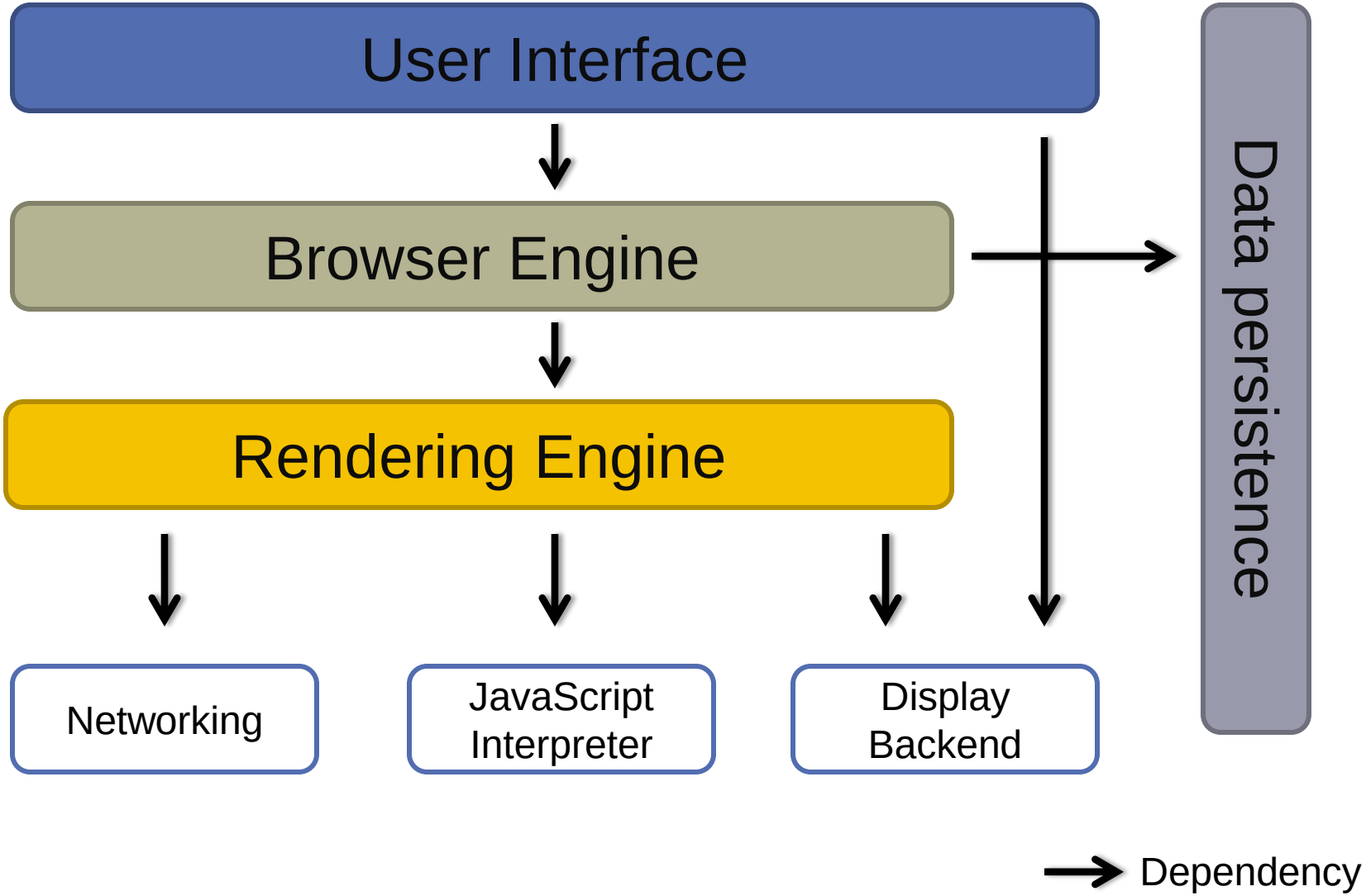
WHAT'S THE BROWSER?

The browser main functionality is to present the web resource you choose, by requesting it from the server and displaying it on the browser window. The resource format is usually HTML but also PDF, image and more.

WHAT'S THE BROWSER?



BROWSER ARCHITECTURE

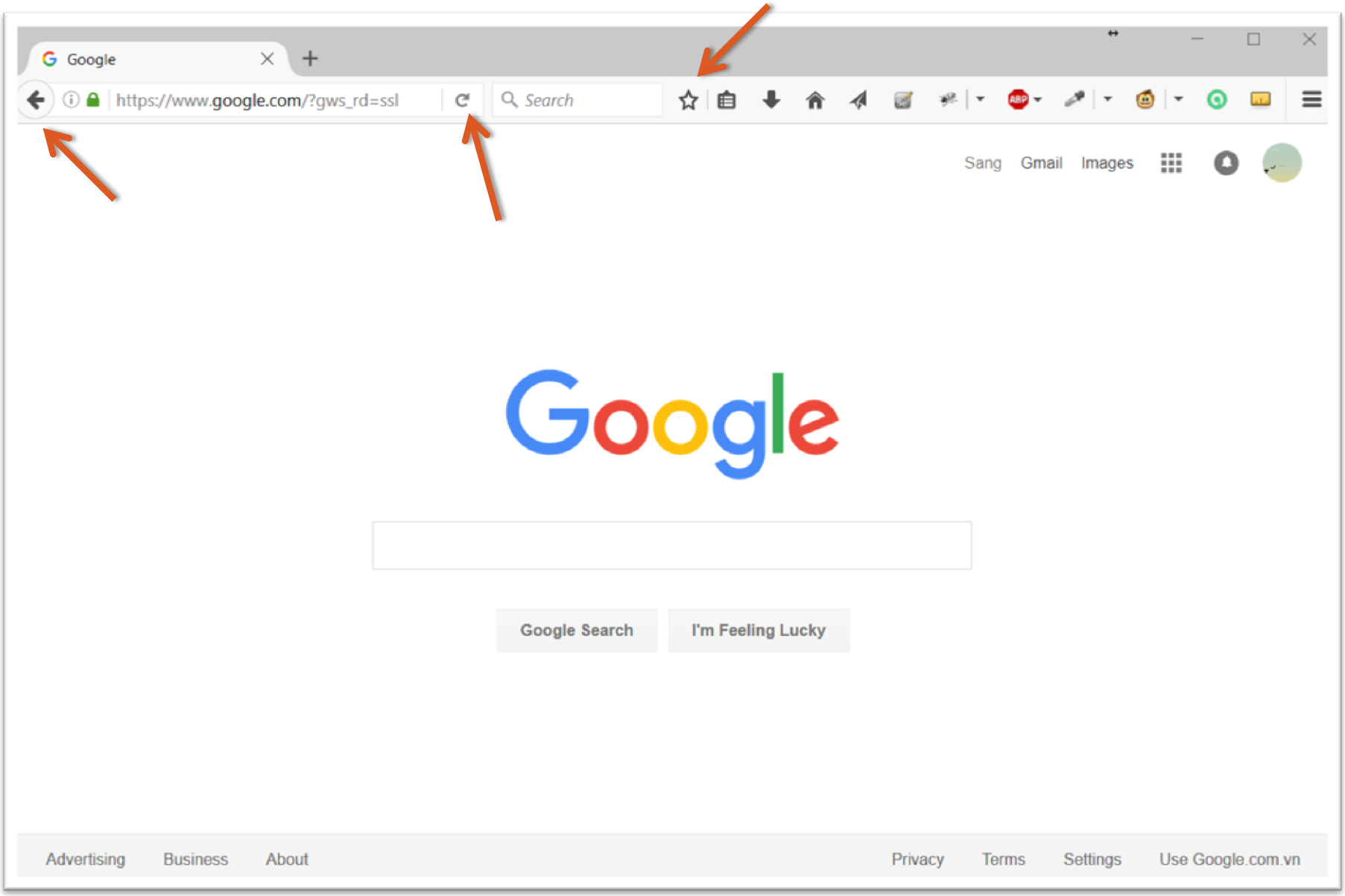


USER INTERFACE

The space where interaction between users and the browser.

Most of the browsers have common inputs for user interface:

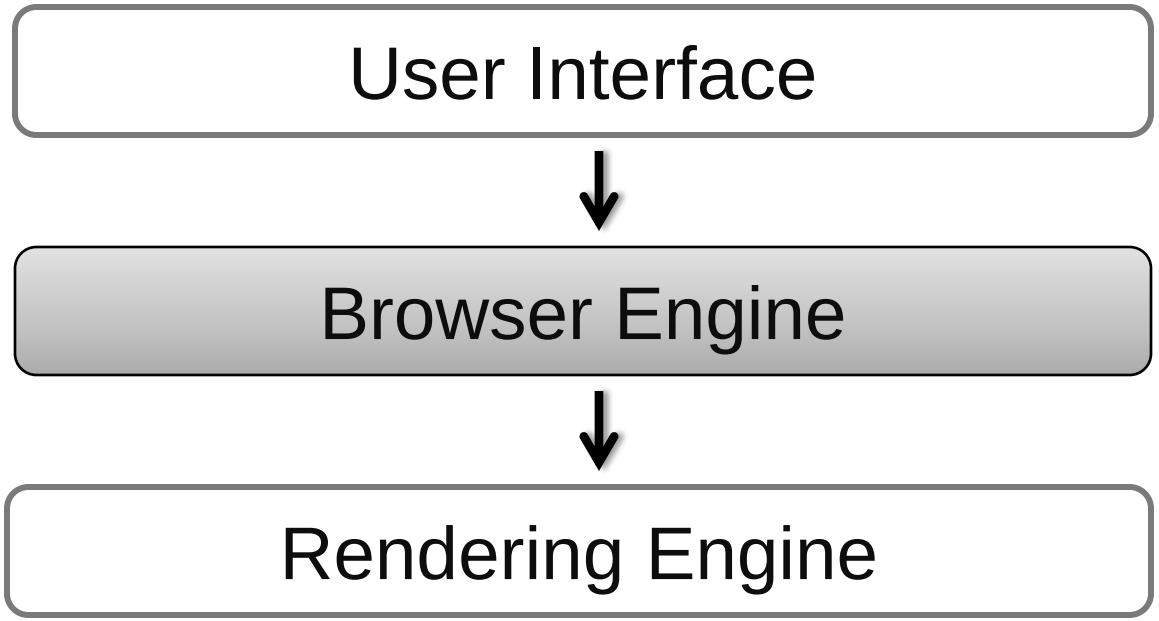
- Address bar.
- Next and back buttons.
- Buttons for home, refresh and stop
- Bookmark web pages
- …etc.


