

WEB & MOBILE SYSTEMS

CSI 3150

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AGENDA

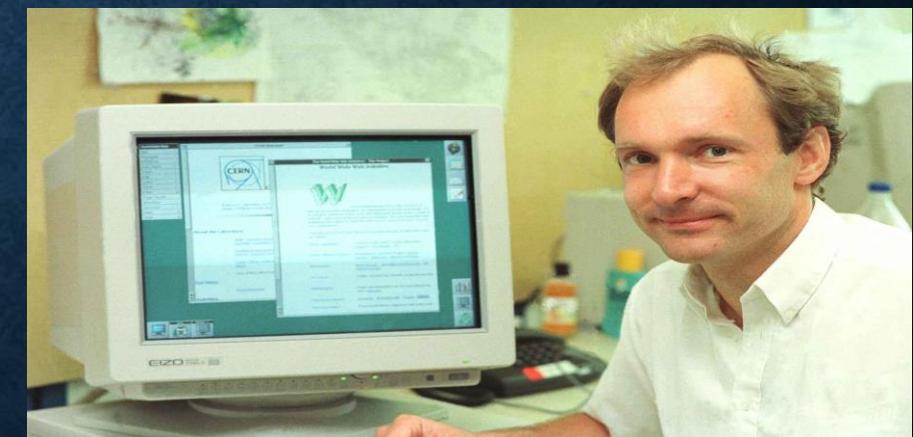
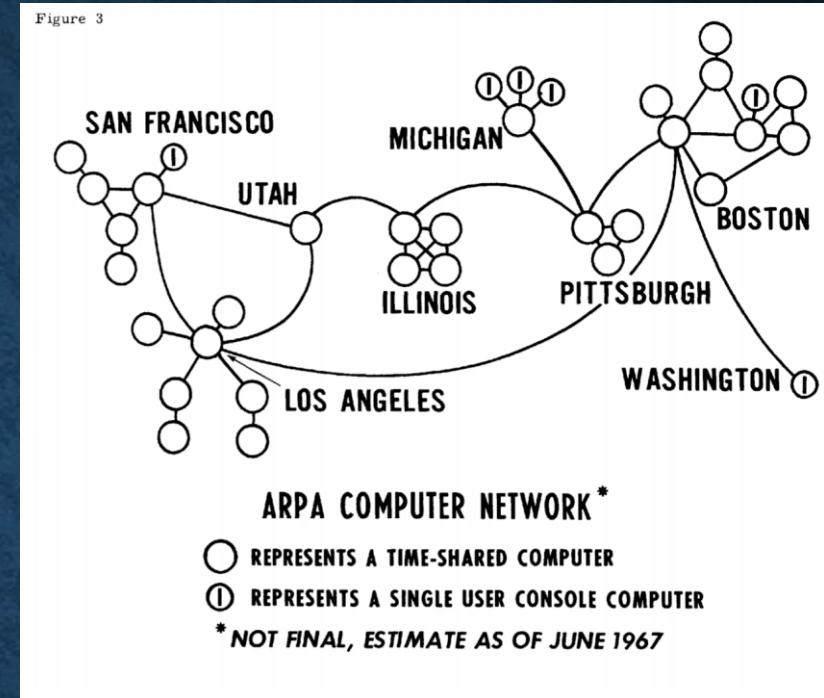
- Introductions and discussions on syllabus
- Basics and Fundamentals like
 - Types of web and mobile systems – static, dynamic / CMS, eCommerce
 - Components: front end, back end / server side, and data store
 - The client server architecture and communication protocols
- Course Overview & Topics to be covered

FUNDAMENTALS AND TERMINOLOGIES

WHAT IS THE INTERNET AND WORLD WIDE WEB?

