Unit 1

INTRODUCTION TO THE WEB

2CP08: WEB TECHNOLOGIES

Contents

- Concept of WWW
- Internet and WWW
- HTTP Protocol : Request and Response
- Web browser and Web servers
- Web 1.0, Web 2.0, and Web 3.0
- Designing an Effective Web Site
- Web Site Design Issues
- Planning a Web Site
- Navigation

Concept of WWW

- 1960s ARPANET: Defense Advanced Research Projects Agency (DARPA)
- 1989s European Particle Physics Laboratory, introduce Hypertext space, any network accessible information could be refereed to by single ”Universal Document identifier”
- 1990s: Development of web browser and web server, WWW, URIs, HTML, HTTP
- 1991s to 1994s load first web server info.cern.ch increase factor of ten every year
- 1994s W3C World wide webs consortium: act as neutral forum

Internet and WWW

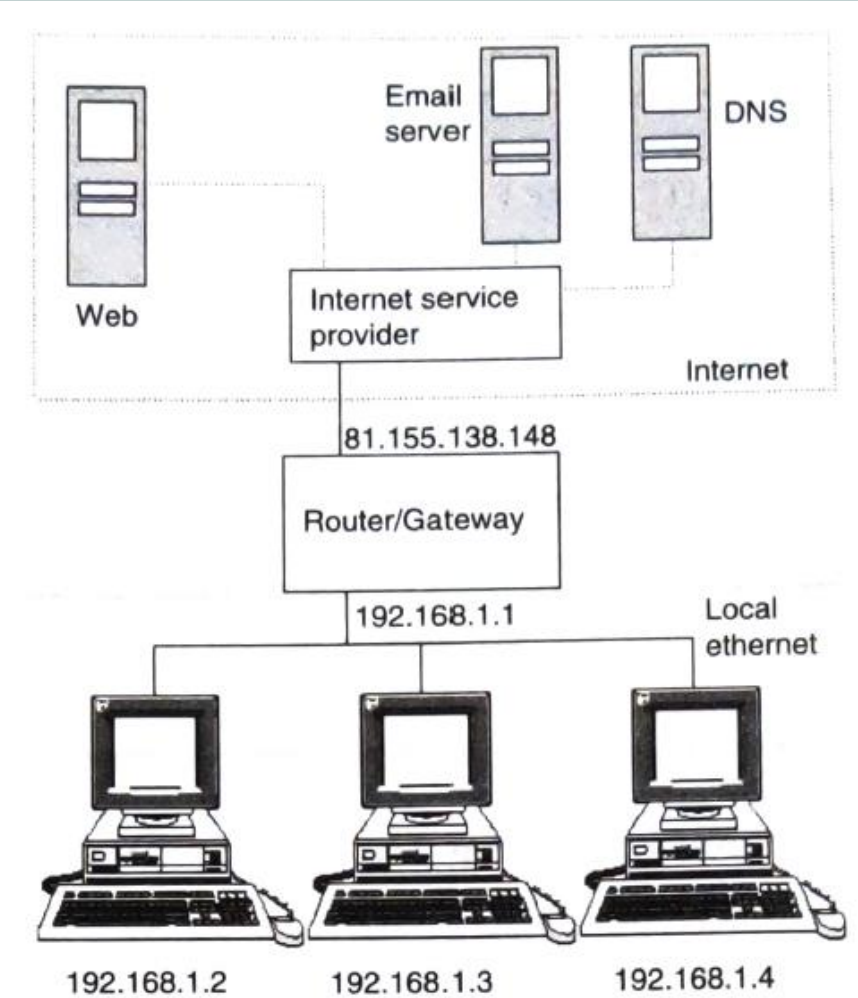


Figure 1 How computers link to the Internet.

OSI Model

Table1 OSI model

OSI Level	*Stack Layer*	*Protocol*
7	Application	HTTP, SMTP, SNMP, FTP, Telnet, SSH, Scp, NFS, RTSP
6	Presentation	XDR, ASN.1, SMB, AFP
5	Session	TLS, SSH, RPC, NetBIOS, ASP
4	Transport	TCP, UDP, RTP, SCTP, SPX, ATP
3	Network	IP, ICMP, IGMP, X.25, CLNP, ARP, RARP, BGP, OSPF, RIP, IPX, DDP
2	Data Link	Ethernet, Token Ring, PPP, HDLC, Frame Relay, ISDN, ATM, 802.11 Wi-Fi, FDDI
1	Physical	Electrical, radio, laser

Internet Layered Model

Table 2 Internet layered model

OSI Level	*Stack Layer*	*Protocol*
7	Application	HTTP, SMTP, SNMP, FTP, Telnet, SSH, Scp, DNS
4	Transport	TCP, UDP, RTP, SCTP, SPX, ATP
3	Network	IP, ICMP, IGMP, X.25, CLNP, ARP, RARP, BGP, OSPF, RIP, IPX, DDP
2	Data Link	Ethernet, Token Ring, PPP, HDLC, Frame Relay, ISDN, ATM, 802.11 Wi-Fi, FDDI
1	Physical	Electrical, radio, laser

Protocols and Programs
FTP

```
>ftp mysuperserver.co.uk
Connected to mysuperserver.co.uk.
220 FTP Server ready.
Name (mysuperserver.co.uk:ralphmoseley): ralph101
331 Password required for ralph101.
Password:
230 User ralph101 logged in.
Remote system type is UNIX.
Using binary mode to transfer files.
ftp>put myIndex.doc
```

1. ftp – start an ftp session
2. ls – list files
3. get – download a file from the server
4. put – upload a file to the server
5. mkdir – make a directory on the server
6. cd – change to a new directory on the server
7. close – close the connection
8. open – open a new connection
9. bin – binary mode transfer
10. asc – ASCII text mode transfer.

EMAIL

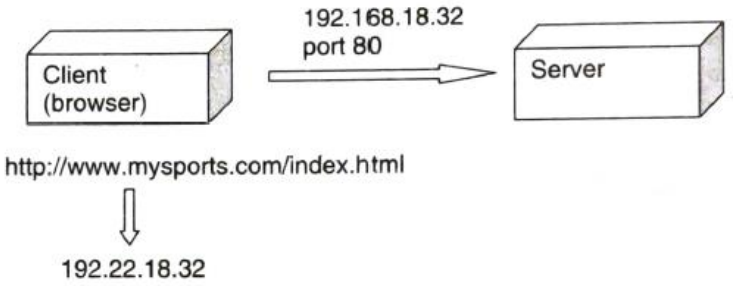
- SMTP Client
- POP3
- IM

Remote Machine Access
SSH, TELNET

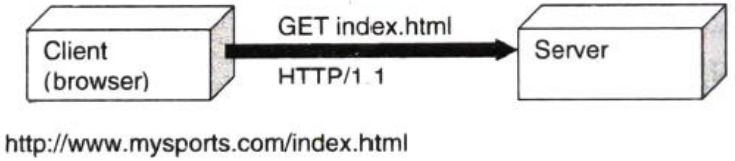
```
Raptor-Computer: ~ ralphmoseley$ ssh ralph@192.168.1.4
Password:[type password]
Last login: Sat Mar 12 18:50:54 2005 from 192.168.1.2
Copyright (c) 1980, 1983, 1986, 1988, 1990, 1991, 1993, 1994
The Regents of the University of California. All rights
                reserved.

FreeBSD 4.10-RELEASE (GENERIC) 0: Tue May 25 22:47:12 GMT 2004
Welcome to FreeBSD!

aphid# ls
.cshrc    .login          .rnd          server.csr
.history  .mysql_history  mbox          server.key
.klogin   .profile        server.crt
aphid# logout
Connection to 192.168.1.4 closed.
```