Google
https://www.google.com/?gws_rd=ssl
Search
Sang
Gmail
Images
Google
Google Search
I'm Feeling Lucky
Advertising
Business
About
Privacy
Terms
Settings
Use Google.com.vn

BROWSER ENGINE

The bridge between

User Interface & Rendering Engine



BROWSER ENGINE

Browser Engine provides methods to begin the loading of URL and other high-level browsing actions.

- Reload, Back, Forward actions

- Error messages

- Loading progress

RENDERING ENGINE

Rendering Engine interprets (render) the HTML, XML, JavaScript and generates the layout that is displayed in the User Interface.

Key component of this phase is HTML, CSS parse.

This is a reasons why the browser display a website so difference.

NETWORKING

Access and transfer data on the internet (calls HTTP, HTTPS, FTP).

The Networking components handles all aspects of internet communication or security.

JAVASCRIPT INTERPRETER

Component parse & executes the JavaScript that is embedded in the website.

Results of the execution a passed to the Rendering Engines for display.

DISPLAY BACKEND

Display common UI components.

Drawing basic widgets like combo boxes, windows.

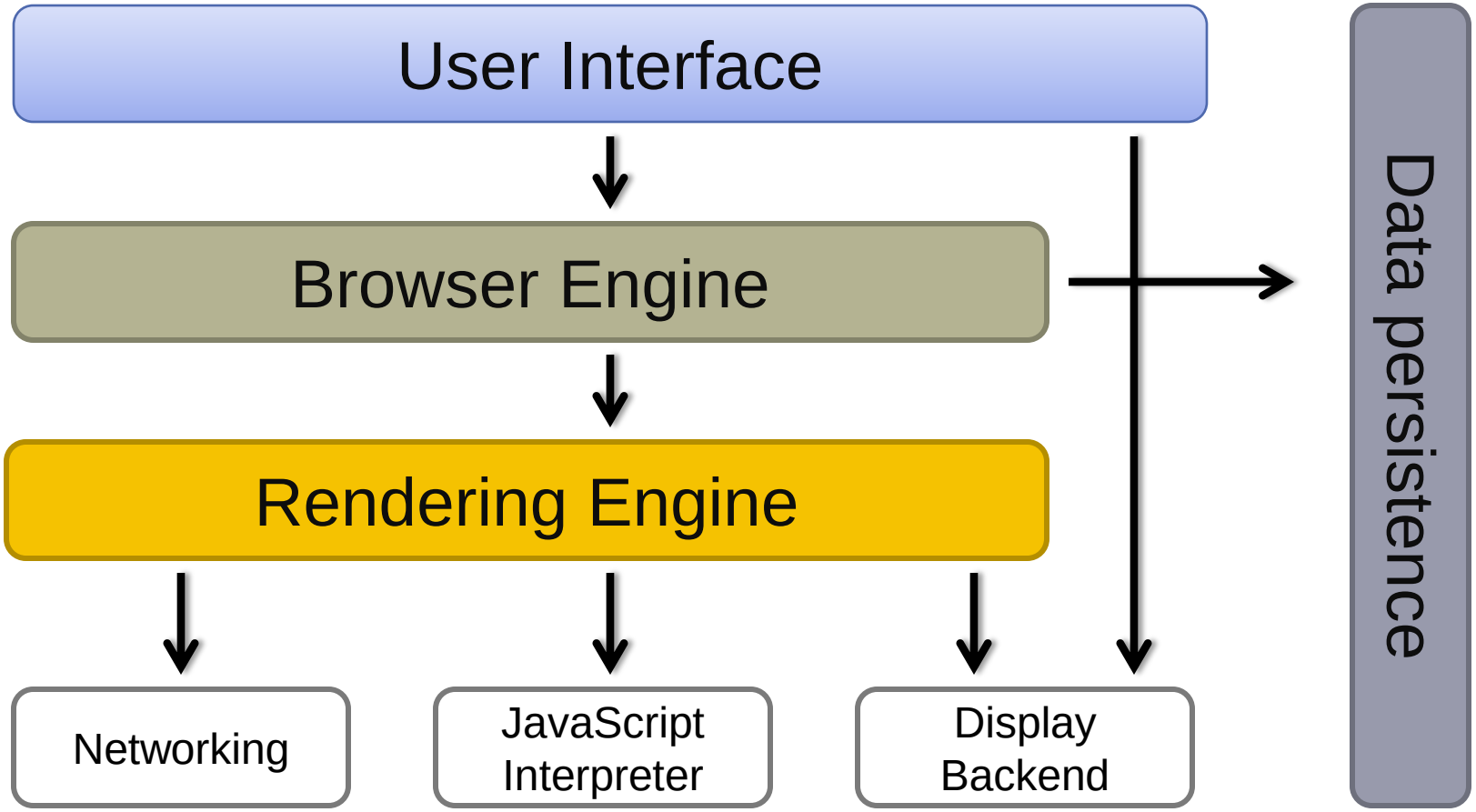
DATA PERSISTENCE

Storing the data on the client side.

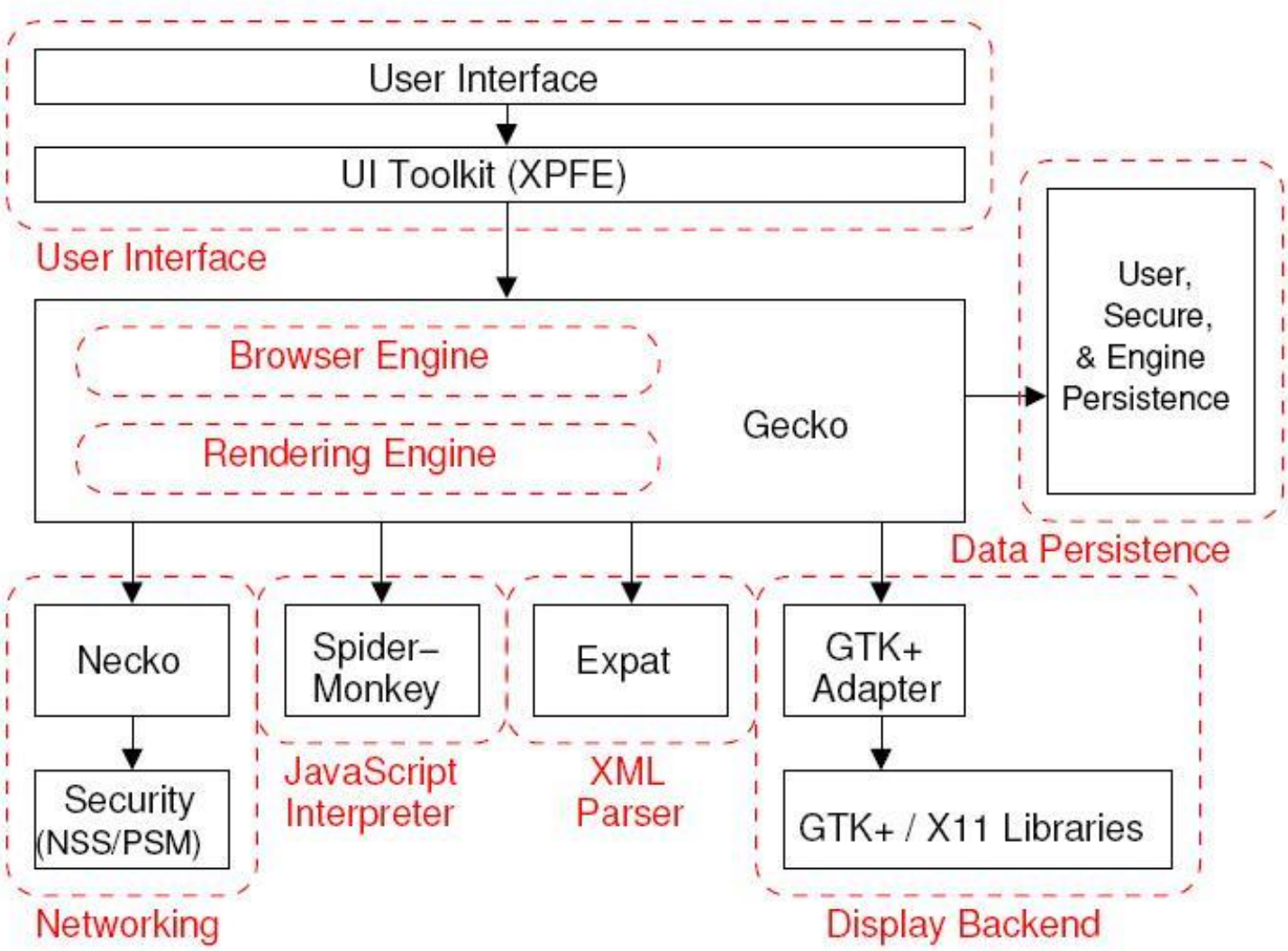
- Cookies.

- Cache.

LOOK BACK AGAIN!



