

ADDIS ABABA UNIVERCITY

ADDIS ABABA INSTITUTE OF TECHNOLOGY

CENTER OF INFORMATION TECHNOLOGY AND SCIENTIFIC COMPUTING

**DEPARTMENT OF** SOFTWARE ENGINEERING

**EVOLUTION OF THE ENTERNET**

**Prepared By:** Biruk Kassaw – atr/2802/11

**Submitted To:** Mr. Fitsum Alemu

May 2020

# History of the Internet

## Introduction

The Internet is a massive network of networks, a networking infrastructure. It connects millions of computers together globally, forming a network in which any computer can communicate with any other computer as long as they are both connected to the Internet.

By definition the [Internet](https://en.wikipedia.org/wiki/Internet) is a worldwide, publicly accessible series of interconnected [computer networks](https://en.wikipedia.org/wiki/Computer_network) that transmit [data](https://en.wikipedia.org/wiki/Data) by [packet switching](https://en.wikipedia.org/wiki/Packet_switching) using the standard [Internet Protocol](https://en.wikipedia.org/wiki/Internet_Protocol). How did this technology come to be so popular and so widely used around the world? Was it always so large and extensive, filled with information about just about anything you can possibly imagine and accessible from almost anywhere, anytime? The answer is no and it is important to understand where it came from to understand how to utilize it to its fullest potential now. In this section we will see the history of the Internet from the beginning to what it is today.

## Creation

The Internet’s origins have their roots in a military project, the Semi-Automatic Ground Environment (SAGE) program in USA, which networked country-wide radar systems together for the first time. This was created around 1958 as part of an attempt to regain the lead in technology from the Soviet Union which had recently launched Sputnik (the first man-made satellite to orbit the earth).

J.C.R. Licklider was selected to head the committee which controlled the SAGE project. He envisioned universal networking as a unifying human revolution. Licklider recruited Lawrence Roberts to head a project which implemented a network. Roberts had worked with the U.S. Air Force on a [packet switching](https://en.wikipedia.org/wiki/Packet_switching) system as opposed to a [circuit switching](https://en.wikipedia.org/wiki/Circuit_switching) system. On October 29, 1969, Licklider and Roberts interconnected the first two nodes between UCLA and SRI International at Menlo Park, California. This was the beginning of the [Advanced Research Projects Agency Network (ARPANET)](https://en.wikipedia.org/wiki/ARPANET) which was one of the key networks which our Internet today was based off of. Soon after the first international packet-switched network service was created between U.S. and U.K.

[Vint Cerf](https://en.wikipedia.org/wiki/Vint_Cerf) and [Bob Kahn](https://en.wikipedia.org/wiki/Bob_Kahn) developed the first description of [TCP](https://en.wikipedia.org/wiki/Transmission_Control_Protocol) (covered more deeply in the Introduction to Networking lesson) in 1973. The term “Internet” was first used in 1974 to describe a single global TCP/IP network detailed in the first full specification of TCP written by Cerf and his colleagues. The first TCP/IP-wide area network was created on January 1, 1983 when all hosts on the ARPANET were switched over from the older protocols to TCP/IP.

In 1984, the [National Science Foundation (NSF)](https://en.wikipedia.org/wiki/National_Science_Foundation) commissioned the construction of a 1.5 megabit/second network which became known as [NSFNET](https://en.wikipedia.org/wiki/National_Science_Foundation_Network). In 1989 the US Federal Networking Council approved the interconnection of the NSFNET to the commercial [MCI Mail](https://en.wikipedia.org/wiki/MCI_Mail) system.

Soon after, other commercial e-mail services were connected such as OnTyme, Telemail, and [CompuServe](https://en.wikipedia.org/wiki/CompuServe). Three [Internet Service Providers (ISPs)](https://en.wikipedia.org/wiki/Internet_service_provider) were also created: [UUNET](https://en.wikipedia.org/wiki/UUNET), [PSINET](https://en.wikipedia.org/wiki/PSINet), and [CERFNET](https://en.wikipedia.org/wiki/CERFnet). More and more separate networks were created that eventually interconnected with this large, growing network of networks.

The ability of TCP/IP to work over virtually any pre-existing communication networks allowed for a great ease of growth, although the rapid growth of the Internet was due primarily to the availability of commercial routers from companies such as [Cisco Systems](https://en.wikipedia.org/wiki/Cisco_Systems), Proteon and [Juniper](https://en.wikipedia.org/wiki/Juniper_Networks), the availability of commercial [Ethernet](https://en.wikipedia.org/wiki/Ethernet) equipment for local-area networking and the widespread implementation of TCP/IP on the [UNIX](https://en.wikipedia.org/wiki/Unix) operating system.

# guidelines for evaluating the value of a Web site

With increased access to the Internet, Web sites are becoming popular educational resources. Not every site makes a good resource, so how does one decide whether a site is worth using? Because of the inconsistency of information on the Internet, it is very important to develop evaluation skills to assist identifying quality Web pages.  There are four (4) basic criteria that should be applied when evaluating any Web site:***content quality***, ***design quality***, ***organization quality***, and ***user-friendly quality*.**  For each criterion, there are several sub-criteria.  The more questions the answer is "yes", the more likely the Web site is one of quality.