Web Pages

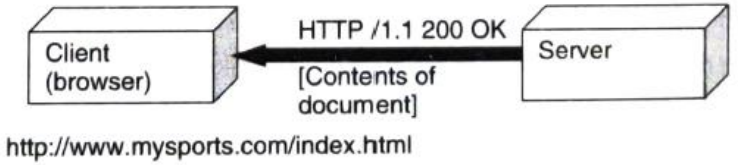
The first stage is the user typing a URL in the browser address window.



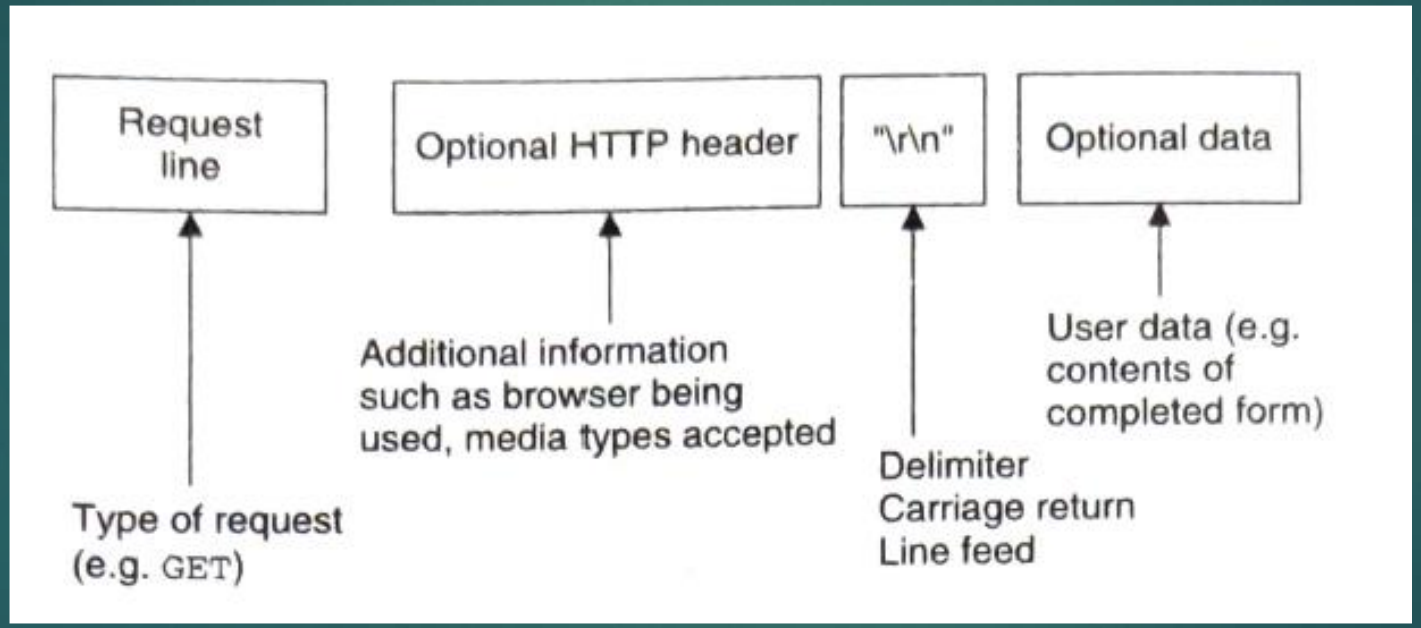
In the next stage the URL is converted to an IP address, which is then used to make a connection to the server at that location via port 80, the one used for HTTP and the Web.



Once the connection is established, the client application extracts the file name that is required from the URL and sends the request down the established connection. When received, the server looks up the request.



GET /index.html HTTP/1.0



```
$ telnet aphid.dynalias.net 80
Trying 81.155.138.148...
Connected to 81.155.138.148.
Escape character is '^]'.
GET /index.html HTTP/1.0

HTTP/1.1 200 OK
Date: Fri, 04 Mar 2005 20:02:01 GMT
Server: Apache/1.3.29 (Unix) PHP/4.3.6 mod_ssl/2.8.16
                OpenSSL/0.9.7d

Last-Modified: Mon, 06 Sep 2004 12:43:33 GMT
ETag: "4c9003-a71-413c5b75"
Accept-Ranges: bytes
Content-Length: 2673
Connection: close
Content-Type: text/html

<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 3.2 Final//EN">
<HTML>
<!--Web page here -->
</HTML>
Connection closed by foreign host.
```

1. HTTP request message.
2. HTTP response message.
3. HTTP methods.
4. HTTP status codes.

1. 404 = Not found
2. 401 = Unauthorized
3. 500 = Internal server error
4. 501 = Not implemented.

Secure Connection

Communication	*Application*	*Protocol*	*Port*	*Security*
Web page	Browser	HTTP	80	–
Web page	Browser	HTTPS	443	Secure
Files[Binary/Text]	FTP	FTP	21	–
Files[Binary/Text]	SFTP	SFTP	22	Secure
Files[Binary/Text]	FTP	FTPS	990	Secure
Commands	Telnet	Telnet	23	–
Commands	SSH	SSH	22	Secure
Instant Messaging	IRC	IRC	194	Not usually secure

Application and Development Tools

- IDE's.
- VS Code
- Webstrom/PHPstrom
- Netbeans
- Sublime
- IntelliJ IDEA
- Brackets
- Code::Blocks
- Notepad++

What is inside a Browser?