FIREFOX ARCHITECTURE



CHROME'S ARCHITECTURE

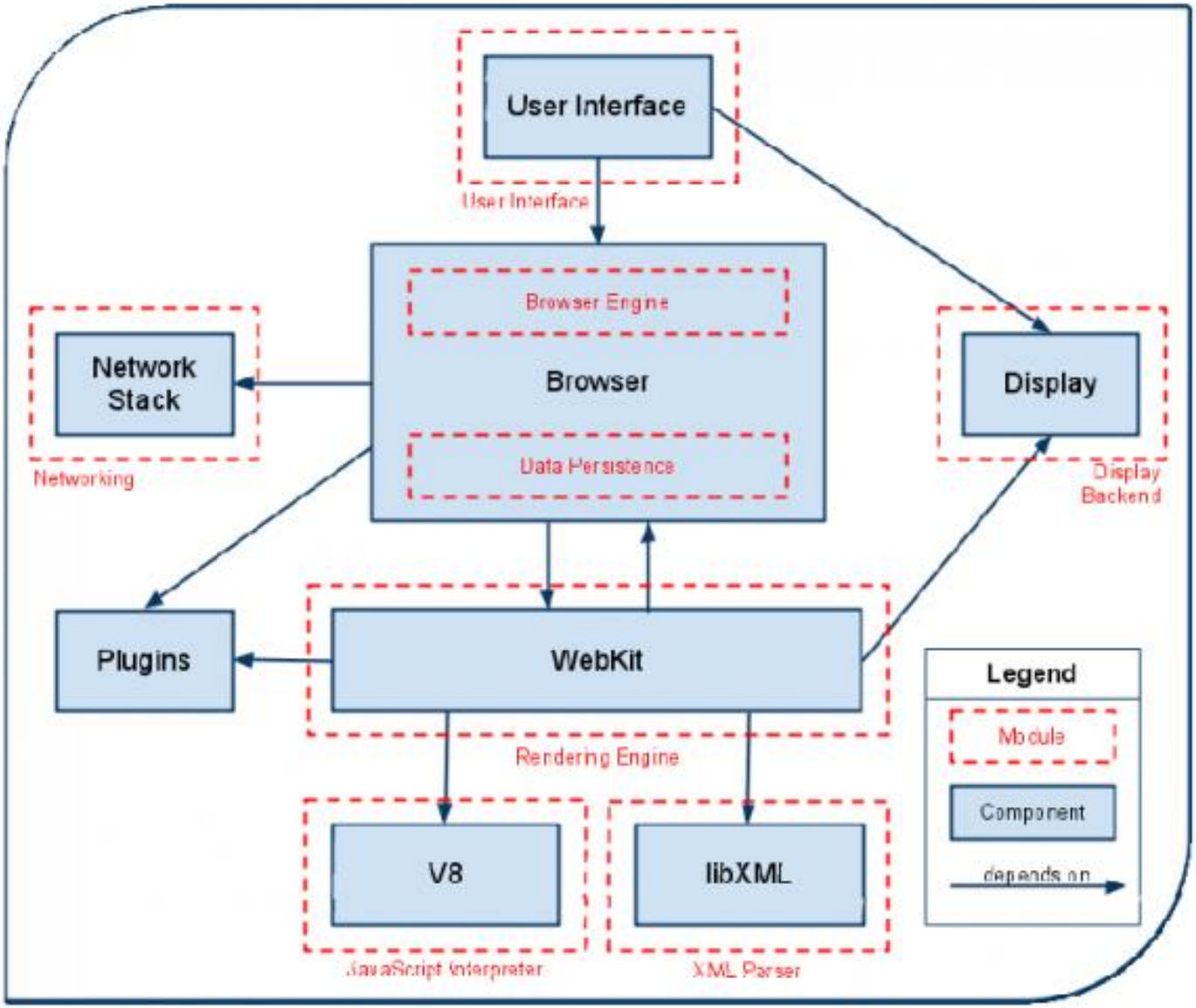
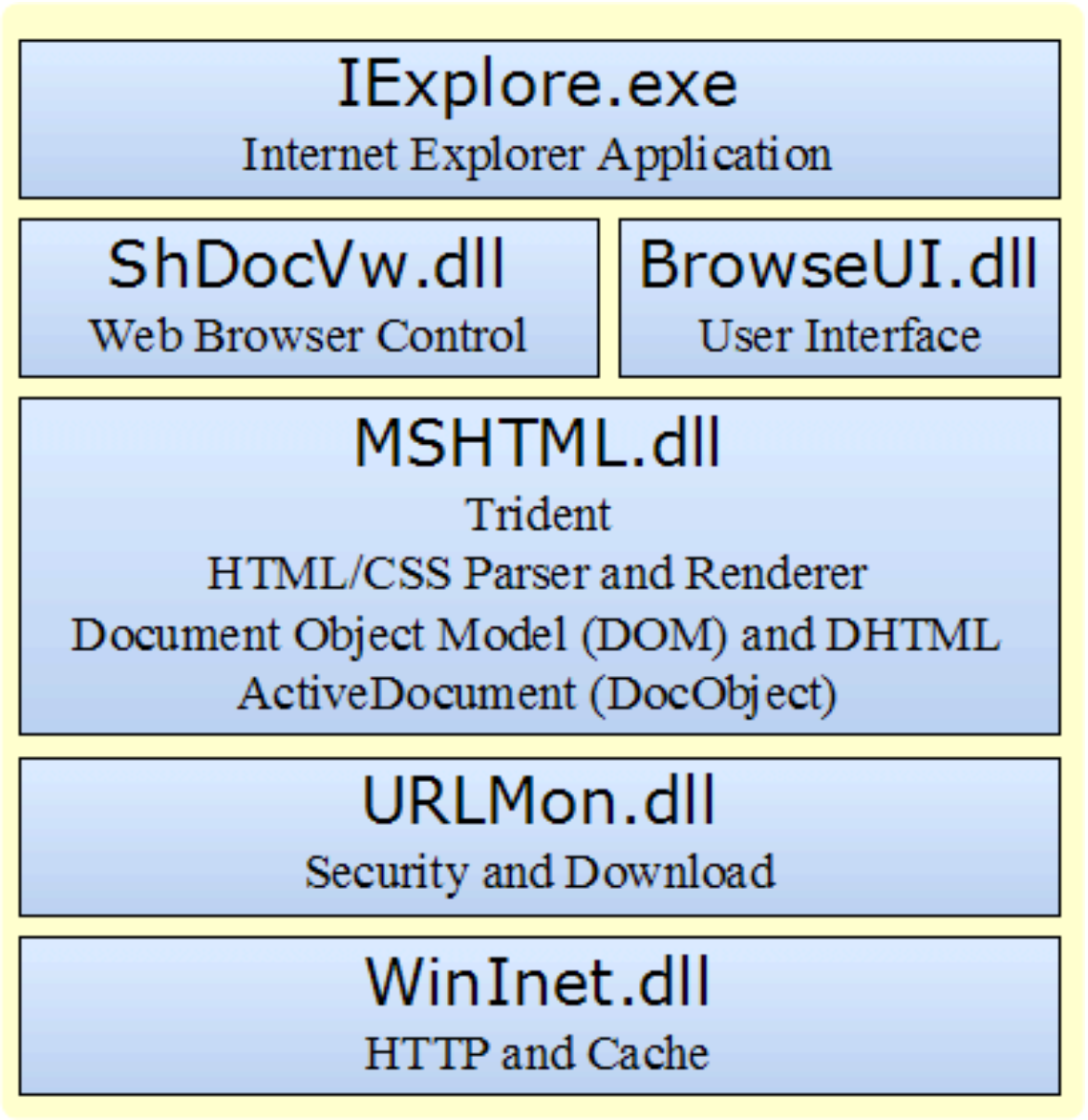


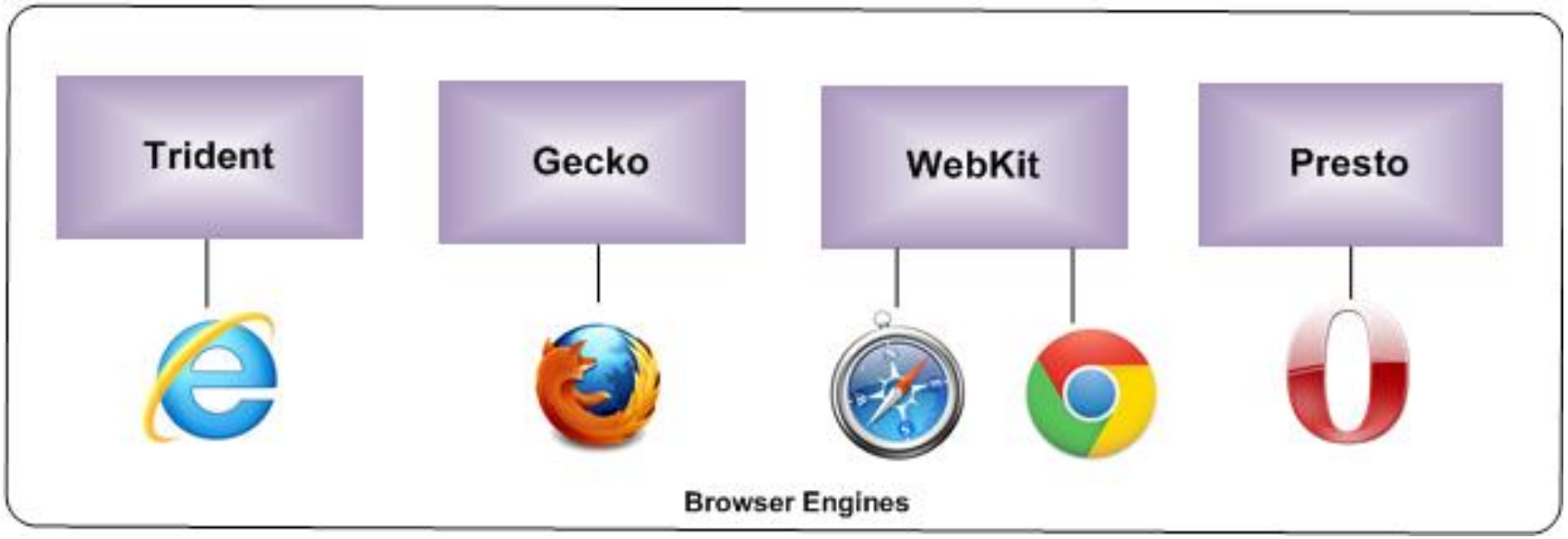
Figure 1 - Our derived conceptual architecture of Google Chrome

