

*Title:*

*“Front end Web development for accessible websites”*

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# The network

Beginning with the network definition based on computer science since, it is the foundation of all the above technologies that rely on network connections. “*A network****consists of two or more computers that are linked in order to share resources (such as printers and CDs), exchange files, or allow electronic communications****. The computers on a network may be linked through cables, telephone lines, radio waves, satellites, or infrared light beams.*(Anon, n.d.).

Nowadays, networks are almost everywhere on the planet. Starting from the internet and the World Wide Web to various networks in economics, disease transmission or even terrorist networks. Moreover, the last three decades, computer systems prices have significantly declined thus, more consumers can purchase one, leading to increased availability and usability of a network usually via the internet in the world wide web. (Newman et al., 2006)

# The Internet

Starting with the basic, the internet is a network interface connection that utilizes technology to permit computer systems and other electronically smart devices and equipment such as smartphones, tablets and various other devices such as televisions or smart TVs to interact globally online. It is a powerful form that allows quick access to data and information worldwide. Also, it provides an entry to businesses and organizations to manage and conduct electronic commerce or e-commerce without the physical presence of users in a specific location.(Anon, n.d.)

The internet protocol is a technology that initially was built upon to allow access for companies to create and manage systems for file transfers, electronic mail (email) and have access to remote distribution locations. Around the mid-1990s, internet had donated to the growth of international market via electronic transactions thus, reducing decision making time through expanded access to information and data. Ultimately this eliminated many distributions channeling costs of production in many businesses. Some crucial contributions include banking, music, pharmaceuticals, and stocks. As of today, advertising via internet is an important attribute of conducting business.

A significant and perhaps revolutionary changes that internet has brought is social interaction online. This new form of communication has a vast impact to people’s lives. It has contributed a lot to individuals with disabilities to expand the accessibility of information to as many as possible. In addition to that, this includes employment, resources such as the cloud. Moreover, internet had a massive impact on education. Users, can now have much greater access of information just about any topic there is thus, leading to enhanced decision making and exposure to a variety of issues and experiences.

As mentioned earlier, internet has also affected the professional and work-related structure therefore, many low skilled occupations are eliminated especially in the primary sector where manufacturing is involved. This effect occurs because there is an increasing demand in personal and information services such as cloud computing. According to the National Institute of Standards and Technology or NIST, cloud computing is defined as “*A model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction*”. (Wang et al., n.d.). This revolutionary technology represents a new form of computing technology with the ability to provide access to work on, share and save information using the internet.

# World Wide Web

The World Wide Web is a hypertext system for publishing information on the internet. It was developed in the United Kingdom by the academic and research scientist Tim Berners-Lee while working at the CERN particle physics laboratory in Geneva in 1989. He also created the first Web client (browser editor) and server in 1990.(Anon, n.d.)

The World Wide Web Documents or Web Pages are text files coded using HTML to include text and graphics, stored on a Web server connected to the Internet. HTML or Hypertext Mark-up Language is the standard for developing and publishing a document on the World Wide Web. It provides labels for different elements of a document such as paragraphs and headings while allowing the inclusion of images, graphics, sounds and ‘hyperlinks’ that lead to other documents when pressed by the user whether using the cursor of the operating system or touch input for touch enabled devices such as tablets. (Anon, n.d.)They can also contain dynamic objects and Java applets for better animation, sound or video and interactivity. This makes a web page more beautiful to interact with but also, users with disabilities can easily take advantage of these technologies. For instance, the text can be bigger, with more contrast or there is a automated reader that reads the text to hear it (this can be very useful for people with vision problems). In addition to that, a browser, which is a program that is utilized to convert the information of the document into a graphical text onscreen. An HTML webpage can be created with the assistance of a proprietary WYSIWYG software or a simple text editor. What you see is what you get is a catchphrase coined by Flip Wilson in 1969. In computer systems it means a system where the screen displays text and graphics almost exactly as it would be printed. There may be minor differences in resolution and fonts used. WYSIWYG is considered to be a desirable feature of [word processing](https://www-oxfordreference-com.ezproxy.bolton.ac.uk/view/10.1093/acref/9780199688975.001.0001/acref-9780199688975-e-5846), [desktop publishing](https://www-oxfordreference-com.ezproxy.bolton.ac.uk/view/10.1093/acref/9780199688975.001.0001/acref-9780199688975-e-1375), and other programs where the appearance of the final printed product is important.(Anon, 2016)

As of 1999 the World Wide Web or “Web” for short has over 800 million pages linked together in a seemingly disorganized topology scattered over the Western Hemisphere and Western Europe. Web pages are located in a server or a host computer that permits general access for other internet enabled devices to be connected to the host network.

*“The largest network, the internet, is a collection of many other networks that are interconnected via common network protocols.”* (Anon, n.d.)

