

Internet Technologies as a Marketing Opportunity in Economic Institutions

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Received: 20/07/2024 Accepted: 16/10/2024 Published: 25/10/2024

INTRODUCTION

Defence Advanced Research Project Agency (DARPA) of the United States initiated a research activity that eventually developed a system for global data communication service known as the Internet. It operates as a joint effort of many organizations. In this unit, you will learn the basic concepts related to the Internet and the various mechanisms and technologies involved in Internet deployment. Upon completing this unit, the readers shall be aware of the basic terms and terminologies, involved devices and mechanisms, and the applications of the Internet.

The Internet has turned our existence upside down. It has revolutionized communications to the extent that it is now our preferred medium of everyday communication. In almost everything we do, we use the Internet, from ordering a pizza, buying a television, sharing a moment with a friend, or sending a picture over instant messaging. Before the Internet, if you wanted to keep up with the news, you had to walk down to the newsstand when it opened in the morning and buy a local edition reporting what had happened the previous day. However, today, a click or two is enough to read your local paper and any news source from anywhere in the world, updated up to the minute.

1. Internet space

1.1. The Definition of the Internet:

The Internet is the decisive technology of the Information Age, as the electrical engine was the vector of the technological transformation of the Industrial Age. This global network of computer networks, primarily based nowadays on wireless communication platforms, provides a ubiquitous capacity of multimodal, interactive communication in the chosen time, transcending space. The Internet is not a new technology: its ancestor, the Arpanet, was first deployed in 1969, but it was in the 1990s, when it was privatized and released from the control of the United States Department of Commerce that it diffused around the world at extraordinary speed. In 1996, the first survey of Internet users counted about 40 million, in 2013, they over 2.5 billion, with China accounting for the biggest number of Internet users. Furthermore, for some time, the spread of the Internet was limited by the difficulty of laying out land-based telecommunications infrastructure in emerging countries. This has changed with the explosion of wireless communication in the early twenty-first century. Indeed, in 1991, there were about 16 million subscribers of wireless devices in the world. In 2013, they were close to 7 billion (on a planet of 7.7 billion human beings). Counting on the family and village uses of mobile phones and taking into consideration the limited use of these devices among children under five years of age, we can say that humankind is now almost entirely connected, albeit with high levels of inequality in the bandwidth as well as in the efficiency and price of the service.

When it comes to the workplace, traditional methods of operation have become obsolete in almost all disciplines. The time for smart factories has arrived. The concept of automation has resulted in significant improvements in the design and manufacturing processes. Huge industries run on simple switches that operate automatically with truly little human participation. Fresh product types and equipment are introduced daily, proving the rapid pace of technological

breakthroughs. The Internet of Things (IoT) is one of today's most popular and fascinating modern technology applications.

The Internet of Things refers to anything connected to the Internet. If you connect your keychain to the Internet, for example, it becomes an IoT. If you misplace it, you can recover it by setting up a connection between the keychain and your phone using proper sensory elements. Therefore, concisely, a gadget collects data from its surroundings using sensors and actuators and delivers it to the Internet, where it may be processed. This group can include various devices—phones, computers, refrigerators, watches, TVs, washing machines, cars, and even homes.

The Internet started in the 1960s as a way for government researchers to share information. Computers in the '60s were large and immobile, and to benefit from data stored in any one computer, one had to either travel to the site of the computer or have magnetic computer tapes sent through the conventional postal system.

Another catalyst in the formation of the Internet was the heating up of the Cold War. The Soviet Union's launch of the Sputnik satellite spurred the U.S. Defence Department to consider ways information could still be disseminated even after a nuclear attack. This eventually led to the formation of the ARPANET (Advanced Research Projects Agency Network), the network that ultimately evolved into what we now know as the Internet. ARPANET was a great success, but membership was limited to specific academic and research organizations contracted with the Defence Department. In response to this, other networks were created to provide information sharing. January 1, 1983, is considered the official birthday of the Internet. Before this, the various computer networks did not have a standard way to communicate with each other. A new communications protocol was established called Transfer Control Protocol/Internet Protocol (TCP/IP). This allowed different kinds of computers on various networks to "talk" to each other. ARPANET and the Defence Data Network officially changed to the TCP/IP standard on January 1, 1983, hence the birth of the Internet. A universal language could connect all networks.