IE ARCHITECTURE



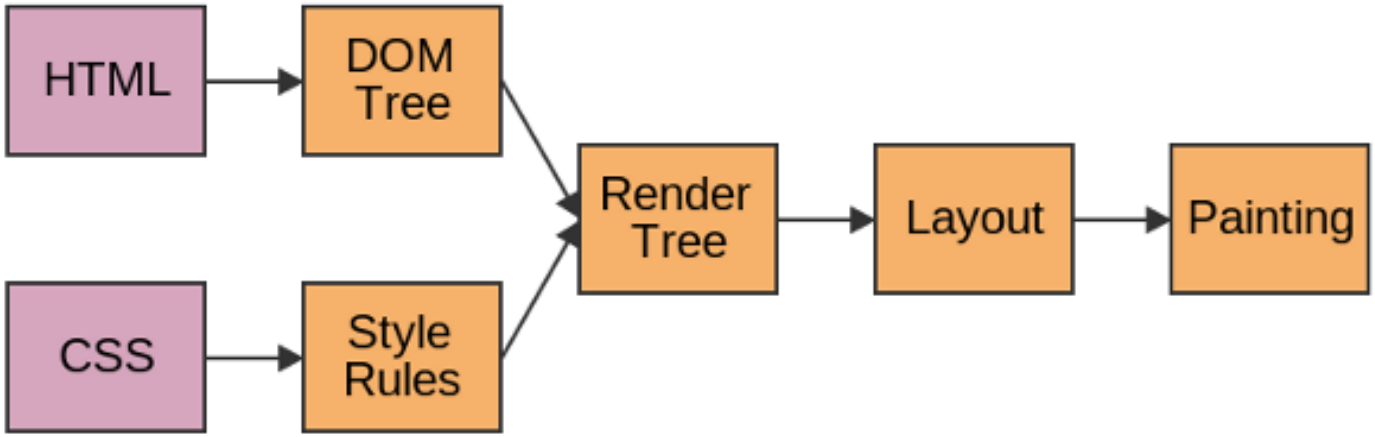
THE RENDERING ENGINE

Different browser use different rendering engines



THE BASIC FLOW OF RENDERING ENGINE

1. Parsing HTML to construct the DOM
2. Render tree construction
3. Layout of the render tree
4. Paint the render tree



1. HTML PARSER DOINGS

Parses input HTML tag

Fixes developer mistakes

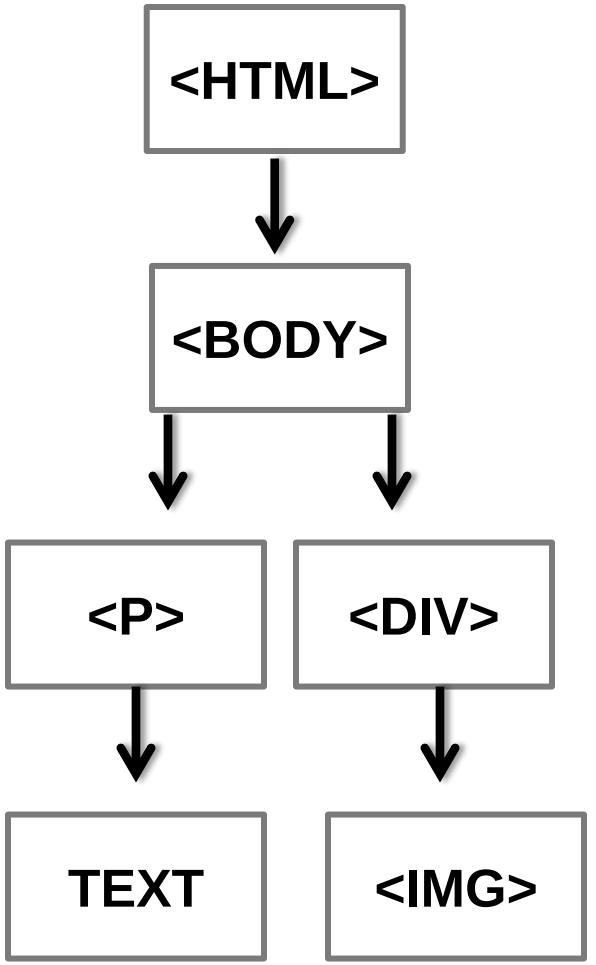
Request to load resource

Constructs DOM tree

HTML PARSER DOINGS

```
<!DOCTYPE html>
<html>
    <body>
        <p>SangBui Website</p>
        <div>
            <img src="home.jpg"/>
        </div>
    </body>
</html>
```

```
<!DOCTYPE html>
<html>
    <body>
        <p>SangBui Website</p>
        <div>
            <img src="home.jpg"/>
        </div>
    </body>
</html>
```

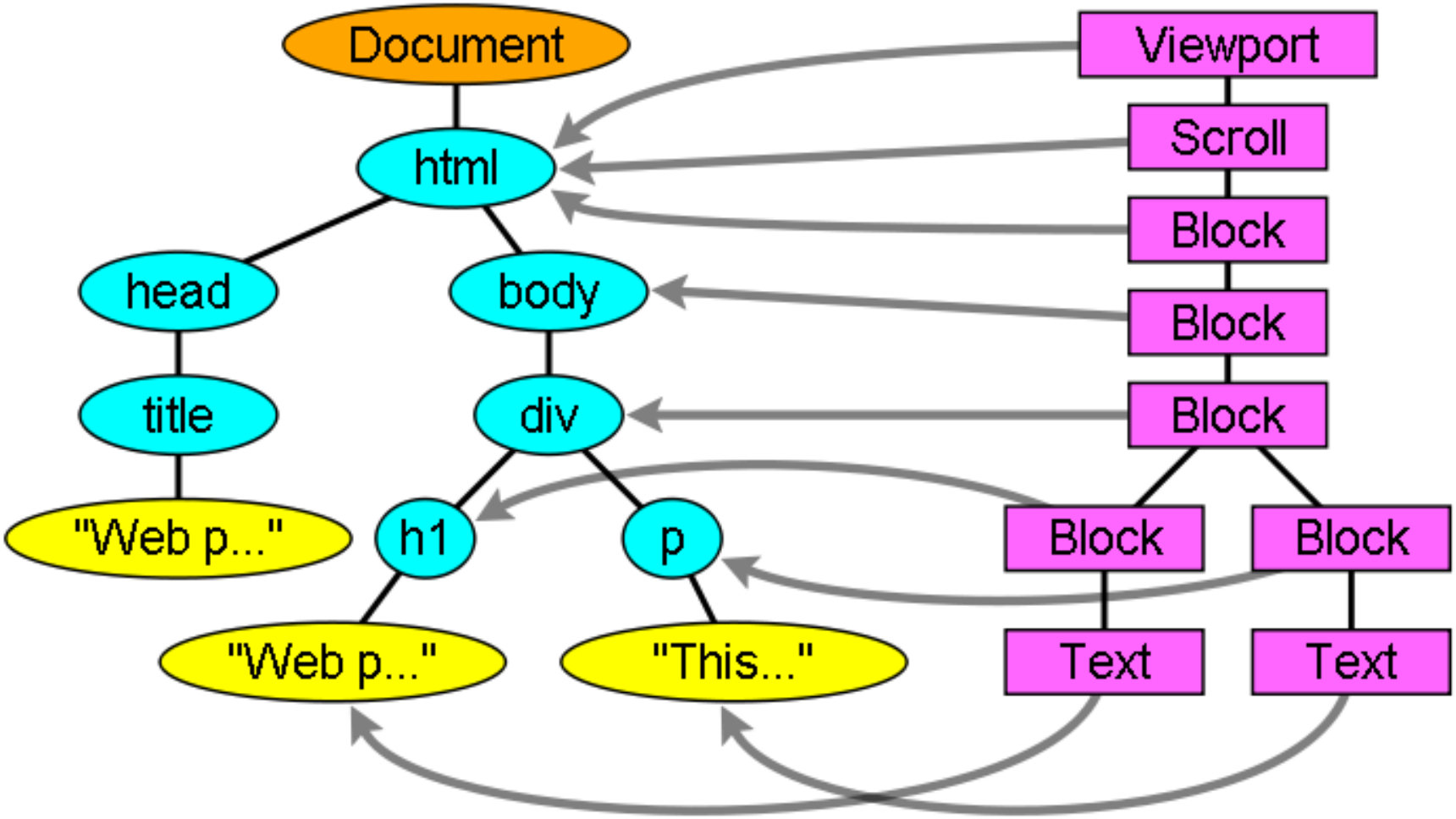


Parsing HTML to construct the DOM

2. RENDER TREE CONSTRUCTION

- Tree of visual elements in display order.
- Style information, computed metrics
- Shadow DOM tree

RENDER TREE CONSTRUCTION



3. LAYOUT THE RENDER TREE

What is Layout process?

- Calculation of geometry and position
- Flow based model (left-to-right, top-to-bottom)
- Coordinate system relative to top left coordinates

4. PAINTING

Go through the tree from the root

Global and Incremental paint

Painting order (CSS2):