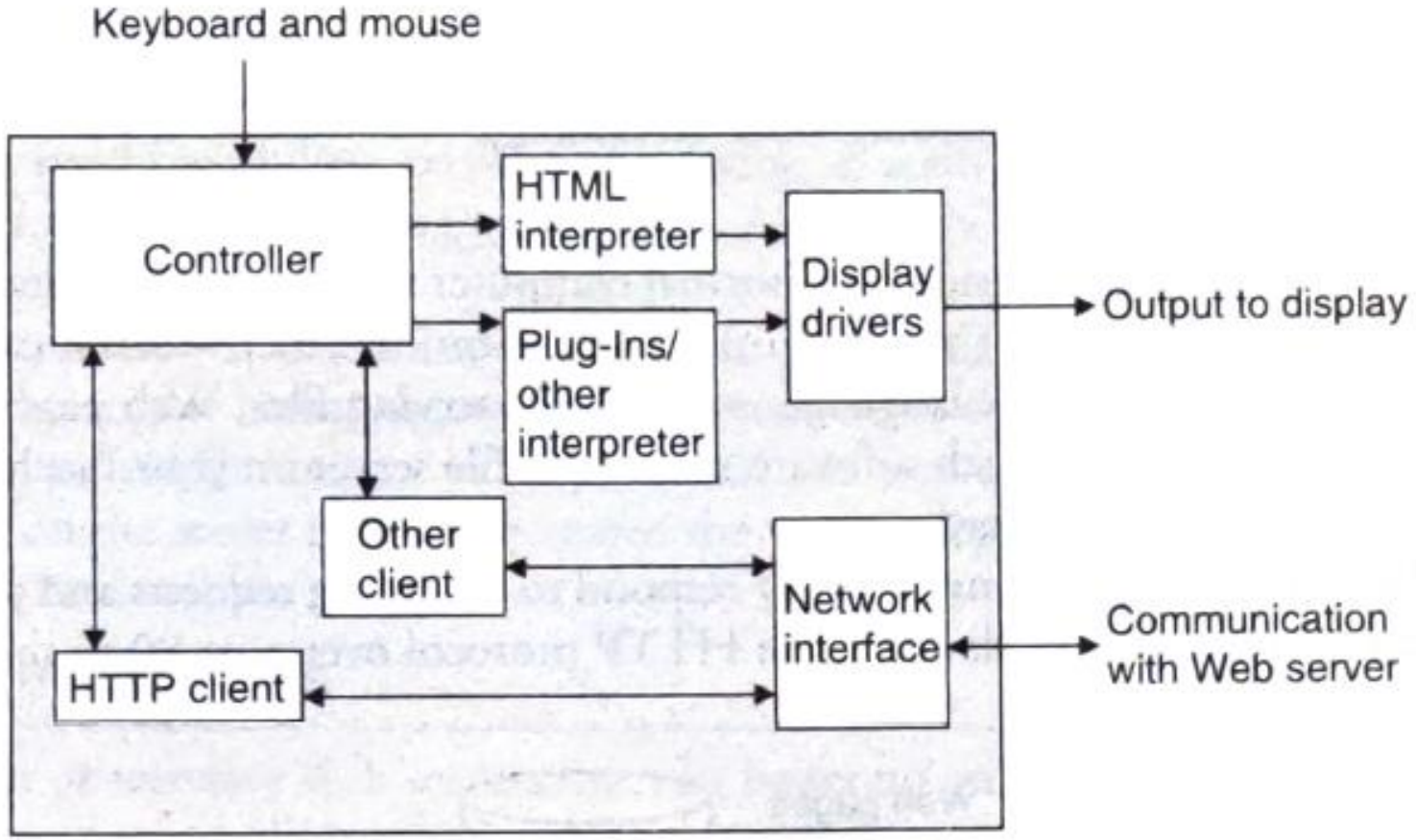


Figure 2 Architecture of a browser.

Web Server

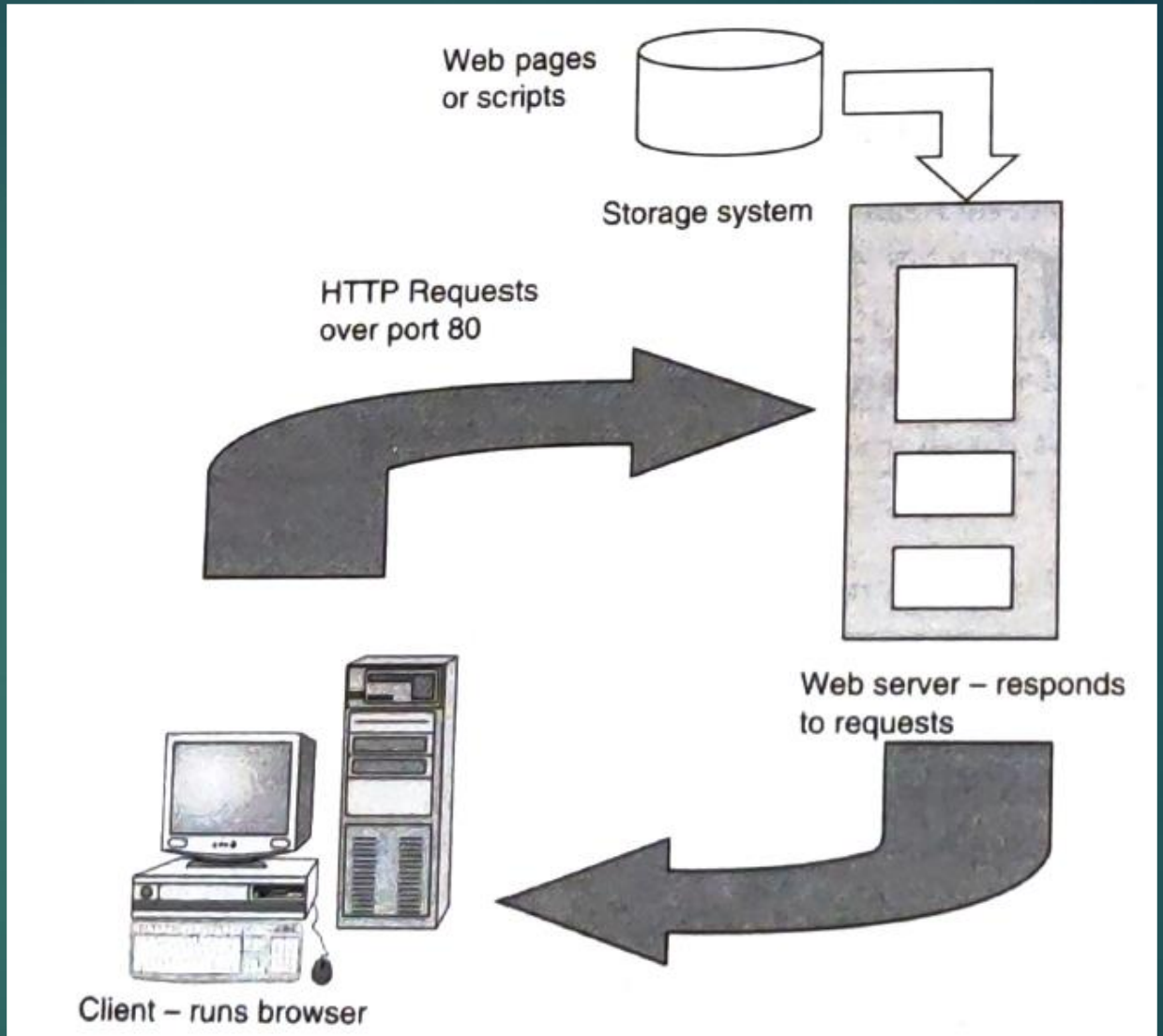


Figure 3 Client and (Web) server model.