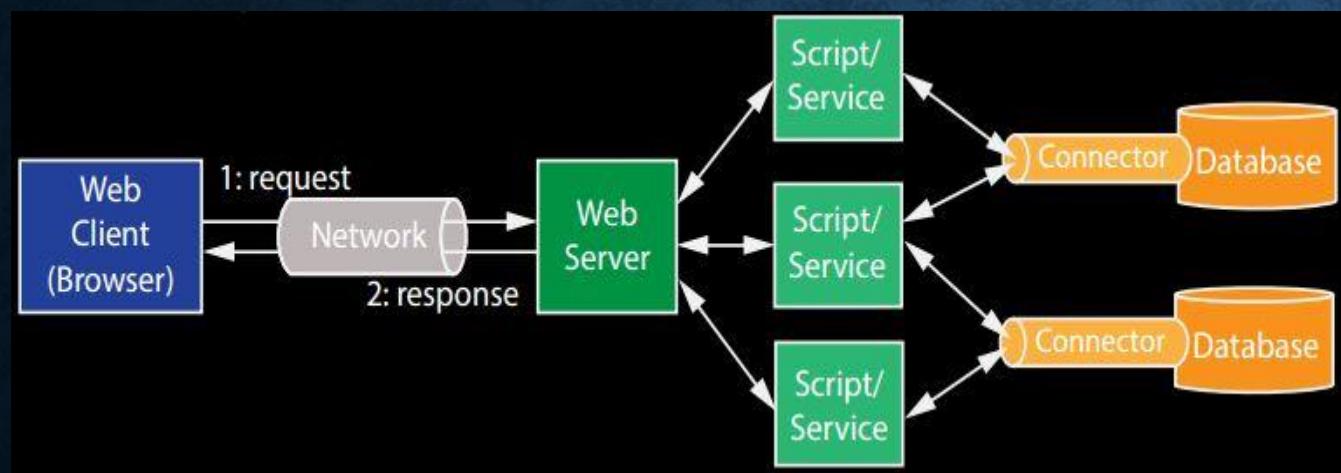
- How would you define the Internet?
- What is the World Wide Web?

- How would you define the Internet?
 - Internet or the net, is a communication network for all computers. As such it is categorized as **hardware**.
 - Originated in the late 1960s from ARPANET
- What is the World Wide Web?
 - World Wide Web (WWW) is one of the biggest **services** facilitated by the Internet. As such it is categorized as **software**. Users communicate over the Internet through software applications
 - Origins: Tim Berners-Lee and HTML; first GUI browser Mosaic (1989)