– background colour

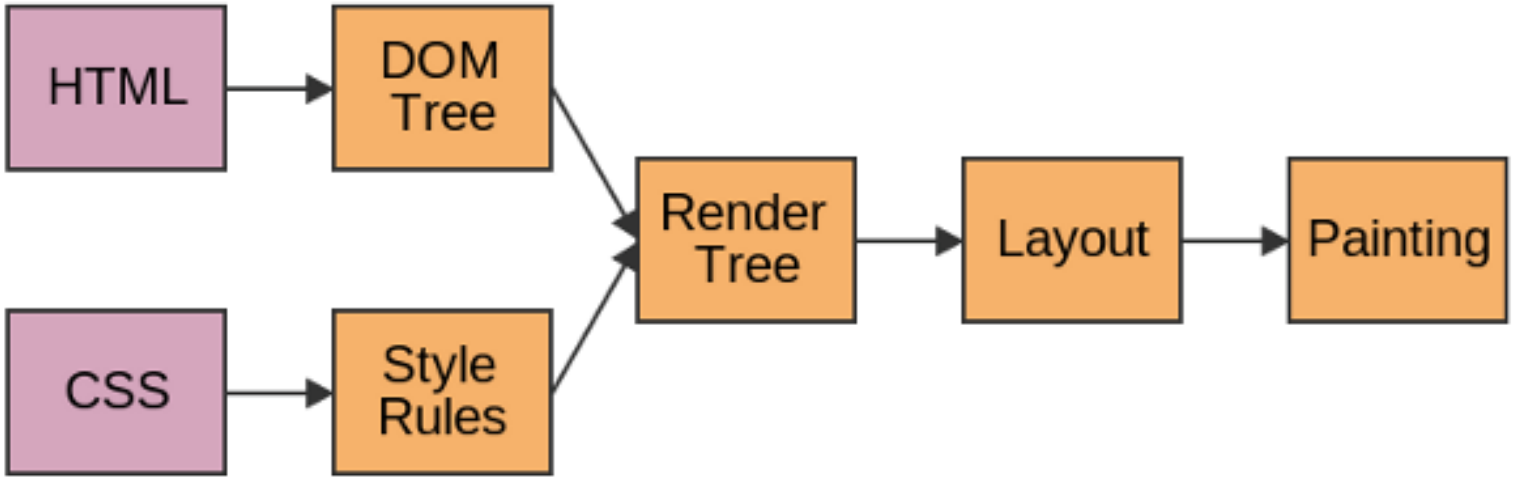
– background image

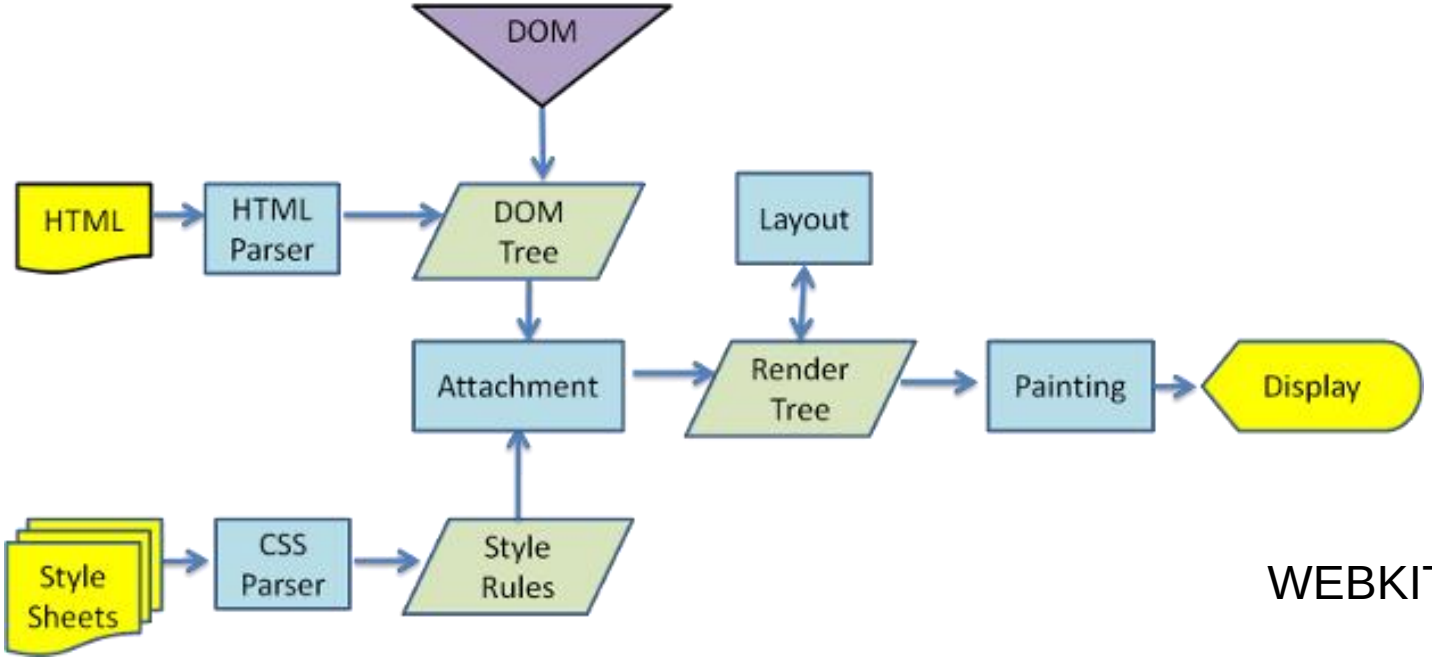
– border

– …

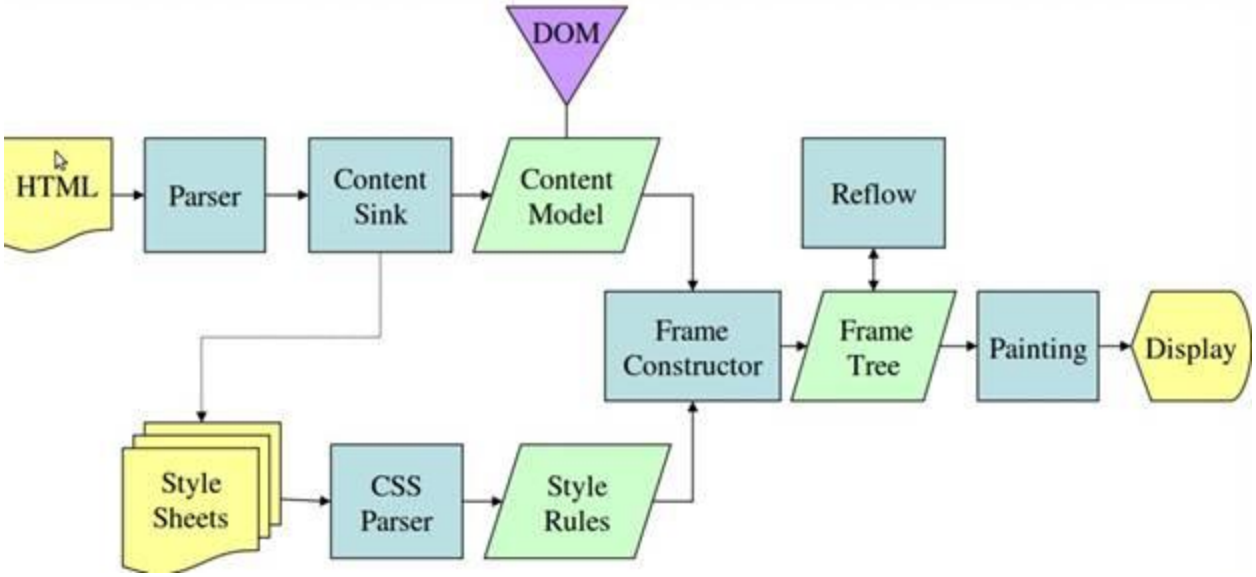
Changes style will cause restyle and repaint of the element. Changes of position will cause re-layout and repaint.

LOOK BACK THE BASIC FLOW!