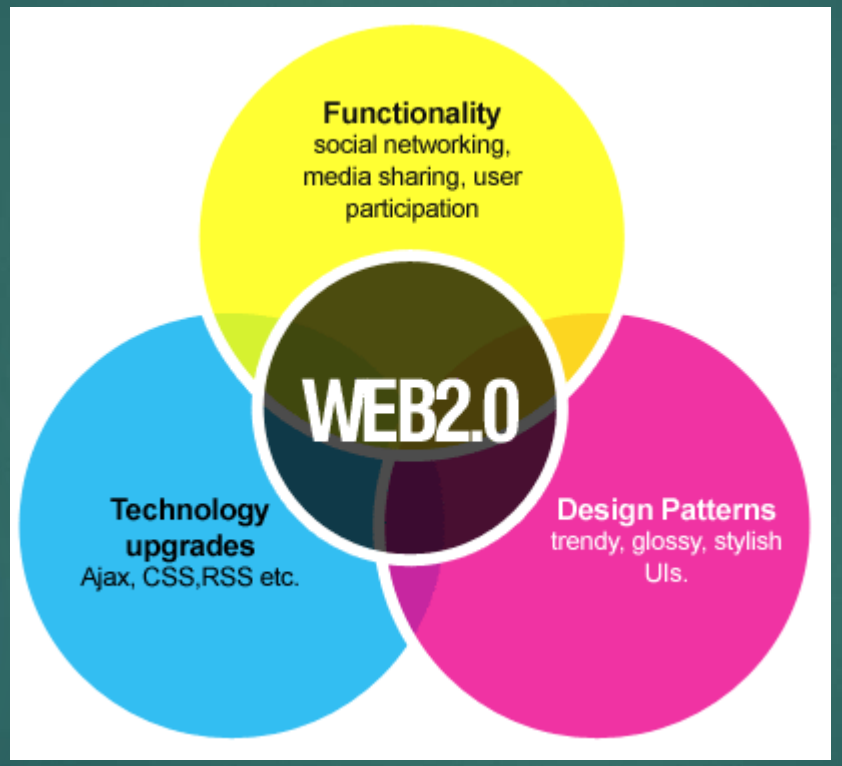
Server Choice

1. Apache HTTPd Server from the Apache Project.
2. Internet Information Services (IIS) from Microsoft.
3. Personal Web Server from Microsoft (superseded by IIS).
4. Sun Java System Web Server (formerly Sun ONE Web Server) from Sun Microsystems.
5. Zeus Web Server from Zeus Technology.
6. Abyss Web Server from Aprelium Technologies.
7. AOL server from America Online, open source.
8. BEA WebLogic from BEA Systems.
9. Light tpd.

Testing

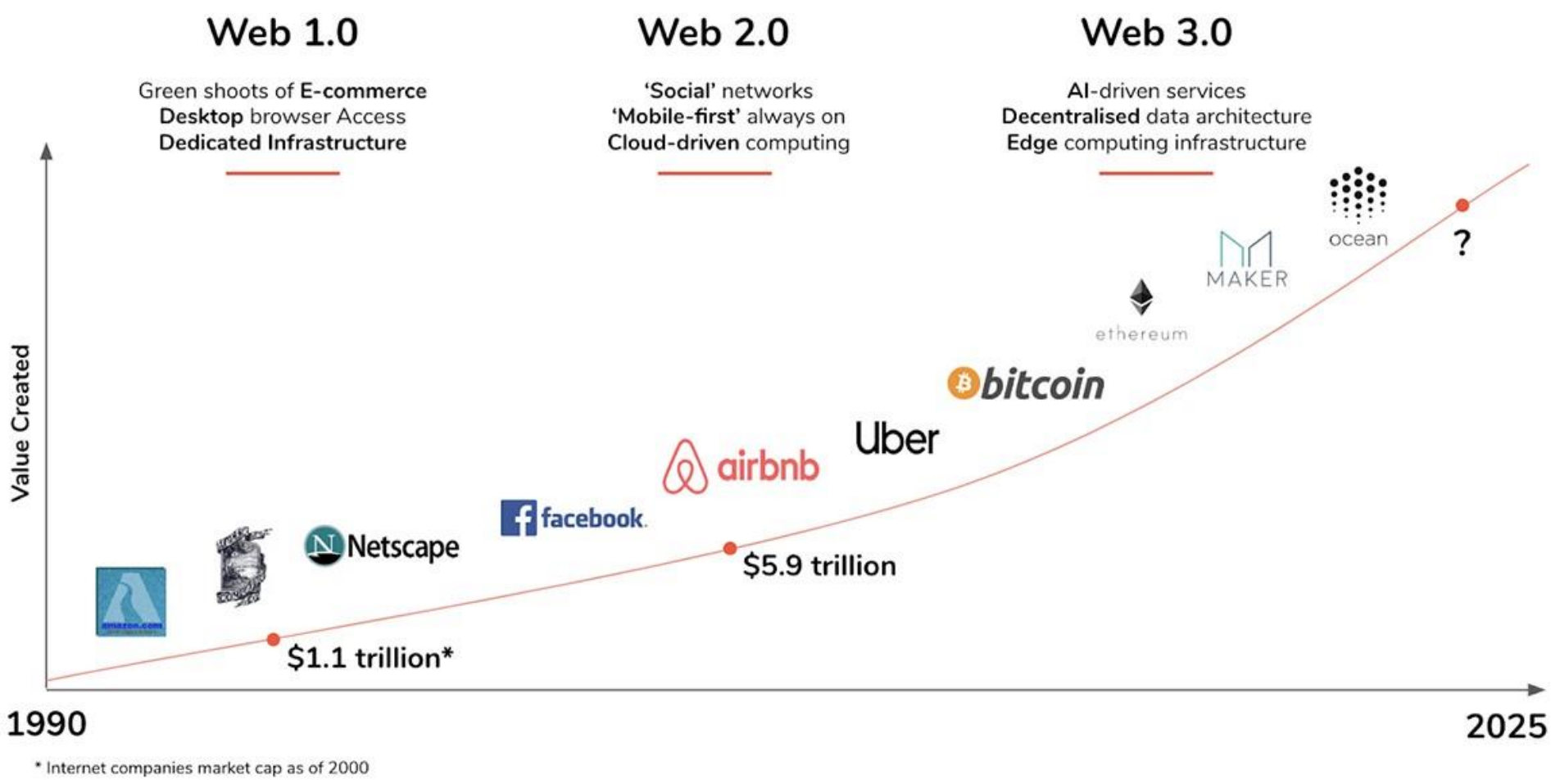
- Localhost
- 127.0.0.1
- Logical IP

Web 2.0


Functionality
social networking, media sharing, user participation
WEB2.0
Technology upgrades
Ajax, CSS,RSS etc.
Design Patterns
trendy, glossy, stylish UIs.