The World Wide Web—usually called the Web for short—is a collection of websites you can access using the net. A website contains related text, images, and other resources. Websites can resemble other forms of media—like newspaper articles or television programs—or they can be uniquely interactive with computers.

The purpose of a website can be almost anything: a news platform, an advertisement, an online library, a forum for sharing images, or an educational site like ours!

1.2. The origins and development of the Internet:

In 1961, Leonard Kleinrock published the packet-switching theory from his post at MIT. It was based on the idea that all the information leaving a device was chopped into blocks to facilitate its transmission. He called these block packets. The following year, Paul Baran presented a communications system that, through computers connected to a decentralized network, was immune to external attacks. Thus, if one node was destroyed, the rest could continue without problems.

Later, in 1965, it was possible to connect two computers, one in Massachusetts and the other in California through a telephone line, although it was not very operational. The big breakthrough came in 1969 with Michael Elie, who succeeded in connecting a computer at the University of California with one at the Stanford Research Institute. Soon after, four more universities joined, and this interconnection was called the Arpanet.

It happened in 1983. The United States Department of Defence decided to incorporate the TCP/IP protocol into its network, which was renamed Arpanet Internet, and eventually, the term Internet alone remained.

Years later, in 1989, Tim Berners Lee incorporated three new resources: HTML, HTTP, and a program called Web Browser. They were the basis for making web pages. A year later, the Internet was born in closed form within CERN, the European Centre for Nuclear Research based in Switzerland, and in 1991, it finally reached the public.

Sir Tim Berners-Lee, a British computer scientist, created the first website in 1991. The website was hosted on a NeXT computer at CERN (European Organization for Nuclear Research) in Switzerland. It was primarily used to share

information about the World Wide Web project. The website was simple, text-based, and provided information about the project, including its goals, the technologies used, and how to use them.

The first website's URL (Uniform Resource Locator) was <http://info.cern.ch/hypertext/WWW/TheProject.html>, and it can still be viewed on the Wayback Machine, an Internet archive that allows users to view old versions of websites.

This website was considered the first step in creating the World Wide Web. It was the first website that could be accessed via the Internet, and it demonstrated the potential of the web as a tool for sharing and distributing information.

Web 1.0 is the first publicly accessible version of the World Wide Web during the 1990s. It was a static, read-only web version, where users could primarily view and read the content without interacting or contributing significantly.

Screenshot of an early Netscape web browser window with Intel website content

A few key features characterized web 1.0:

- It was primarily text-based, with limited use of images, videos, and other multimedia content.
- Web pages were often simple and plain in design, with limited use of colours, graphics, and animations.
- Navigation was based mainly on hyperlinks, and web pages were often organized in a hierarchical structure.
- Web 1.0 was mainly used to share information and access specific data types, such as encyclopaedias and research papers.
- The concept of e-commerce did not exist yet. Thus, there were limited opportunities for online shopping or financial transactions.
- Website creation was mainly the domain of experts, such as web developers and programmers, and organizations or institutions created most of the content.
- The introduction of web browsers, such as Mosaic and, later, Netscape, made it easy for users to navigate and access information on the internet.
- The Internet has also paved the way for a host of services. Companies like Yahoo! and Infoseek provide portals to the Internet and have attracted considerable attention from Wall Street investors. Other companies, like Amazon.com and Barnes & Noble, have established online stores. Amazon had online sales of almost \$150 million for books in 1997. Electronic commerce; more broadly, is taking hold in many types of organizations, from PC manufacturers to retailers to travel agencies. Although estimates of the value of these services vary widely, they all reflect a growing sector of the economy that is wholly dependent on the Internet. Internet retailing could reach \$7 billion by 2000, and online travel services sales are expected to reach \$8 billion around the turn of the century. Forrester Research estimates businesses will buy and sell \$327 billion of goods over the Internet by 2002 (Blane, 1997).
- The Web has been likened to the world's biggest library—with the books piled in the middle of the floor. Search engines, which are programs that follow the Web's hypertext links and index the material they discover, have improved the organization somewhat but are difficult to use, frequently deluging the user with irrelevant information. Although developments in computing and networking over the last 40 years have realized some of the potential described by visionaries such as Licklider and Engelbart, the field continues to offer many opportunities for innovation.