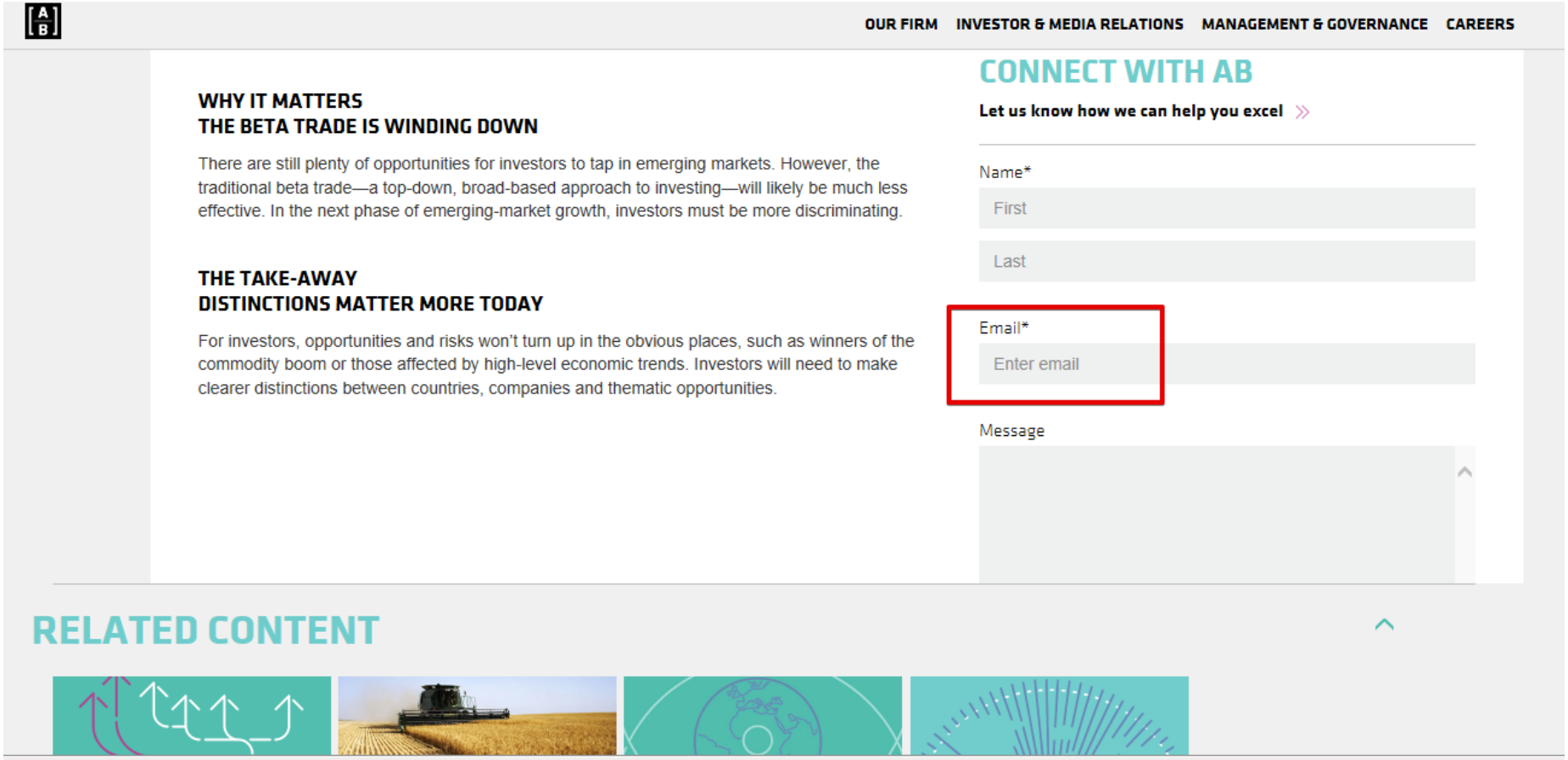
WEBKIT main flow



Mozilla's Gecko

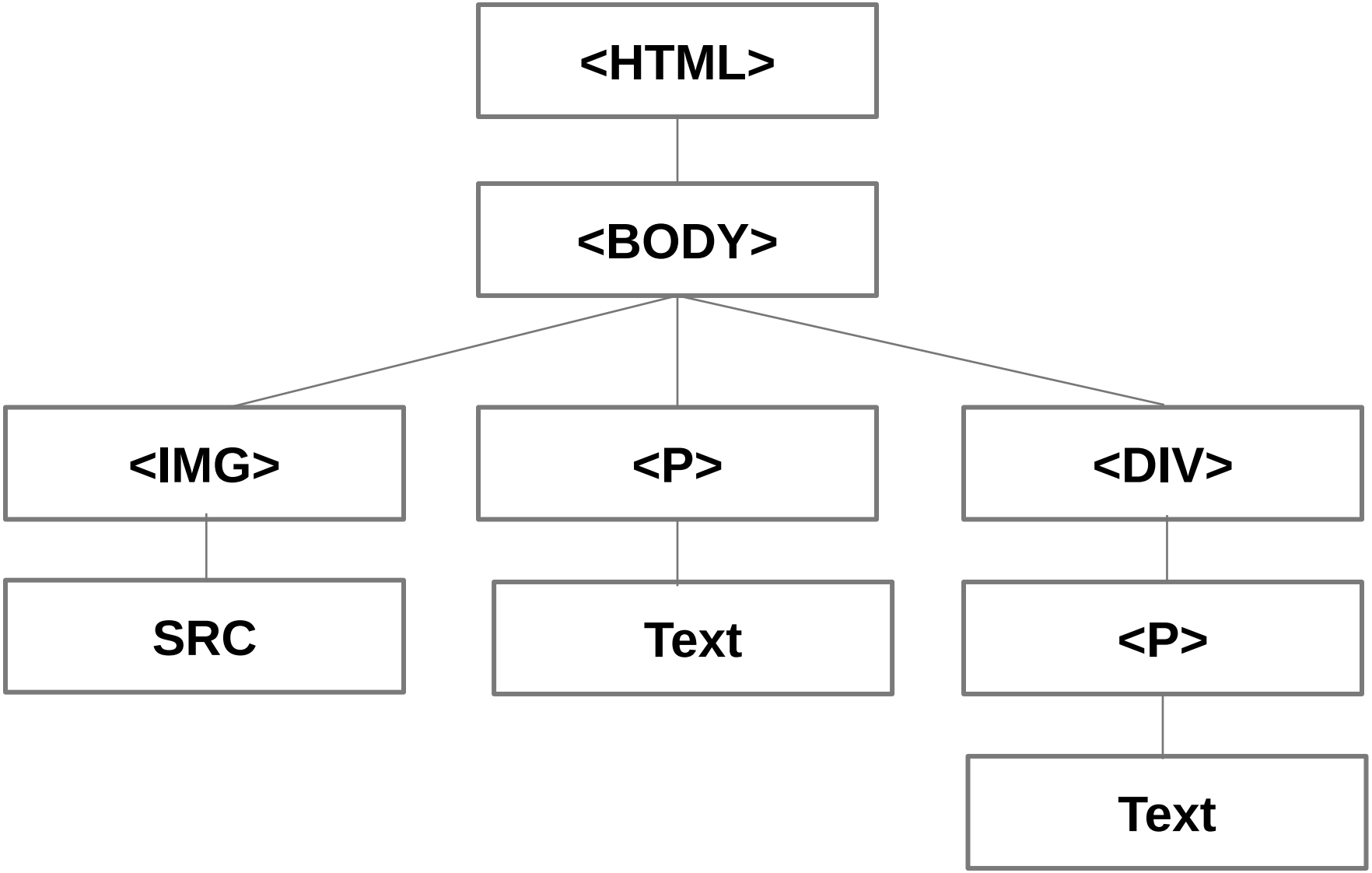
DIFFERENT BROWSER USE DIFFERENT RENDERING ENGINES IN DIFFERENT WAYS

QUIZ


OUR FIRM
INVESTOR & MEDIA RELATIONS
MANAGEMENT & GOVERNANCE
CAREERS
WHY IT MATTERS
THE BETA TRADE IS WINDING DOWN
There are still plenty of opportunities for investors to tap in emerging markets. However, the traditional beta trade—a top-down, broad-based approach to investing—will likely be much less effective. In the next phase of emerging-market growth, investors must be more discriminating.
THE TAKE-AWAY
DISTINCTIONS MATTER MORE TODAY
For investors, opportunities and risks won't turn up in the obvious places, such as winners of the commodity boom or those affected by high-level economic trends. Investors will need to make clearer distinctions between countries, companies and thematic opportunities.
CONNECT WITH AB
Let us know how we can help you excel
Name*
First
Last
Email*
Enter email
Message
RELATED CONTENT

PARSING HTML TO CONSTRUCT THE DOM

```
<!DOCTYPE html>
<html>
    <body>
        <img src="home.jpg"/>
        <p>TVNClub</p>
        <div>
            <p>Browser Architecture</p>
        </div>
    </body>
</html>
```


<HTML>
<BODY>
<IMG>
<P>
<DIV>
SRC
Text
<P>
Text

CROSSING BROWSER TESTING

• Cross browser testing is a process to test the web application across multiple browsers.

• Check compatibility of web in multiple browsers & make sure that web application works correctly.

• Involves testing both client side and server side behavior of application.

TEST THE WEB APPLICATION ACROSS MULTIPLE BROWSERS?

EXHAUSTIVE TESTING

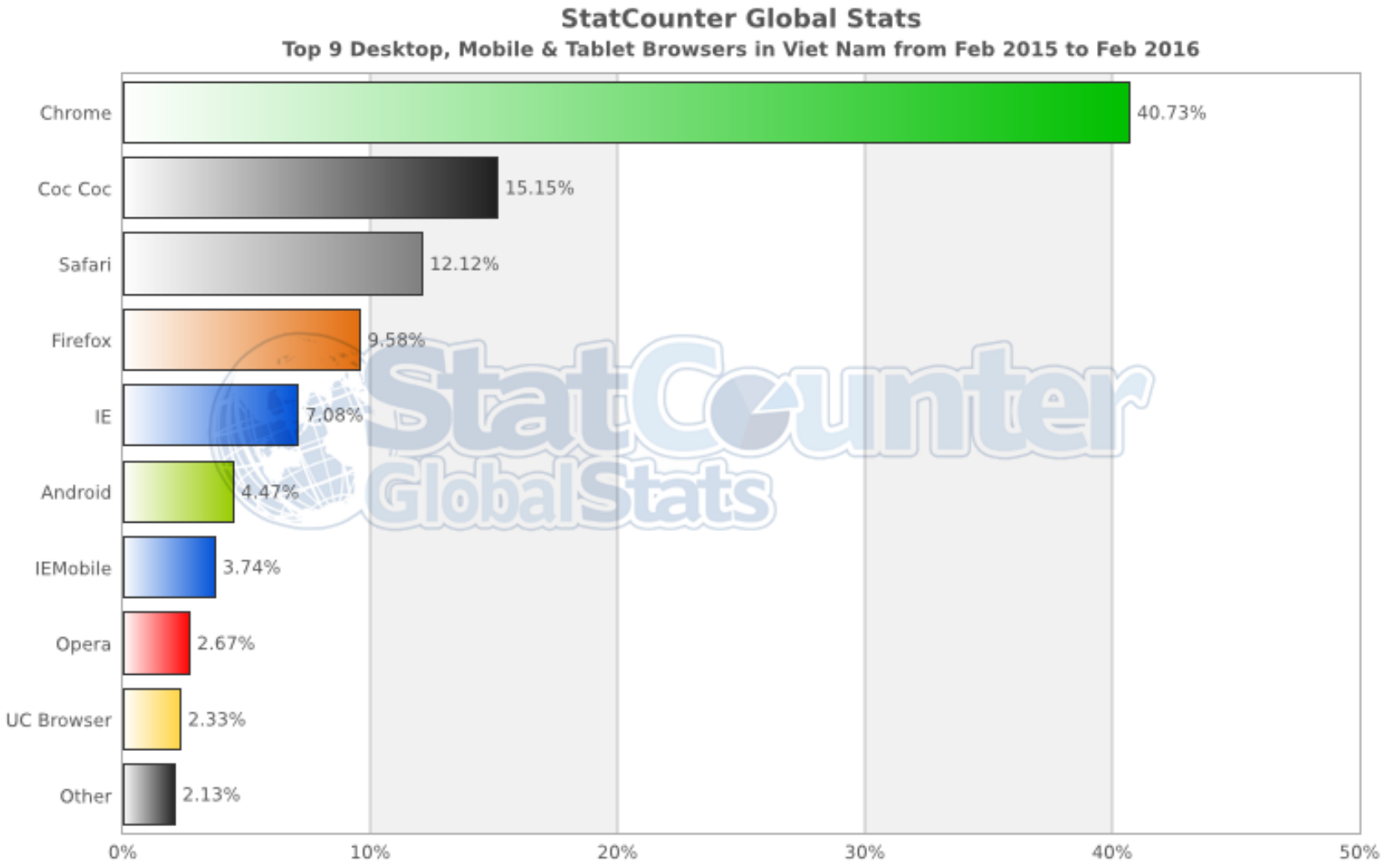
Exhaustive Testing (Test everything) is Impossible.

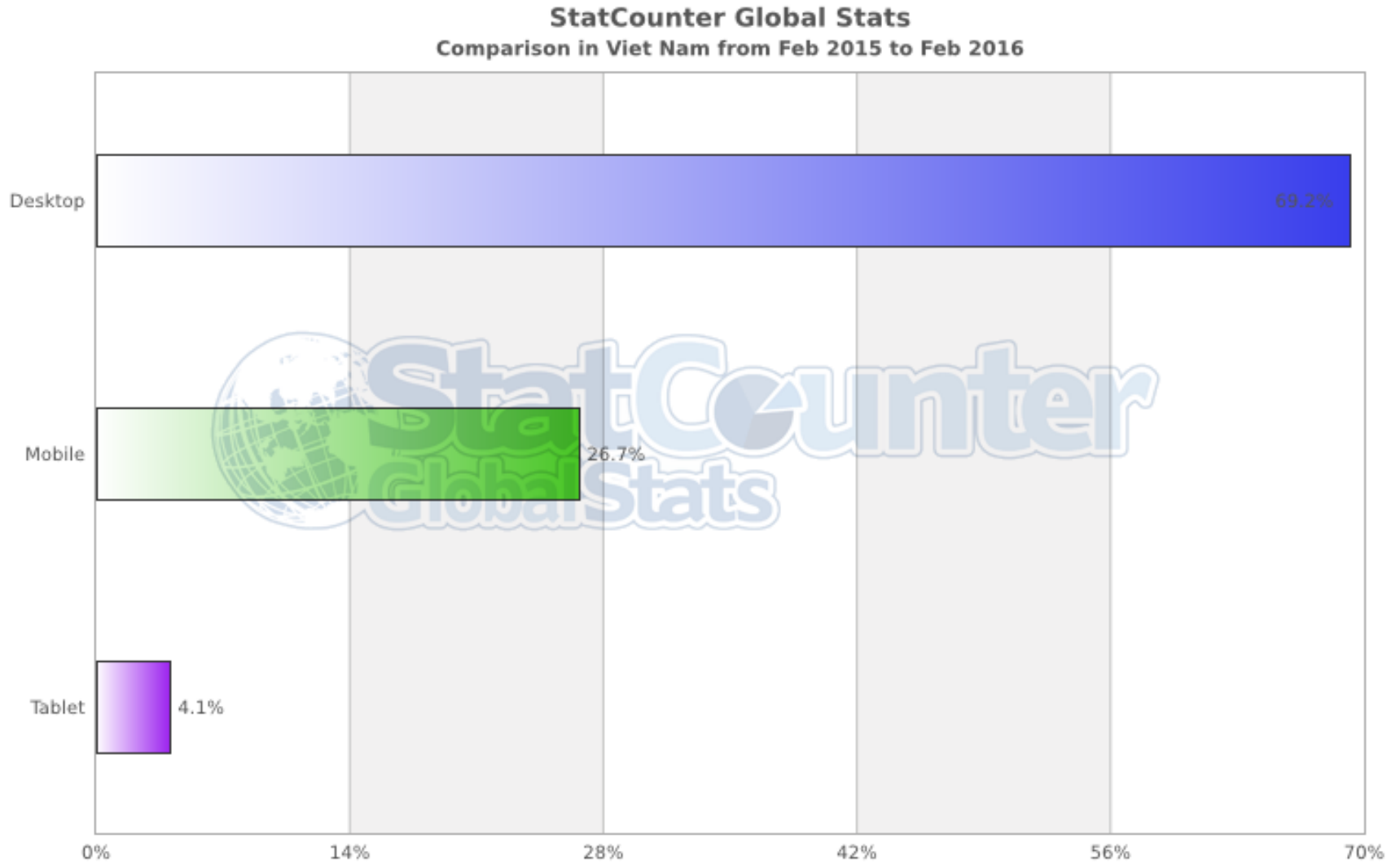
Instead of exhaustive testing, Risk analysis and Priorities should be used to focus testing efforts.