The Evolution of the Web

FABRIC VENTURES



Web3, also known as Web 3.0, is **an idea for a new Internet that incorporates decentralisation based on Block chain**.

Web 1.0 / 2.0 / 3.0 Summary

Crawl	Walk	Run
Web 1.0	**Web 2.0**	**Web 3.0**
Mostly Read-Only	Wildly Read-Write	Portable & Personal
Company Focus	Community Focus	Individual Focus
Home Pages	Blogs / Wikis	Lifestreams / Waves
Owning Content	Sharing Content	Consolidating Content
Web Forms	Web Applications	Smart Applications
Directories	Tagging	User Behavior
Page Views	Cost Per Click	User Engagement
Banner Advertising	Interactive Advertising	Behavioral Advertising
Britannica Online	Wikipedia	The Semantic Web
HTML / Portals	XML / RSS	RDF / RDFS / OWL

Designing an Effective Web Site

- Web Site Design Issues
- Planning a Website
- Navigation

Web Site Design Issues

1. Browser and operating Systems

- Different web browsers and their versions affect the way a page is rendered
- Older version browsers
- e.g. CSS Not supported by older browsers
- Different view in different OS
- W3C Standard

Web Site Design Issues

2. Bandwidth and cache

- User have different bandwidth
- No patience to wait for 10-15 seconds
- Temporary memory is called cache to store graphics

Web Site Design Issues

3. Display Resolution

- 800 x 600
- 1024 x 768
- FHD
- 4K
- 8K
- Flexible design to fit in different resolution

Mobile Tablet Desktop

Web Site Design Issues

4. Look and Feel

- Website theme
  - Use logo of the company
  - Color scheme
  - Message related to firm e.g. global warming slogan
- Fonts, Graphics and colors
  - Different fonts have different readability affect the user psychology
  - Maintain consistency of text
  - Height, width , line ending, spacing, paragraph boundaries
  - Availability of fonts visitors machine, if not by default font displayed

Web Site Design Issues

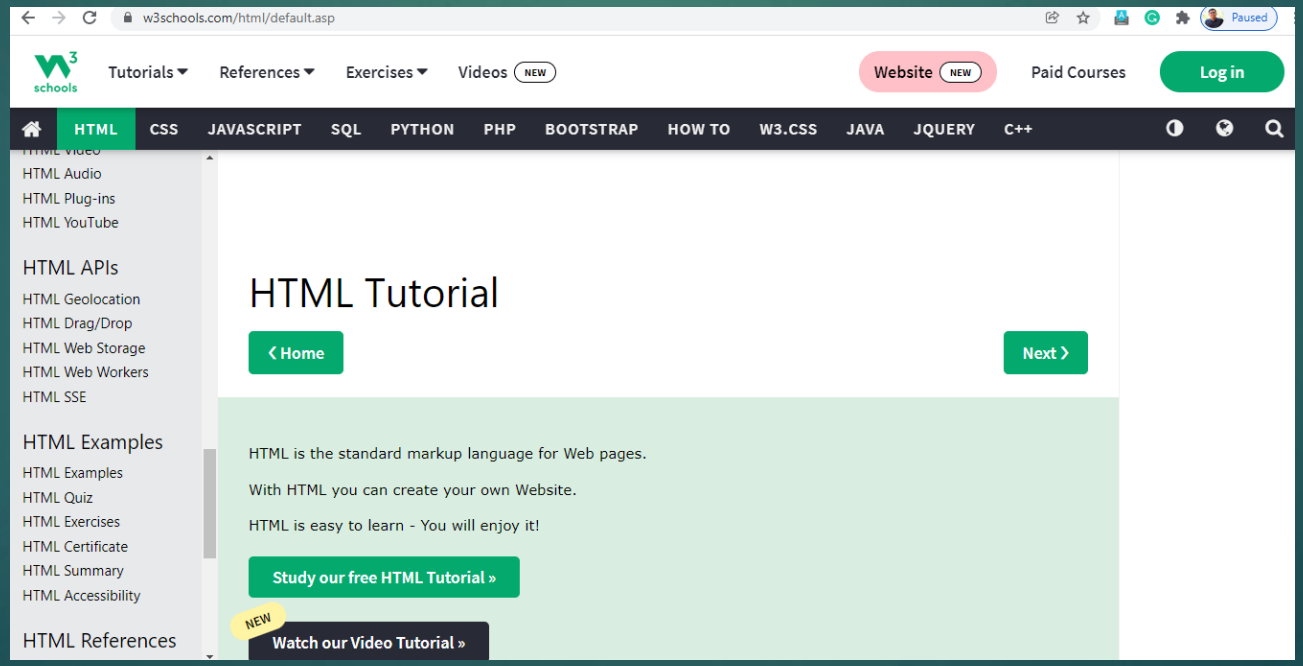
4. Look and Feel

- Presentation and access
  - Web page divided in visually different area to present the contents with different importance.
  - Make different parts of the page visible by using white spaces
  - Keep page simple and focused if required
  - Do not overload to much content
  - Don't make page to lengthy, if designed such page, then provide link to top of the page or bottom of page.
  - Links between pages and section should exhibit consistency in appearance and meaning
  - Navigation transition between pages, should reflect the consistency

Web Site Design Issues

5. Page Layout and linking

- Website consists of individual web pages that are linked together using various navigation links