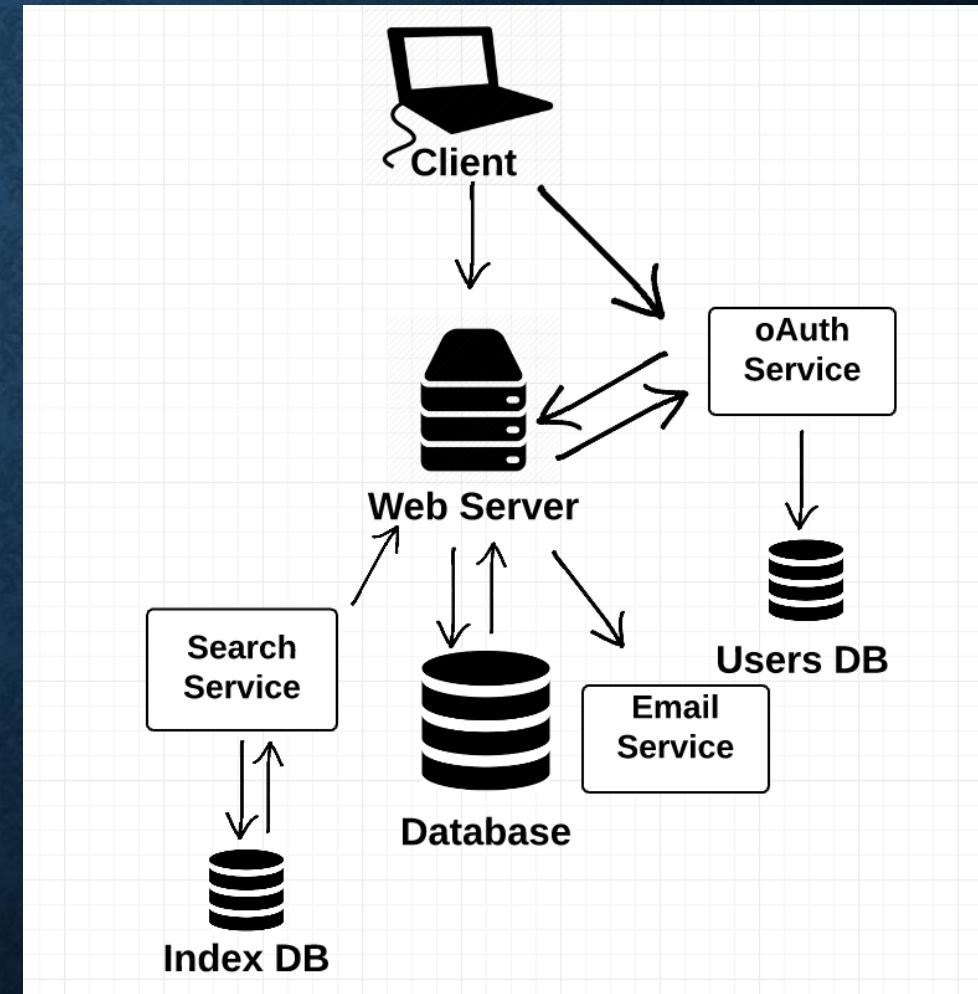


Father of WWW and inventor of HTML

CLIENT-SERVER ARCHITECTURE AND INTERACTIONS



- “Client” makes a [HTTP] request to a “server”
- Server send a [HTTP] response
 - “serving” the request
 - Sending an error message
- Much more nuances embedded within the above interactions

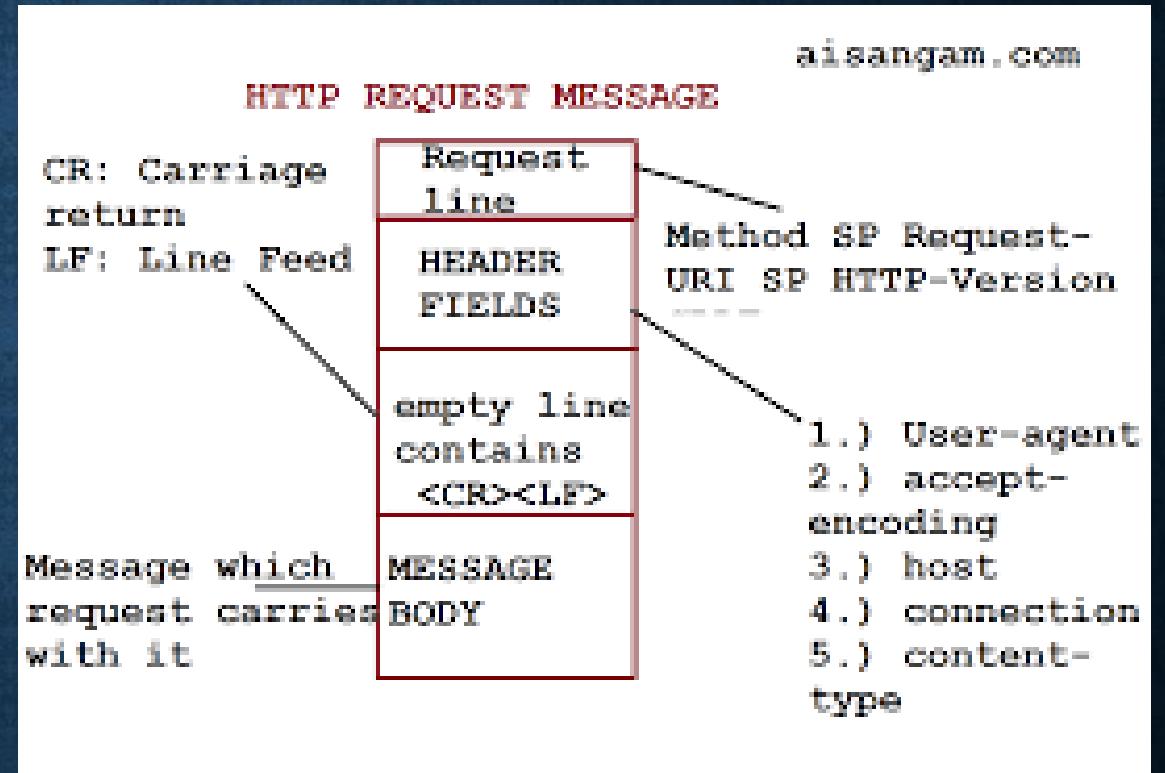


TERMS: WEB SERVERS AND WEB BROWSERS

- **Server:**
 - Program / Machine on which the website is hosted
 - E.g. Apache Web Server, NGINX, etc.
- **Browser:**
 - Program that acts as the clients in the client-server architecture
 - E.g. Firefox, Chrome, Safari, Edge, etc.