Based on:

- **Know your audience**
- **Decide the platform you will support**
- **How much you can test**
- **Trending**

TRENDING


StatCounter Global Stats
Top 9 Desktop, Mobile & Tablet Browsers in Viet Nam from Feb 2015 to Feb 2016
Chrome
40.73%
Coc Coc
15.15%
Safari
12.12%
Firefox
9.58%
IE
7.08%
Android
4.47%
IEMobile
3.74%
Opera
2.67%
UC Browser
2.33%
Other
2.13%
0%
10%
20%
30%
40%
50%
StatCounter
GlobalStats


StatCounter Global Stats
Comparison in Viet Nam from Feb 2015 to Feb 2016
Desktop
69.2%
Mobile
26.7%
Tablet
4.1%
0%
14%
28%
42%
56%
70%

DotQA Test by Hanoi - Design & Functionality	Date	Person
Win7-Chrome		
Win7-FireFox		
Win7-IE8		
Win7-IE9		
Win7-IE10		
Win7-IE11		
Mac-Safari		
Mac-FireFox		
Mac-Chrome		
Samsung Galaxy S5 - Android 4.4.2		
iPhone 6 - iOS 8.1		
iPhone 6 Plus - iOS 8.1		
Black Berry Bold - BlackBerry OS 7		
Surface - Windows 8		
iPad Air - iOS 8.1		
iMac - OS X 10.9.4		

HOW TO SET UP A ENVIRONMENT

VirtualBox: Modern.ie:

(Support IE6 – MS Edge)

https://www.virtualbox.org/wiki/Downloads

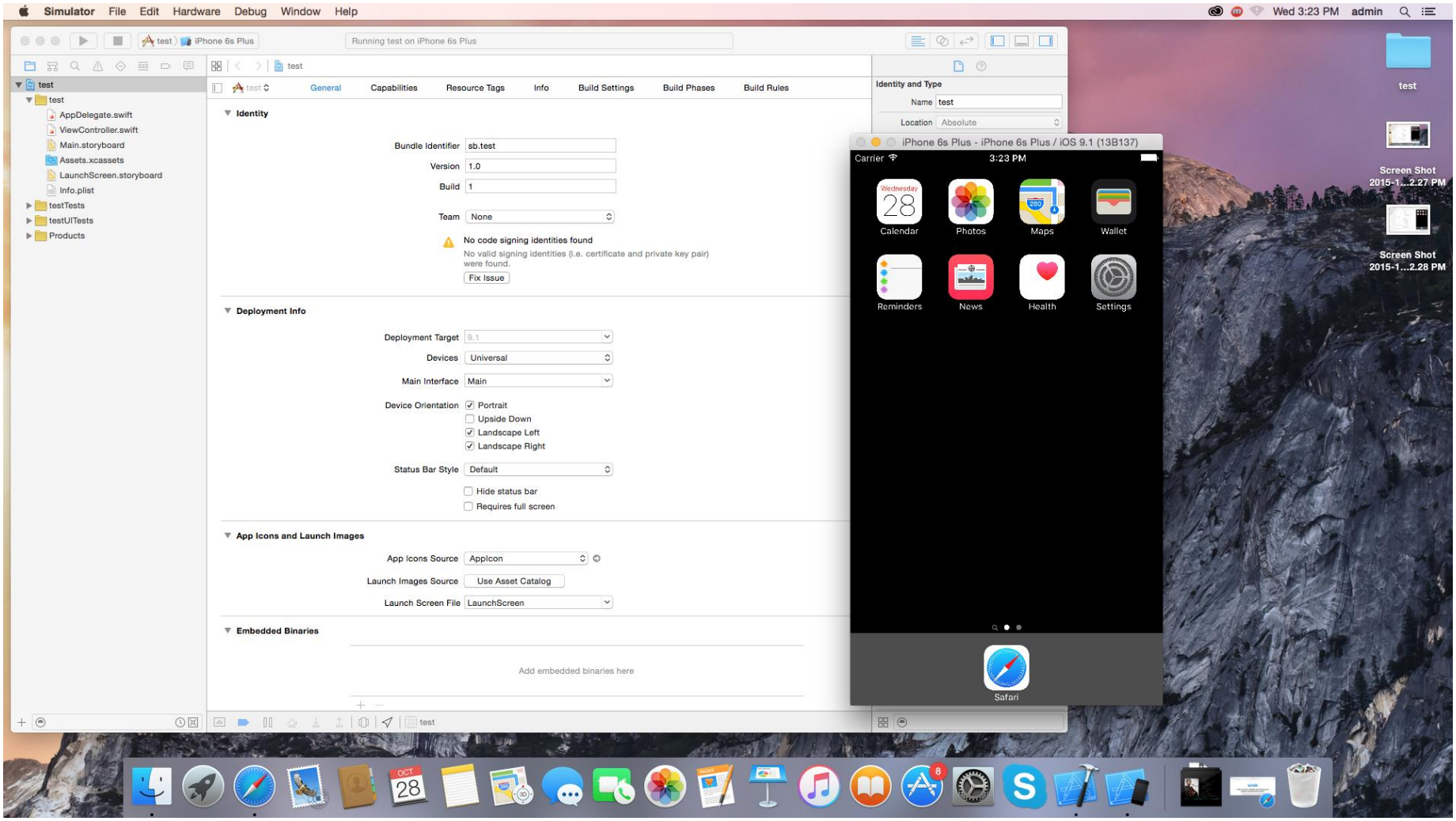
https://dev.modern.ie/tools/vms/windows/

IE Tab: Chrome & Firefox. Support IE 7,8,9

Tools:

- www.browseemall.com
- https://crossbrowsertesting.com
- https://saucelabs.com
- https://www.browserstack.com

SAFARI BROWSER



Genymotion for personal use - Samsung Galaxy S5 - 4.4.4 ...

1:45

APPS WIDGETS

Anh Văn
API Demos
APK Info
Browser
Calculator
Calendar
Camera
Camera360
Clock
Custom Locale
Dev Settings
Dev Tools
Downloads
Email
File Manager
Gallery
Messaging
Movie Studio
Music
People

free for personal use

Genymotion for personal use - Samsung Galaxy S5 - 4.4.4 ...

1:45

sangbui.com

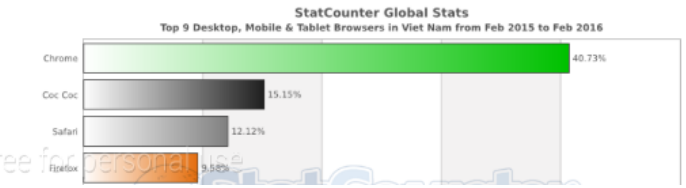
Sang Bui

Home Download

Thống kê trình duyệt sử dụng ở Việt Nam

Các thông số bên dưới là thống kê ở thị trường **Việt Nam** trong một năm qua (tháng 02/2015 – tháng 02/2016) trên Desktop – Mobile – Tablet.

Tỉ lệ các trình duyệt được sử dụng.



free for personal use

QUIZ

How to setup this requirements:

Chrome latest

Chrome 46

Chrome 44

Firefox latest

Firefox 45

Firefox 43

Firefox 42

IE Edge

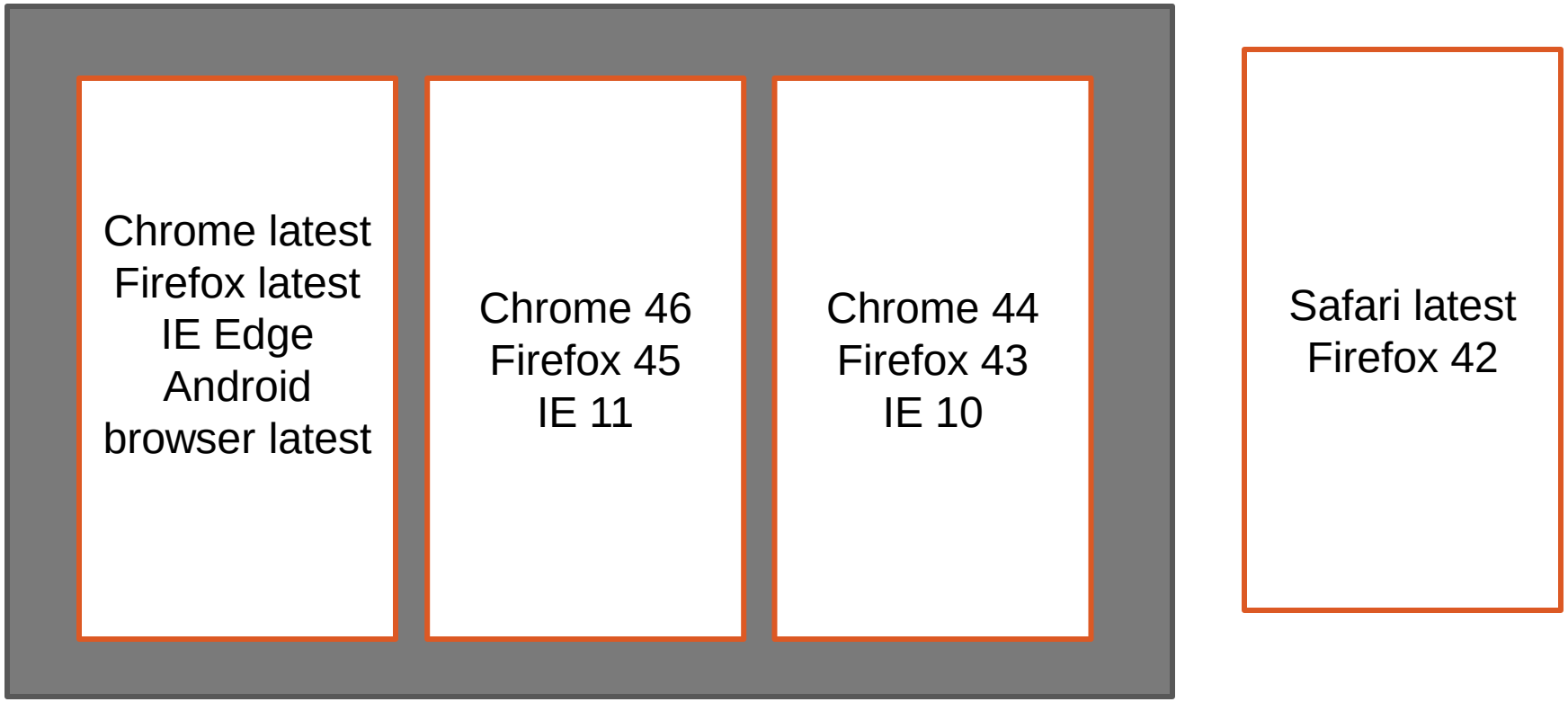
IE 11

IE 10

Safari latest

Android browser latest

ANSWER


Chrome latest
Firefox latest
IE Edge
Android browser latest
Chrome 46
Firefox 45
IE 11
Chrome 44
Firefox 43
IE 10
Safari latest
Firefox 42