# User Interface and User Experience

User experience is about usability of products and services. An example of this are websites. There are good, meaning useful, easy to interact with webpages and there are those that either have too much content disorganized making them not user friendly. Basically, this form of design puts the people first ahead of the design creating product that are easy to use and enjoyable. (Bowles & Box, 2010)

Moreover, users who use computers, smartphones, or other devices capable of connecting online to the internet and visit a webpage, they expect to see a site name, logo, perhaps a navigation bar, other links and maybe a search box. For instance, when shopping online via an e-commerce website it is expected to see a familiar layout with all the elements previously mentioned and perhaps a virtual shopping basket with the use of an icon, price comparison option, price limit, price tags, discounted products, and advertisements. (Johnson & Johnson, 2014)

Since the use of perceptual frames, users do not have to be familiar with all possible websites or software programs because they tend to follow a similar design principle. Their perception of the screen is based upon on what their frame for the situation led them to expect rather than on what is actually being displayed. Software designers tend to see what is on the screen, but human vision works the opposite way. (Johnson & Johnson, 2014)

# Accessible Websites

As mentioned earlier many people use the internet and more specifically the world wide web or (WWW) to search and discover information. Thus, it is crucial that all websites are accessible to all including people with disabilities. Therefore, with increasingly more resources being stored digitally, the inability to access the web is more likely to have a detrimental impact on one’s ability to function independently.

Also, promoting access to the web for individuals with disabilities, guided the development of internationally recognized standards by the Web Accessibility Initiative of internationally recognized standards or (WAI). (Waight & Oldreive, 2016) WAI is *“a comprehensive program, including specifications, tools, research and development, and education, that is designed to make the Web more accessible to people with limited vision, hearing, or dexterity. The program is sponsored by the World Wide Web Consortium (W3C). “*The World Wide Web Consortium is “*an independent standards body composed of university researchers and industry practitioners that is devoted to setting effective standards to promote the orderly growth of the World Wide Web. Housed at the Massachusetts Institute of Technology (MIT),W3C sets key Web standards such as Hypertext Markup Language (HTML), the Hypertext Transport Protocol (HTTP), Cascading Style Sheets (CSS), Extensible Markup Language (XML), and many other aspects of Web usage. See*[*CSS*](https://search-credoreference-com.ezproxy.bolton.ac.uk/content/entry/webstercom/css/0)*,*[*HTML*](https://search-credoreference-com.ezproxy.bolton.ac.uk/content/entry/webstercom/html/0)*,*[*HTTP*](https://search-credoreference-com.ezproxy.bolton.ac.uk/content/entry/webstercom/http/0)*,*[*XML*](https://search-credoreference-com.ezproxy.bolton.ac.uk/content/entry/webstercom/xml/0)*”*. (Anon, 2003)

This has separated to people with being obstructed by a physical or sensory disability and users with cognitive and learning disabilities. For instance, those with learning difficulties have different abilities and skills thus a wide range of needs. Thus, the W3C has issued the *“User Agent Accessibility Guidelines”* or (UAAG). The W3C recommends that accessibility features needed in browsers and multimedia players to access the web indicating that, the specification is stable, contributes to the web interoperability and has been reviewed by the W3C Membership. The “User Agent Accessibility Guidelines Working Group (UAWG)” has produced techniques for UAAG, “*enabling developers, users and purchasing agents to assess the extent of accessibility improvements in Web software”.* (Anon, 2002).

The Department of Trade & Industry recommends that website design consider the following issues:

* Text and graphic links. Not all users choose to view websites using graphics and many are unable to access images at all. For example, some users may have small-screen browsers that only display text.

Therefore, it is advisable to use alternative text to describe the content of a picture. This can be useful for text-based browsers and/or for users with visual impairments.

* Use of cascading style sheets. This is a method of producing web pages which makes it easy for a user to override the author's website page settings and make it easier for them to view the page, for example, by changing the color of the text or the background. Developers can test web pages for accessibility utilizing a web accessibility evaluation tool, such as WAVE.(Javaid, 2003)

Furthermore, the type of disability a user has, has a massive impact on his or her ability to access information found on a normal webpage. This can also affect the type of adaptive technology someone uses to view a website. Thus, there are some categories that developers can address to such as, individuals with visual disabilities, physical or motor disabilities, hearing disabilities and learning disabilities. (Lilly, 2001) Finally, those standards have remained since the beginning of UAAG first version back in 2002.

# Research Objectives

The objectives of the current undergraduate project are:

* An exploration of the terms and definitions, brief history and other important elements of Network, the Internet and the World Wide Web, various web development languages and the principles of WAI and UAAG.
* The use and explanation of HTML and CSS technologies on front end web development, including accessibility tools that can adapt to the user’s needs.
* An implementation of a functional Webpage with accessibility in mind containing information about technology news. It will be focused on people with vision problems

# Research and Development method

The research will be conducted based on books, the internet, and Academic journals from trustworthy sources such as Bolton library and Google Scholar. As concerned about the website, it will be created using an integrated development environment using HTML as primary web development programming language and CSS as secondary mostly for accessibility elements.

# Project Timeline

1. Research and brainstorming ideas and gathering content and resources 15/10/2021
2. Implementing the above to the Proposal writing about 2000 words about this project with a deadline up to 17/11/2021
3. Finishing the proposal presentation 17/11/2021
4. Begin Creating the Webpage 20/10/2021 with a deadline up to 30/4/2022
5. Begin writing the full Undergraduate Research Project based on this proposal as a continuum 20/10/2021 with a deadline up to 30/4/2022
6. Final Presentation deadline up to 30/4/2022

# Resources

* Books, journals and websites from trustworthy sources such as from Bolton university library
* Word Processor
* Integrated development environment

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