



Cyberspace measurements

Defining Cyberspace

The term "cyberspace" first appeared in 1984.

It originated in the science fiction novel *Neuromancer* by William Gibson and is associated with virtual communities and computer networks (including the Internet).

Cyberspace has been defined as the virtual realm through which all forms of communication technology—wired and wireless, digital and analog, space-based and non-space-based, etc.—operate. The Internet is often referred to as cyberspace—a term used metaphorically in this context—and from a philosophical perspective regarding the nature of cyberspace...

Therefore, electronic justice is the domain that allows for direct interaction with interconnected computers in a global network. These computers carry information sources that humans can navigate within the virtual or digital realm. It is a term currently used to describe the domain in which information moves and is exchanged using computers. It is a domain controlled by companies from interconnected computers. Thus, it is metaphorically applied to the internet, which is the network of networks.

It has been given various names, some of which are cyberspace.

Some of these names derive from their defining characteristics. For example, virtual space or the virtual realm. Others come from names established within this spatial domain, such as Internet space and Gopher space, where information accessed through the Gopher is said to float in Gopher space.

Some are also called hyperspace, hyperbaric space, or hyper-space. Regardless of the name, they all refer to the same thing: the realm where all informational, social, scientific, and entertainment activities take place. The term "electronic space" is preferred here because it is the most comprehensive, encompassing all the aforementioned terms that describe this single entity.

When metrics were applied to the concept of "cyberspace," they acquired various names—mirroring the diverse terminology used for "cyberspace" itself—but with the word "space" omitted. For instance, they were termed "Internet metrics" (rather than "Internet cyberspace metrics") or "Web metrics" (rather than "Web space metrics") or "information network metrics," and so on. Alternatively, they were all consolidated under a single term: "electronic metrics" (*-metrics*). The sole exception is the term "cyberspace" itself, to which the word "metrics" was simply added without removing any part of the original term.

The question that naturally arises now is: Do these cyberspace-related metrics fall within the field of library and information science? The answer is unequivocally yes.

Evidence for this can be found in two aspects.

First Aspect:

For over two decades, libraries and information centers have successfully leveraged emerging technologies. They have implemented

automated systems to manage operations and holdings, incorporated electronic resources into their collections, and evolved into electronic and digital libraries. This evolution necessitated the development of new methods and tools for measuring and evaluating performance. Consequently, these electronic-environment metrics are integral to developing the means to assess performance and measure the quality of all aspects of libraries and information centers—ranging from collections, acquisition methods, and cataloging standards to the diverse services offered to users and the extent to which those users benefit from them.

The second aspect:

These measurements relied on a methodological approach unique to the field of Library and Information Science—specifically, the bibliometric method. This method involves the quantitative and statistical study of intellectual output based on statistical laws and equations; consequently, measurements of electronic justice have utilized the same laws employed in bibliometric studies and have established their own principles derived from bibliometric laws.

Therefore, we emphasize that these measurements of electronic justice fall within the scope of the Library and Information Science discipline.

Uses of Cyberspace Metrics:

While the uses and application areas of cyberspace metrics are numerous and diverse, we will focus here on web metrics, as these have been the primary area of emphasis within the field of library and information science.

The Web is defined as a network of documents—specifically, pages interconnected via hyperlinks—serving as a means to access information across the Internet. Consequently, the Web has become more closely associated with

the library and information discipline than the Internet itself; it represents an Internet-based model for information sharing, acts as the carrier for information resources within the Internet environment, and encompasses activities—such as organization, retrieval, and services—centered around these resources.

There are numerous programs designed to perform statistical web analysis and generate a wide range of statistics that reveal all aspects and components of the web. These programs are used to compare these components, as well as for evaluation and development planning; they are diverse and plentiful, with many being open-source.

Web Page Content Analysis

Web pages comprise text, images, audio, and video, serving as a medium for disseminating information on the Internet. Web page content refers to the material recorded on these pages—encompassing all ideas, topics, facts, data, and so forth, contained within them.

Nabil views content as water flowing through a network, stating that the "information society" is a duality consisting of an infrastructure—the telecommunications network—and the information content exchanged across it. He likens the telecommunications network to a system of blood vessels, while comparing the content component to water flowing through that network—considering factors such as volume, variability, flow rate, and universal accessibility. Ultimately, web pages serve as the vessel or medium that carries the published information.

Online, a webpage is a source of information that is identified and comprised of a uniform resource locator (URL). It consists of static text files that are stored, or dynamic files that are stored. These pages are written using specific

programming languages, the most well-known of which are HTML and XML. These languages enable navigation between pages. Analyzing the content of these pages means analyzing the textual and non-textual elements. For example, qualitative attributes of documents published on the web are analyzed, such as document size, number and types of domains, file types and protocols, file extensions, and the number of incoming hyperlinks.

2/ Web Link Structure Analysis

Analyzing link structures helps identify relationships between web documents—relationships that are valuable in the web environment. These links function similarly to bibliographic citations in traditional settings, helping to determine the value of documents and facilitating their evaluation within the context of information communication processes.

Web usage analysis refers to the examination of user behavior—including searching, browsing, and actual usage—and the extent of the benefit derived, based on user log files. It analyzes how users interact with the Web; for instance, it identifies the keywords users employ for specific topics and the amount of time they spend online. It also examines how that time is spent—whether on research, study, training, listening to music, watching movies, playing video games, chatting with others, etc.—as well as the topics that most attract users, and other related behaviors, interests, and potential trends among Web users. This field focuses on the human-Web relationship by studying the interactive behavior of users while they are online.

4/ tahlil tiqniaat alwib Web technology analysis

mustalah earid bitadamun 'ayi tiqniat barmajiat tustakhdam ealaa alwib mithl almutasafihat wamuharikat albahth wamin huna falieanasir al'asasiat litahlil tiqniaat alwib tashmal qias al'ada' fi almukawinat altiknulujiat alatiat :

- o binyat alwib yuqsid biha altahlil likuli albina' alfizyayiyi lilwib walati tashmal majmueat allughat alshaayieat alati tatakawan minha hadhih albunyat mithl lughat SGV alkhassat bialrusumi, watashmal 'aydan altahlil almajmueat almadadi alkhassat bialtahwil bayn lughat altarmiz walmaeayir alati tuamin eamaliaat altahwil

- o tarmiz alwib Web Mark up : wahi tashmal altahlil lilmadadi alati taqum ealayha lughat altarmiz lilwib mithl HTML w XML w SCML , kama tashmal altiqliaat alati tusaeid ealaa aibtikar tarmiz lughat jadida

4/ Web Technology Analysis

This is a broad term encompassing any software technology used on the Web, such as browsers and search engines. Consequently, the key elements of web technology analysis involve measuring the performance of the following technological components:

- o Web Architecture: This refers to the analysis of the Web's physical structure, including the common languages that comprise it—such as SVG for graphics—as well as the analysis of principles governing the conversion between markup languages and the standards that facilitate these conversion processes.

- o Web Markup: This involves analyzing the principles underpinning web markup languages (such as HTML, XML, and SGML) and the technologies that enable the creation of new markup languages.

Web Programming: This area covers the analysis of principles and programming applications for the web, including the software facilitating connections and interactions between devices—such as client and server machines—and the languages employed, such as Java.

- o Web Deployment: This involves analyzing technologies related to web applications, including standards for mobile web and security protocols for web systems.

- o Semantic Web: This analysis encompasses the artificial intelligence software underpinning the Semantic Web, as well as the various applications built upon that software.