CHECK SUPPORTED CODE

http://fmbip.com/

http://www.browseemall.com/Compatibility/ValidateHTML

https://www.browseemall.com/Resources

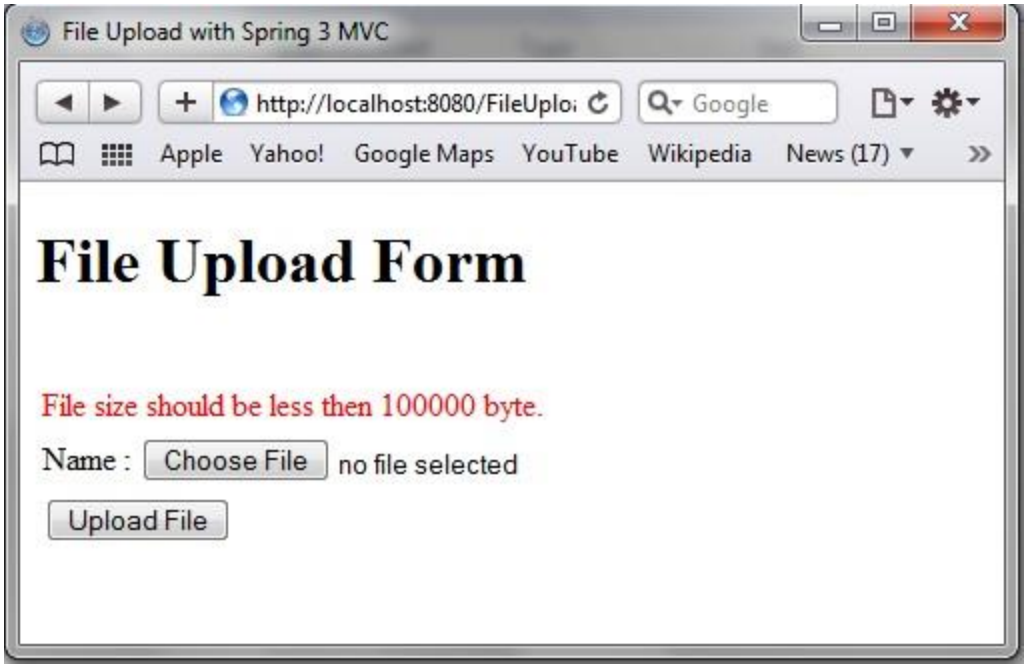
https://html5test.com/

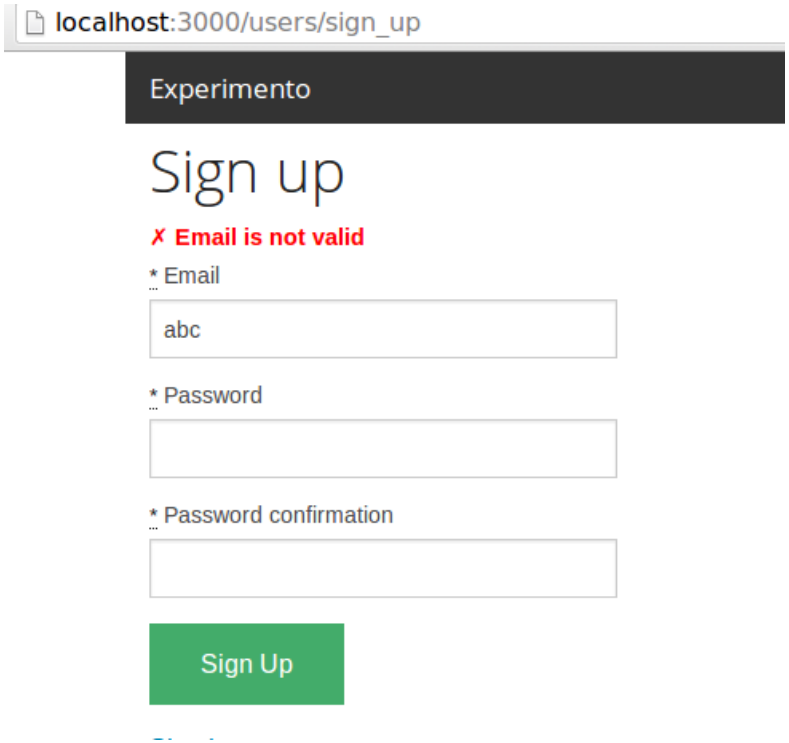
https://html5test.com/compare/browser/index.html

CLIENT-SIDE TESTING

Hey! Wake up.

CLIENT VALIDATION





CLIENT SIDE TESTING

Client-Side testing is concerned with the execution of code on the client, typically natively within a web browser or browser plugin.

BYPASS CLIENT-SIDE

- **Disabling JavaScript in the browser**
- **Using a browser tool (ex: Firebug)**
- **Using a proxy tool like WebScarab or Tamper Data to intercept any submitted data and manipulate it before sending it on to the server.**

PRACTICE ISSUES

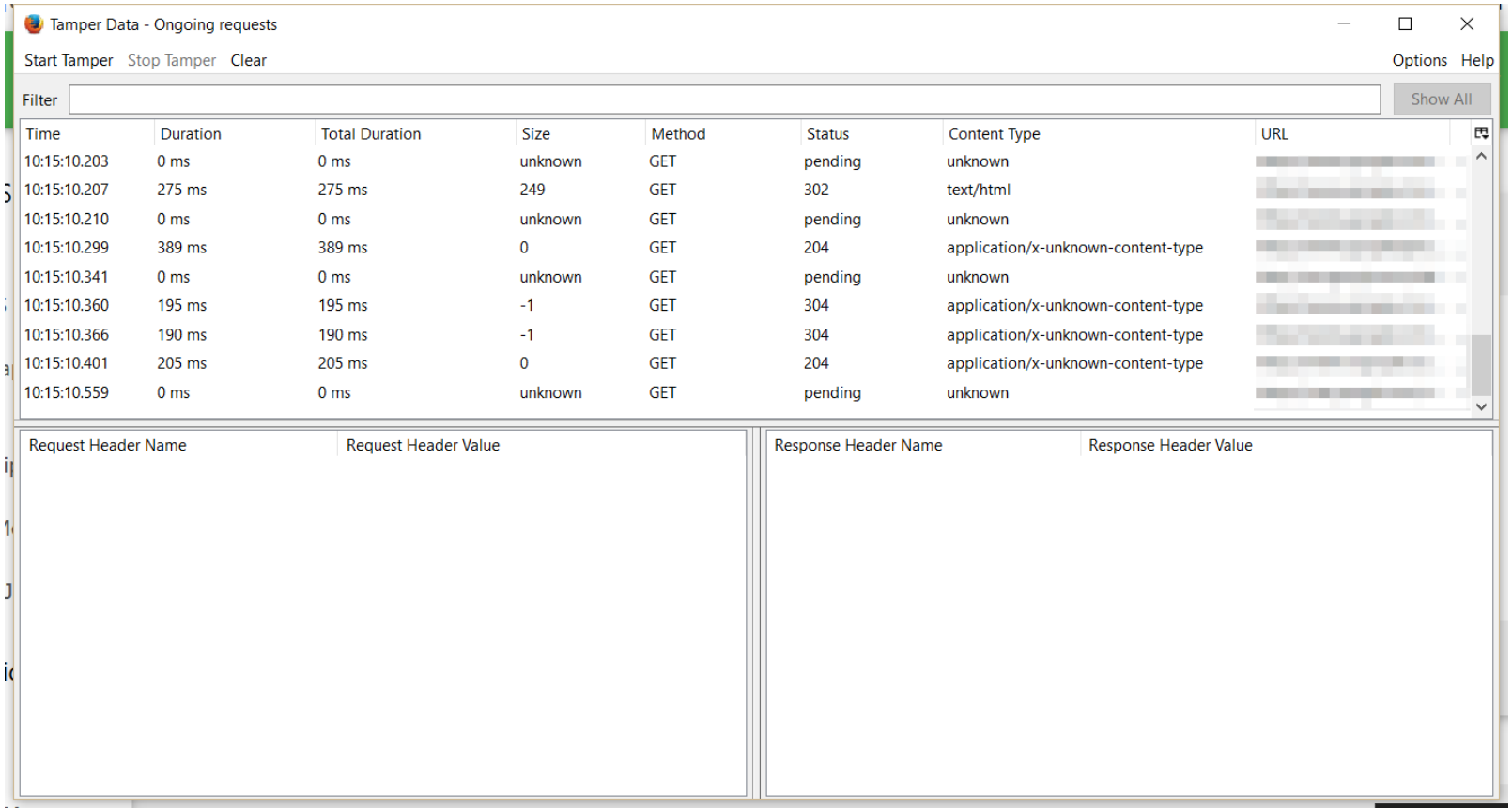
- **HTML input required Attribute**
- **HTML input maxlength Attribute**
- **Check upload file format**
- **Check locked/security content**

http://www.w3schools.com/tags/tryit.asp?filename=tryhtml5_input_required

http://www.w3schools.com/tags/att_input_maxlength.asp

http://demo.byonepress.com/premium/sl-wp/

TAMPER DATA



Download: https://addons.mozilla.org/en-US/firefox/addon/tamper-data/

“PLAY WITH THE CLIENT-SIDE”

REFERENCES

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http://taligarsiel.com/Projects/howbrowserswork1.htm

http://www.html5rocks.com/en/tutorials/internals/howbrowserswork/

https://lab.cs.ru.nl/laquso/Reliability_of_Google_Chrome

http://sangbui.com/thong-ke-trinh-duyet-su-dung-o-viet-nam/

http://blog.kloud.com.au/2014/05/02/cross-platform-testing-myths-vs-mysteries/

https://www.owasp.org/index.php/Client_Side_Testing

THANK YOU

Q&A