Web Site Design Issues

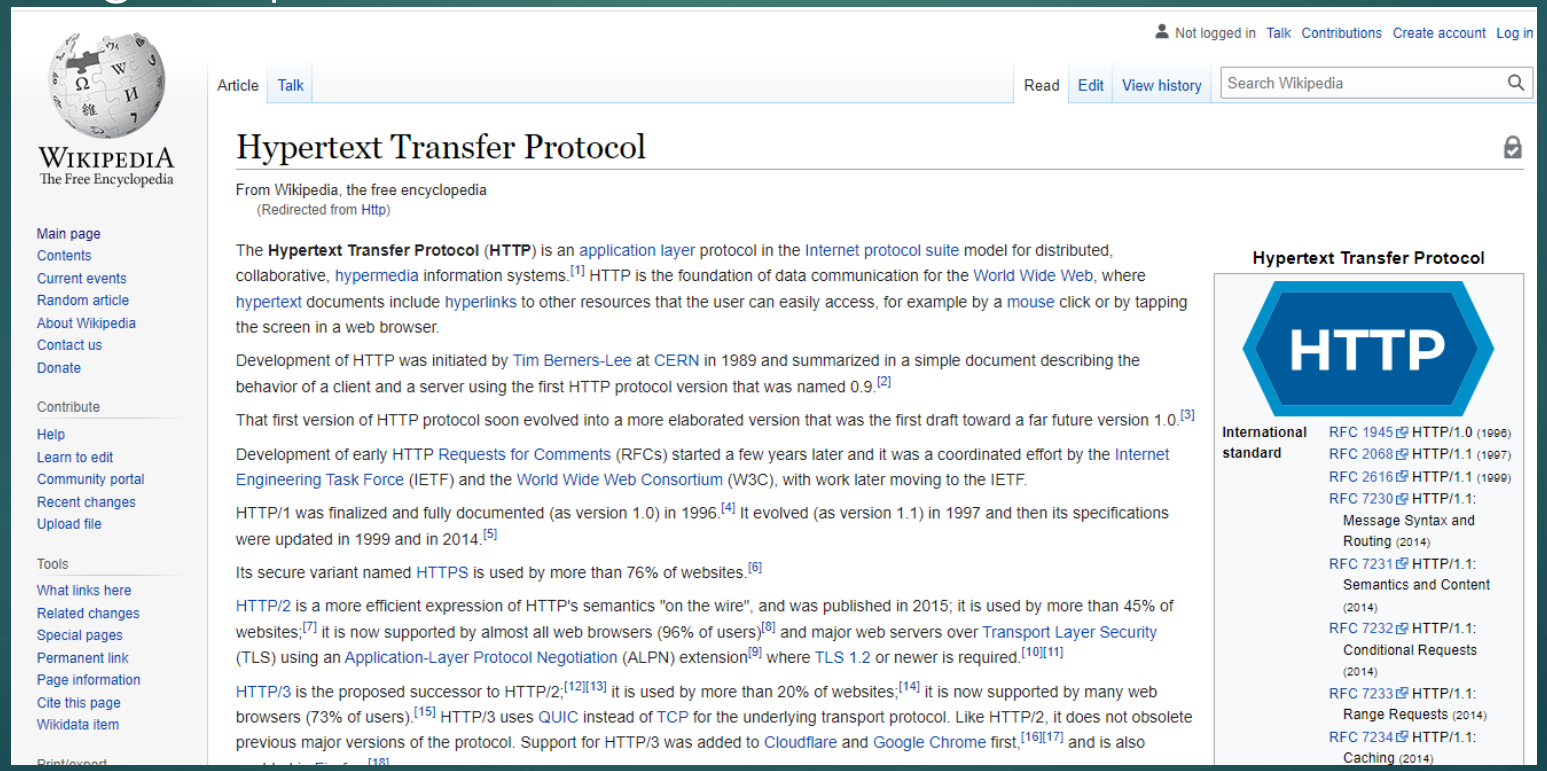
6. Locating Information

- Center, Top, Right, Bottom and Left.

Web Site Design Issues

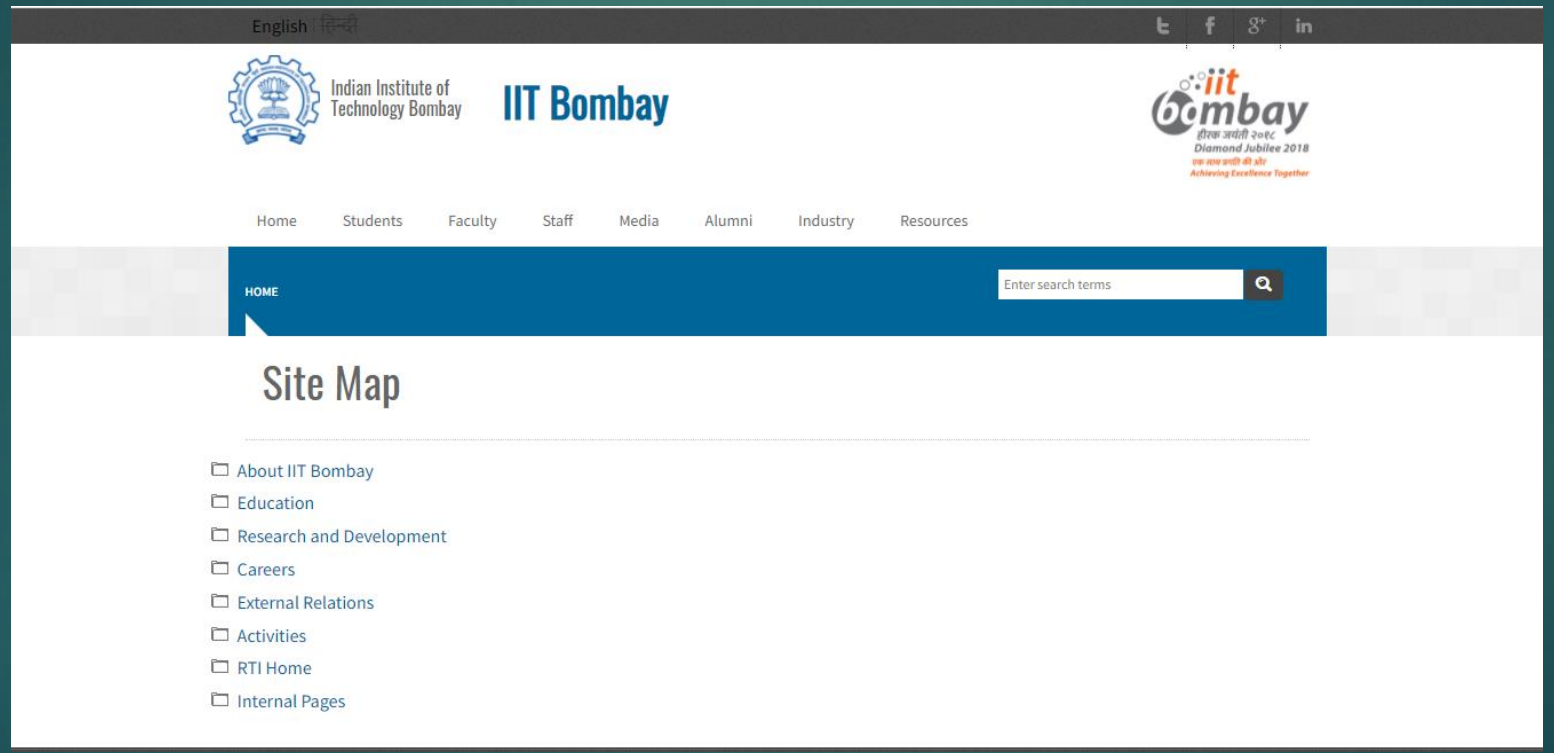
7. Make design User Centric

- Left to right, top to bottom



Web Site Design Issues

8. Sitemap



Planning a Web site

- Why are we developing this website?
- What do we achieve by developing this website?
- Who are the people who will use this website?
- What are the information contents?
- How are these contents organized? What are the possible ways?
- How the files prepared are organized?