TERMS: HTTP REQUEST

- HyperText Transfer Protocol Request from a browser contains:
- A request line, with a request method (often GET or POST), the URI of the desired resource, and the version of HTTP in use
- Some header lines, indicating such things as language in use, encoding scheme, and so on
- A (very important) blank line
- An optional message body



```
POST / HTTP/1.1
Host: localhost:8000
User-Agent: Mozilla/5.0 (Macintosh; ... )... Firefox/51.0
Accept: text/html,application/xhtml+xml,...,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Connection: keep-alive
Upgrade-Insecure-Requests: 1
Content-Type: multipart/form-data; boundary=-12656974
Content-Length: 345
-12656974
(more data)
```

Request headers

General headers

Representation headers

TERMS: HTTP RESPONSE

An HTTP response from a server contains

- A status line, indicating everything is OK or a number indicating that an error has occurred (404 not found, for example)
- Some header lines, providing information about the response, especially its content type
- A (very important) blank line
- The content of the returned web page or other resource

```
HTTP/1.1 200 OK
Date: Sun, 28 Aug 2017 08:56:53 GMT
Server: Apache/2.4.27 (Linux)
Last-Modified: Fri, 20 Jan 2017 07:16:26 GMT
ETag: "10000000565a5-2c-3e94b66c2e680"
Accept-Ranges: bytes
Content-Length: 44
Connection: close
Content-Type: text/html
X-Pad: avoid browser bug
<html><body><h1>It works!</h1></body></html>
```

OTHER WEB PROTOCOLS TO KEEP IN MIND...

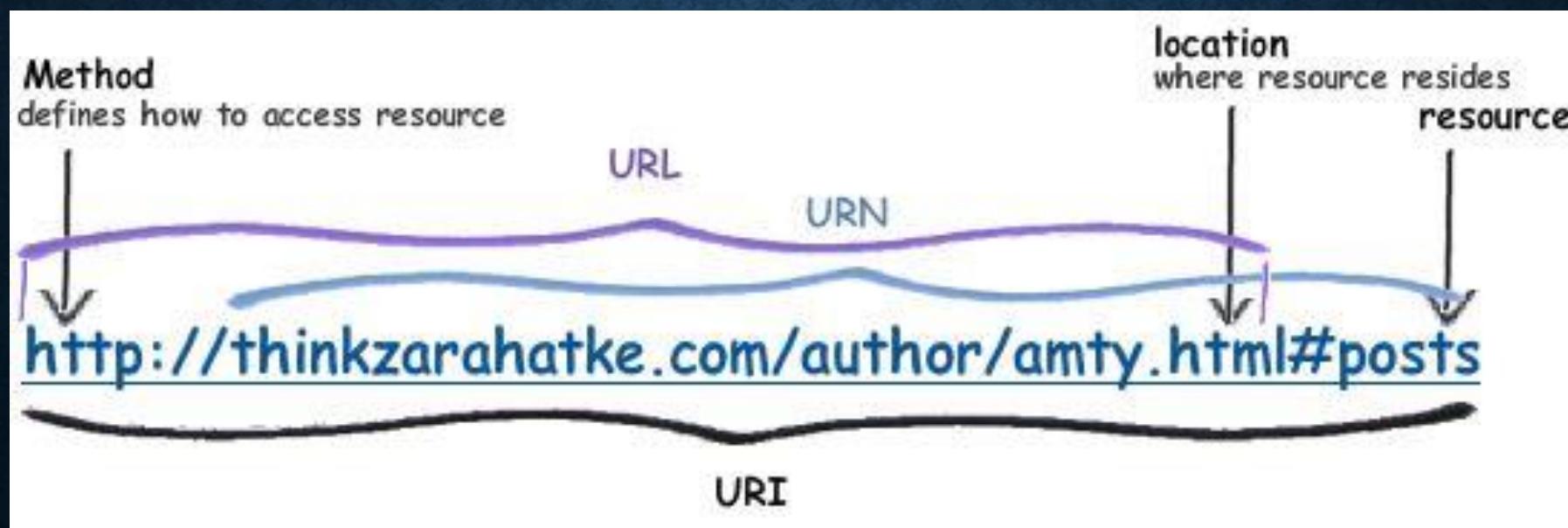
- **TCP/IP** (Transmission Control Protocol / Internet Protocol) is the fundamental protocol for most communication on the web
- **UDP** (User Datagram Protocol) is fast and can be used if there is a lot of data and you don't mind losing a few bits
- **FTP** (File Transfer Protocol) is a file transfer standard
- **TELNET** provides a non-secure way to login to a remote computer
- **SSH** (Secure Shell) can be thought of as a “secure telnet”