## Content Quality

It is generally agreed that quality of the content is an important criterion which deals with the characteristics of websites’ information. The following indicators and check elements are the most important relating to the content quality criterion:

### Authority

Authority reveals that the person, institution or agency responsible for a site has the qualifications and knowledge to do so. Evaluating a web site for authority:

* Authorship: It should be clear who developed the site.
* Contact information should be clearly provided: e-mail address, phone number, and fax number.
* Credentials: the author should state qualifications, credentials, or personal background that gives them authority to present information.

### Purpose

The purpose of the information presented in the site should be clear. Some sites are meant to inform, persuade, state an opinion, entertain, or parody something or someone. Evaluating a web site for purpose:

* Does the content support the purpose of the site?
* Is the information geared to a specific audience (students, scholars, general reader)?
* Is the site organized and focused?
* Are the outside links appropriate for the site?
* Does the site evaluate the links?

### Coverage

It is difficult to assess the extent of coverage since depth in a site, through the use of links, can be infinite. One author may claim comprehensive coverage of a topic while another may cover just one aspect of a topic. Evaluating a web site for coverage:

* Does the site claim to be selective or comprehensive?
* Are the topics explored in depth?
* Compare the value of the site’s information compared to other similar sites.
* Do the links go to outside sites rather than its own?
* Does the site provide information with no relevant outside links?

### Timely

Timely of the site refers to:

* how current the information presented is? how often the site is updated or maintained. It is important to know when a site was created, when it was last updated, and if all of the links are current. Evaluating a web site for currency involves finding the date information was:
* first written
* placed on the web
* last revised

Then ask if:

* Links are up-to-date?
* Links provided should be reliable. Dead links or references to sites that have moved are not useful?
* Information provided so trend related that its usefulness is limited to a certain time period?
* the site been under construction for some time?

### Objectivity

Objectivity of the site should be clear. Beware of sites that contain bias or do not admit its bias freely. Objective sites present information with a minimum of bias. Evaluating a web site for objectivity:

* Is the information presented with a particular bias?
* Does the information try to sway the audience?
* Is the site trying to explain, inform, persuade, or sell something?

### Accuracy

### There are few standards to verify the accuracy of information on the web. It is the responsibility of the reader to assess the information presented. Evaluating a web site for accuracy:

* Is the information precise there is no spelling errors or grammar, and the sources of information is identified?

## Design Quality

This dimension concerns the visual characteristics of websites’ design that attracts the users and encourages them to stay longer time viewing the website and re-enter it. The following indicators and check elements are the most important relating to the design quality dimension:

### Aesthetics

Some say beauty is relative, but that does not mean that there are not defined aesthetic principles that should guide website design. The best type of design will align with the brand, create a positive impression for visitors, be clean, and it will complement the content that is being communicated. To test the effectiveness of the website's aesthetic, ask the following:

* Does the website's style align with the brand in terms of color, graphics, feel, etc.?
* Is the style consistent throughout the entire website?
* Does the style suit the target audience? (An elegant layout on the website, cartoons on a toy company website etc.)
* How do visitors view the site? Sparse or crowded, orderly or messy, formal or playful? And how does this align with the goals?
* Are there any photos or decorative touches that are getting in the way of the message?

### SEO and Social Networking

There are a lot of ways that the design of a website will impact search engine optimization. SEO and social networking start with a strong website design. For example, does the website have a lot of graphics? If it does, remember that the search engines cannot see them. You will need to add ALT tags to the image descriptions so that the search engine will know what is being shown. Is the HTML efficient? If it is not this will hurt search rankings. Consider asking the following questions to ensure that the website design is optimized:

* Are all of the images optimized with ALT tags?
* Is the coding efficient or are there extra lines that can be eliminated?
* Are relevant keywords being used in title tags, heading tags, meta-descriptions, etc.?
* Is there a site map?

### Responsiveness

Responsiveness means that the web content or layout is flexible to fit within the different screen sizes where they are displayed. If you are watching a website on desktop, the layout might be different from that of mobile. The smaller the screen of the browser you are on, the more the site will adjust to the adjusted screen size. Consider asking the following questions to ensure that the website design is responsive:

* Is there loss of information for smaller sized devices?
* Is it similar in its content for different sized devices?
* Is it Aesthetic(attractive) for different sized devices?

## Organization Quality

This quality concerns the logical grouping, categorization, or structure of websites’ elements in order to help the user to reach the required information quickly, navigate easily, feel comfortable within its layout consistency, and keep informative that he/she is still in the same website. The following indicators and check elements are the most important relating to the organization quality:

* Is there an index or links to all the website’s pages is available from the main page?
* Is Adequate website map or navigation bar/menu available? Does a user can know the current page that he/she is in?
* Is the organization logo noticeable in every page of the website?

## User-friendly Quality

The term user-friendly seems self-explanatory.When something is user-friendly, it is easily workable and accessible to others. The following indicators and check elements are the most important relating to the user-friendly quality:

### **Learnability**

This is how easy people find your site the first time they encounter it.

* Can they find what they want easily? Can they understand the structure and the design? Having complex designs can push people away.

### **Errors**

A user-friendly website means taking away as many possible errors, and making sure users know how to recover if they do make an error.

* Are the errors addressed properly? For example, if someone types in an address on the website that doesn't exist, does it have a 404-error page that tells them the page doesn't exist, possibly have suggestions for them.

# Reference

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