Planning a Web site

1. Objective and Goal
2. Audience / User profile
3. Identifying and Organizing contents
4. Towards the publishing of web site

Planning a Web site

1. Objective and Goal
   - Objective must clear
   - benefit

Planning a Web site

2. Audience / User profile

- Children website
- Technology savvy
- Music
- Common users

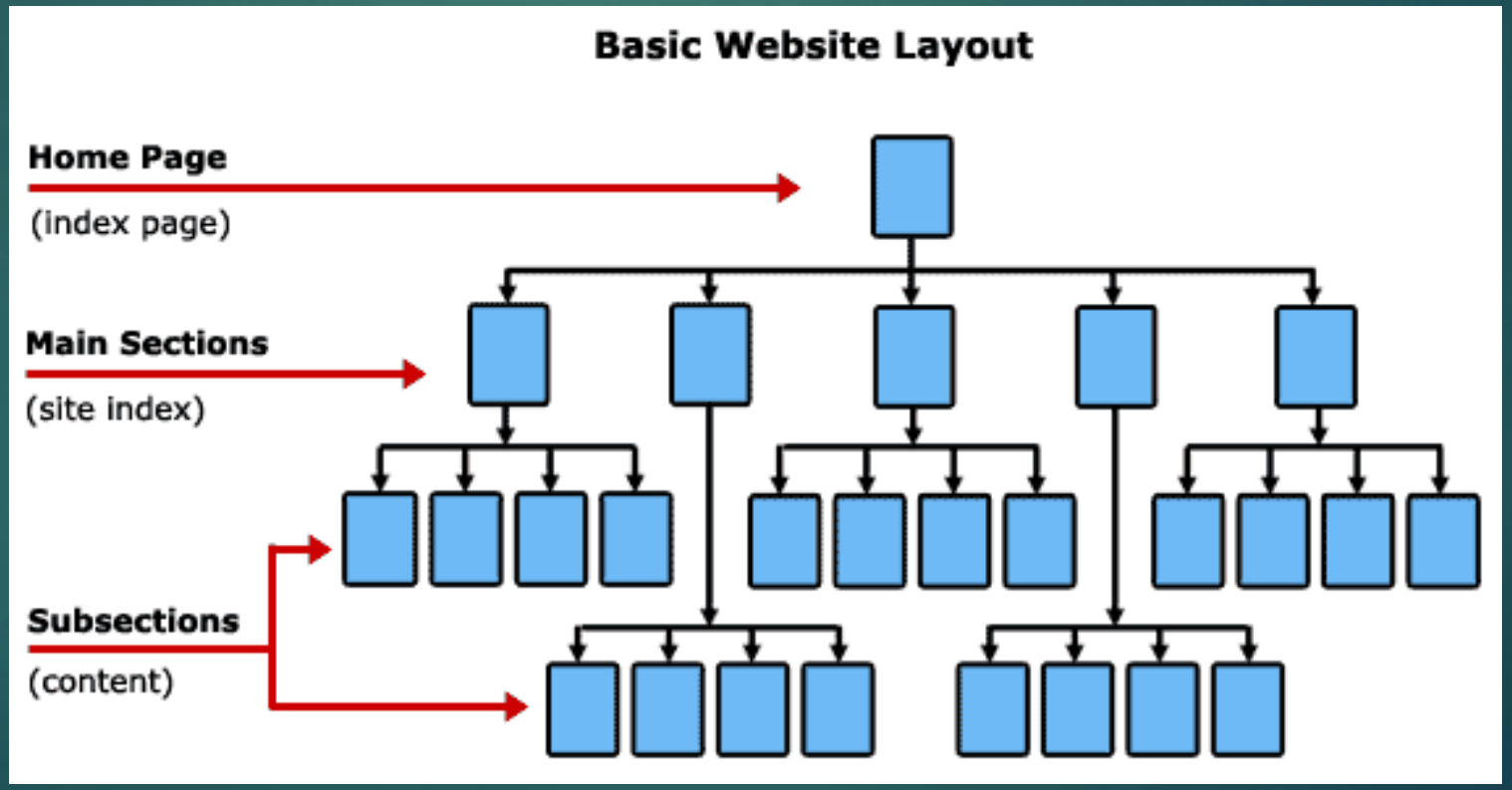
Planning a Web site

3. Identifying and Organizing contents

- Contents include text, graphics, forms, sound and video.
- Contents should be unambiguous, clear, spell, checked, precise and accurate.
- Contents should be relevant, recent and matching to site objective.
- Contents should fulfil the information need of the users.
- Contents should be well organized.

Planning a Web site

3. Identifying and Organizing contents



Planning a Web site

4. Towards the publishing of web site

Implement each page using various technologies

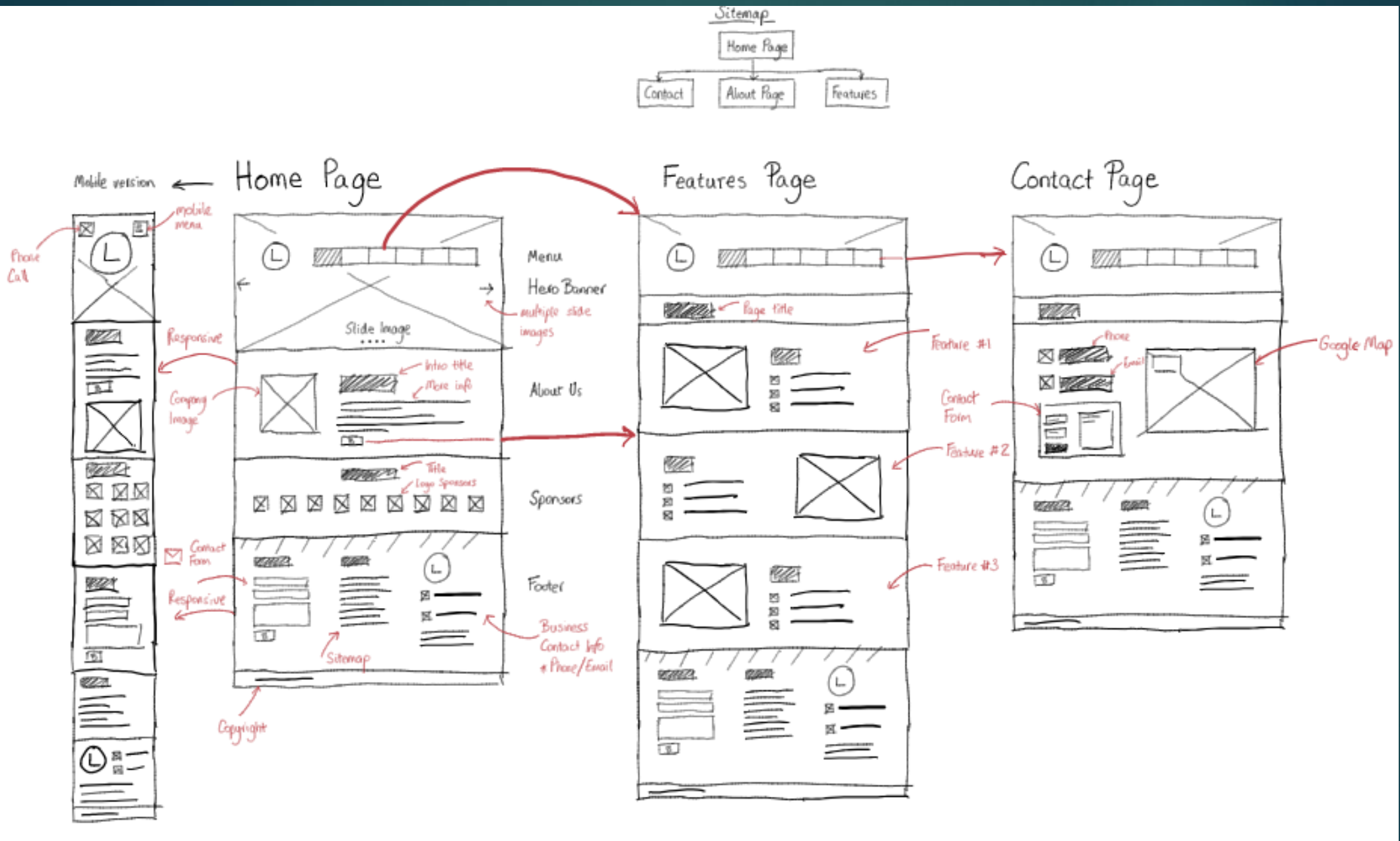
Organize the files containing your web pages and other contents images, script