TERMS: IP ADDRESSES

- Every device connected to the Internet must have a unique IP address:
 - IPv4 is 32 bits: a.b.c.d with a, b, c, d in 0..255
 - IPv6 is 128 bits, allowing for many more addresses
- Computers understand IP addresses much better than humans, who prefer FQDNs (Think High Level vs. Low Level Languages)
 - FQDN = Fully Qualified Domain Name
 - FQDN cs.smu.ca has IP address 140.184.133.99
 - A Domain Name Server (DNS) translates between an IP address and the corresponding FQDN

TERMS: URLs, URNs, AND URIs

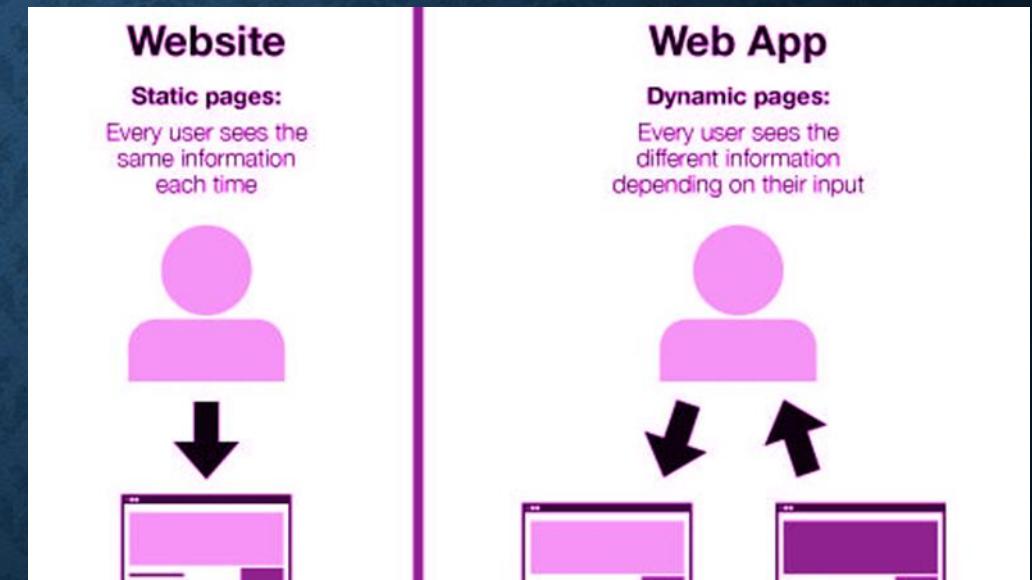
- URL: Uniform Resource Locator (location on the web)
- URN: Uniform Resource Name (actual resource path)
- URI: Uniform Resource Identifier (generalization of URL & URN)



WEBSITES, WEBAPPS, AND THEIR TYPES

WEBSITE VS. WEB APPLICATIONS

- **Website:** globally accessible, interlinked web pages which have a single domain name. Example: Blogs.
- **Web Application:** a software or program which is accessible using any web browser.
 - It has a frontend created using languages like HTML, CSS, JavaScript,
 - A backend developed using a programming stack like LAMP, MEAN, etc.
 - Unlike mobile apps, there is no specific SDK for developing web applications.



TYPES OF WEBSITES/WEB APPS

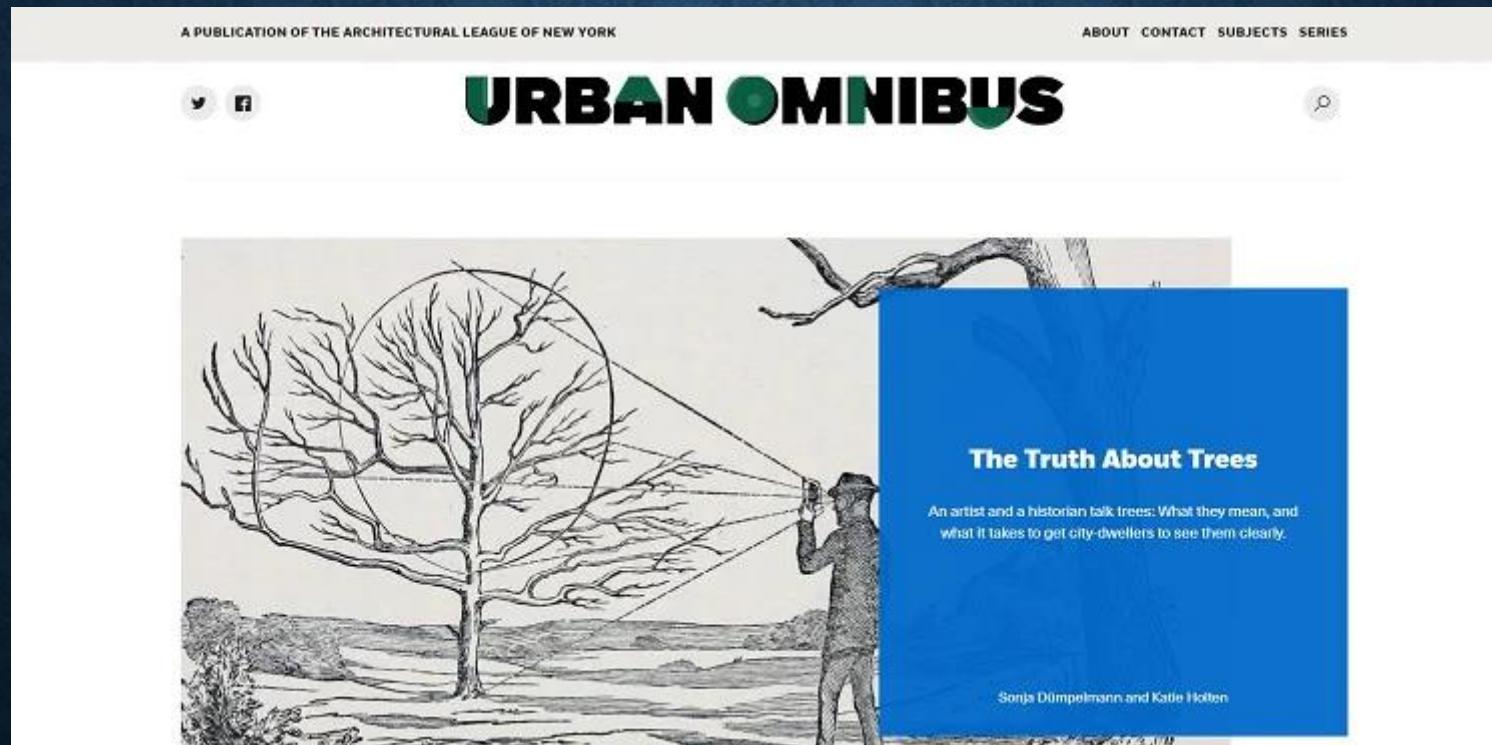


THE HOMEPAGE

The screenshot shows the homepage of Matcha Kari. At the top, there's a red header bar with promotional buttons: "SUBSCRIBE TO 3 ITEMS, GET 10% OFF" (with "SHOP NOW" in a black box), "REFER A FRIEND AND GET \$10" (with "GET STARTED" in a black box). Below the header is the Matcha Kari logo, which includes a green circle icon, the brand name "MATCHA KARI", and the tagline "SUPERIOR MATCHA". The main visual is a white background featuring various matcha tea tools: two bamboo chasen (whisks), a bamboo chashaku (spoon), a bamboo rest, a metal chashai (teapot), and a small pile of matcha powder. Overlaid on the left side is a large, bold text: "Bringing the world's best Matcha to you". Below this text is a button bar containing "► WATCH THE VIDEO" (with a play icon) and "VISIT STORE" (with a shopping cart icon).

<https://matcha.com/pages/contact>

MAGAZINES AND NEWSPAPERS



<https://urbanomnibus.net/>

E-COMMERCE

The screenshot shows the Walmart.com website. At the top, there's a promotional banner for Butterball turkey with the text "Try all-natural Butterball® turkey this Thanksgiving" and a link to "Get turkey tips". Below this is the Walmart navigation bar with links for Departments, Search, Reorder Items, Sign In, and Cart. A banner for "FREE Walmart Grocery pickup" is visible. The main content area features a large image for "OPENING ACT Holiday Specials" with the text "Check out these rockin' savings now!" and a "Samsung 49" Curved UHD Smart LED TV" offer for \$497.99, down from \$402. Below this are sections for "Free 2-Day Shipping", "Free Same-Day Pickup", and "Free Grocery Pickup". A "Featured tech for the holidays" section displays several laptops with their prices and ratings.

BUTTERBALL Try all-natural Butterball® turkey this Thanksgiving Get turkey tips

Walmart Departments All Search

FREE Walmart Grocery pickup

Pickup Today Shop Grocery Weekly Ads Gift Cards Credit Card Store Finder Track Order Help

OPENING ACT Holiday Specials Check out these rockin' savings now!