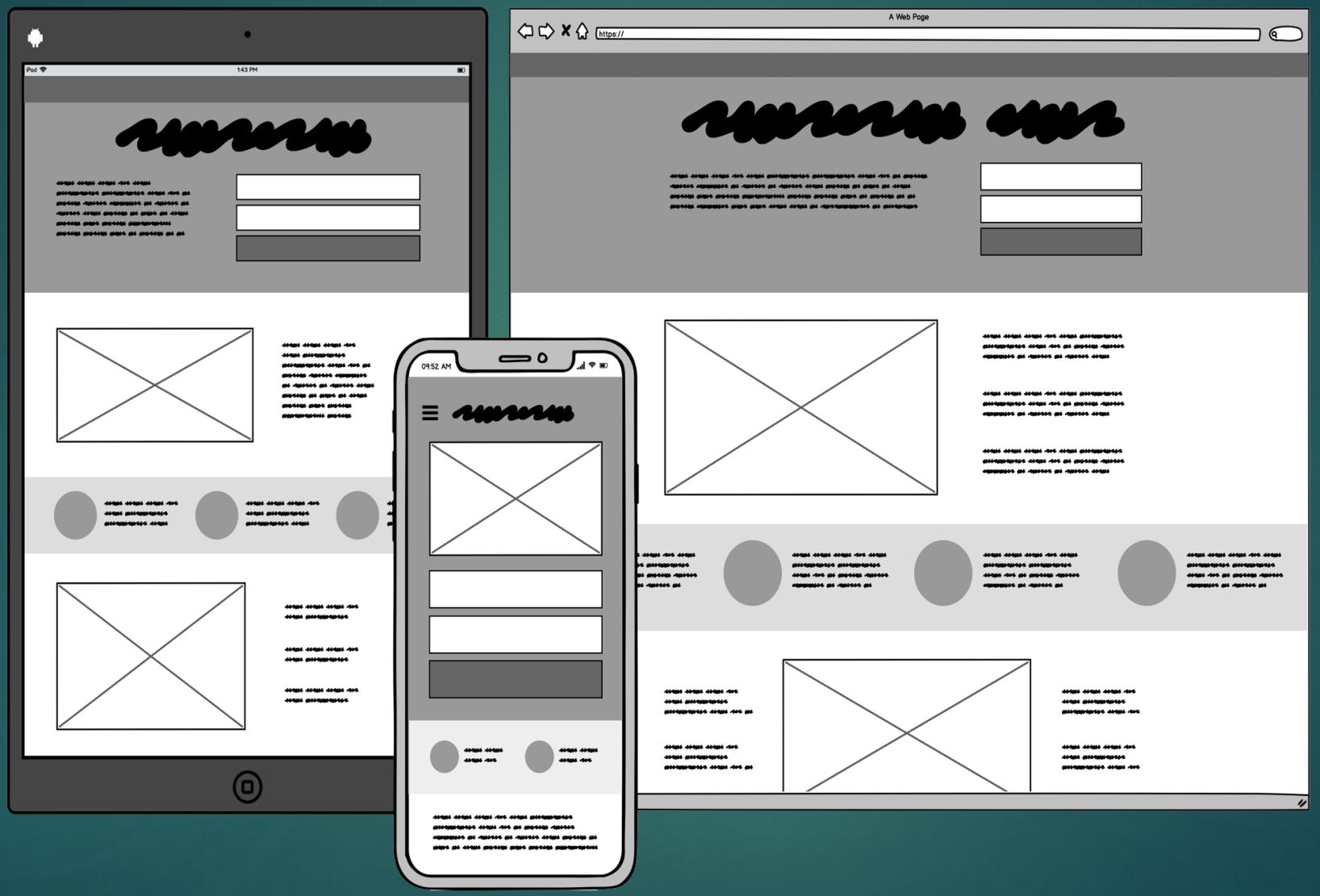
Test your individual pages

Register your domain

Upload your website on web server

Access your website form any browser


Sitemap
Home Page
Contact
About Page
Features
Mobile version
Home Page
Features Page
Contact Page
mobile menu
Phone Call
Responsive
Company Image
Contact Form
Responsive
Copyright
Menu
Hero Banner
multiple slide images
Slide Image
Intro title
More info
About Us
Title
Logo Sponsors
Sponsors
Footer
Sitemap
Business Contact Info + Phone/Email
Page title
Feature #1
Contact Form
Feature #2
Feature #3
Phone
Email
Google Map


A Web Page
https://
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Navigation

- Navigation links are either text based, i.e. word or phrase is used as link or graphical images, icon or logo is used as a link.
- Navigation links should be clear and meaningful.
- It should be consistent.
- Link should be understandable.
- Organize the links such that contents are group logically.
- Provide search link, contact us, about us
- Provide way to return page from anywhere using link ‘Home’
- Provide the user with information regarding location. i.e. where is she/he?
- Website having many clear sections, provide navigation menu.
- Horizontal or vertical navigation bar can be provided.