Samsung 49" Curved UHD Smart LED TV just \$497.99 save \$402

Free 2-Day Shipping on millions of items

Free Same-Day Pickup your must-haves, ready today

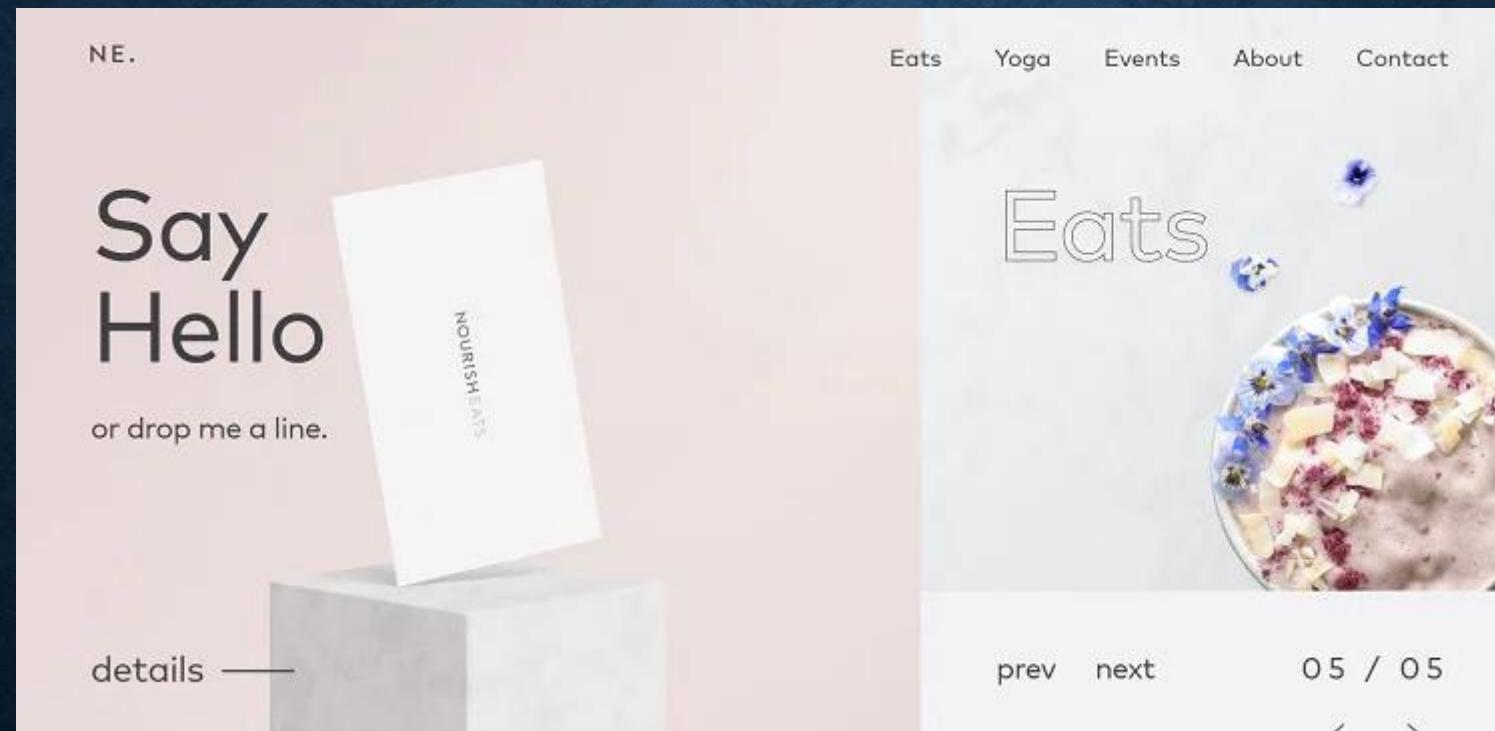
Free Grocery Pickup order online, pick up curbside

Featured tech for the holidays

Product	Price	Rollback	Rating	Shipping
Acer Chromebook R11 CB5-132T-C67Q Touch...	\$249.00	Rollback	★★★★★ 12	2-Day Shipping
Ematic 11.6" Laptop, Touchscreen, 2-In-1...	\$179.00	Rollback	★★★★★ 12	2-Day Shipping
HP Onyx Blizzard Ci5 15-cb035wm 15.6 ...	\$899.00	Rollback	2-Day Shipping	★★★★★ 5
Acer Aspire 5 A515-51-3509, 15.6" ...	\$419.00	Rollback	2-Day Shipping	★★★★★ 38
HP Stream 11.6" Laptop, Windows 10 Home, ...	\$199.00	Rollback	2-Day Shipping	★★★★★ 38
Acer Aspire E15 E5-575-74RC 15.6" Full...	\$549.00	Rollback	2-Day Shipping	★★★★★ 4
Lenovo Ideapad 320 15.6" Laptop, Windows 10, ...	\$229.00	Rollba	2-Day Shipping	★★★★★ 12

<https://www.walmart.com/>

BLOGS



<https://nourisheats.co/>

PORTFOLIO WEBPAGES



<https://gautiermaillard.com/>

LANDING PAGES



<https://www.shopify.com/free-trial>

SOCIAL MEDIA

facebook

Email or Phone Password Log In Forgot account?

Nutella  @Nutella

Home About Photos Events Welcome Videos Posts Community Info and Ads Create a Page

Like Share Suggest Edits ... Learn More Send Message

Photos

Today, I'll share my nutella with... 

Hi, neighbor 

Search for posts on this Page

Nutella Food & Beverage Company

Community See All 31,599,866 people like this 31,739,451 people follow this

About See All

- Contact Nutella on Messenger
- www.nutella.com
- Food & Beverage Company - Company

Page Transparency See More

Facebook is showing information to help you better understand the purpose of a Page. See actions taken by the people who manage and post content.

Page created - July 29, 2008



<https://www.facebook.com/Nutella/>

DIRECTORY AND CONTACT PAGES



<https://www.manta.com/>

TYPES OF WEB DESIGN

- Static:
 - Couple of pages and data does not change frequently (or ever)
 - Update is manual and sometimes tedious and time consuming
 - Cannot support complex features and high functionalities
 - HTML and CSS will suffice
- Dynamic or CMS:
 - Can convey dynamic data
 - Dynamic updates depending on criteria
 - CMS tools – WordPress, Joomla, Drupal, etc
 - Hard to design at times
 - HTML, CSS, JS (client side) + server side + data store
- eCommerce
 - If your application must support sales transactions
 - Platforms to design – OpenCart, Woocommerce, Zencart, Magento, etc
 - eCommerce designs are generally built on top of CMS design

MOBILE APPS AND THEIR CATEGORIES

- Native:
 - Native to a particular platform: iOS or Android or Windows
 - Optimizes user experiences on a given platform but impacts portability
- Hybrid
 - Installed on devices but run through web browsers on these devices
 - Developed through HTML5 and not as fast or reliable as native apps
- Web Apps
 - Responsive web apps which can change design when accessed through a mobile device
 - Mostly about manipulating screen size using JavaScript

COMMON MOBILE APPS CATEGORIES

- Educational Apps:
 - Duolingo, the weather channel
- Lifestyle Apps
 - Tripadvisor, Zillow, Uber, Bumble/Tinder
- Social Media Apps
 - Facebook, Instagram, TikTok
- Productivity Apps
 - Calculator, Wunderlist, Square register, Google Pay, Google Suite
- Entertainment Apps
 - Netflix, Hulu, Kindle, YouTube
- Gaming Apps
 - Subway Surfer, Sudoku, PUBG

QUESTIONS FOR STUDENTS

- What is difference between Java and JavaScript?
 - JS is developed by NetScape Inc and is not part of the Java Platform
 - JS cannot be used to create standalone apps; Unless using frameworks such as ElectronJS
 - In common form, JS is embedded in HTML docs to provide interactivity in web pages.
- Differences between Java and JS
 - Java is an OOP programming language while Java Script is an OOP scripting language.
 - Java creates applications that run in a virtual machine or browser while JavaScript code is run on a browser only (unless there are runtime environment like NODEJS).
 - Java code needs to be compiled while JavaScript code are all in text.
 - They require different plug-ins.

QUESTIONS FOR STUDENTS

- What is the difference between programming and scripting languages?
 - **Programming language** is a set of instructions that can be fed into a computer to achieve a specific output.
 - **Scripting language** is a programming language supporting scripts written exclusively for a special runtime environment to automate a specific action/function execution.
- **Programming languages** are compressed into smaller packages that do not need to be interpreted by another language or application.
- **Scripting languages** are written in one language and interpreted within another program. For instance, JavaScript has to be incorporated within HTML, which the Internet browser will then interpret.
- Read more on : <https://www.codingninjas.com/blog/2018/12/08/difference-between-a-programming-language-and-a-scripting-language/>