1.3 The Importance of the Internet in Life:

Gone are the days when the pen was the most important tool; times have changed, and now the internet rules the world. The Internet offers a collection of important services and resources that are essential to daily living.

The Internet has opened a new world for many people around the world. Many opportunities are available here. It is a manifestation of never-ending innovation and creativity. It knows no boundary but brings huge economic chances for people in every country. The Internet allows people to improve the quality of their lives. It opens access to the previously inaccessible things. With almost Ten billion users, the internet has been emerging as one of the most important tools of communication.

Given the internet's increasingly significant role as a communication tool, the United Nations has even recently proposed that access to internet services should be a part of human rights. The Internet has influenced almost every aspect of

human life, not only private life but also public services. Right now, nobody can prevent other individuals from exposing their private lives to the public. More couples and families even post images or videos of their vacations in remote areas.

The Internet allows people more affordable and efficient access to basic amenities such as education, health care, public safety, and government services by:

- Affording people opportunities to participate in online learning and distance education
- Giving entrepreneurs and small- and home-based business owners opportunities to compete with large

corporations

- Increasing the productivity and efficiency of businesses that use the Internet for their operations
- Connecting patients in remote areas to healthcare services
- Making government services more readily available to residents
- Saving companies and organizations money by letting employees telework
- Allowing friends and families to stay in touch with one another
- It powers education and the economy. It supports our health and well-being and connects us to our neighbours

and to those we love. Americans without the Internet miss many of these benefits. Roughly, 1 in 5 American households are not connected to the Internet. That's a fifth of our country that is unable to fully participate in modern life.

➤ Access to the Internet is not a luxury. It is a necessity. That is why the Biden-Harris administration will provide \$65 billion to expand Internet access. We want to ensure that everyone in America can access reliable and affordable high-speed Internet. High-speed Internet does not just help individuals. It helps our country. It saves us time and money. It creates jobs and opportunities here in the United States. Moreover, it helps us connect, building a stronger, more free society.

➤ On the other side, the internet also allows the public to know what the government is doing. Now, even people on the street know what is happening among the political parties and government officials. It allows a company to check what the competitors are doing and going to launch and enables the public to criticize what the producers offer. In other words, the internet provides open access – almost without limit.

2-Internet properties:

It is the wider network that allows computer networks across the globe run by companies, governments, universities, and other organizations to talk to one another. Therefore, we can say that the Internet is a global system of interconnected computers that uses standardized Internet Protocol for communication and sharing information.

2-1 general features

- It offers information 24 hours a day and it can be accessed as long as there is a connection.
- It is public by nature.
- It does not belong to any entity, and it is universal and decentralized, so there are no control points at the hierarchical level.
 - It is collaborative, meaning everyone can share information on the Internet.
 - Its growth is unlimited and collaborative, allowing new connections to the network in a shared way.
 - It creates a trace-based on each user's interaction, so personalized experiences tailored to their interests and preferences can be offered. However, it is an anonymous network that does not require users to identify themselves to use it.
- It can be accessed from any device immediately, and messages are transmitted instantly.
- Its uses can range from searching for information to research, social contacts, direct communication, education, and financial operations.

2-2-Special properties

Some additional points can be touched upon about the characteristics of the Internet:

- **ComplexNetwork:** The internet interconnects over 150 million computers, forming a complex "web of computers."
- **Disorganized:** Due to its dynamic nature, the internet is a complex network, making it confusing even for experienced users to navigate.
- **Extensive Usage:** Millions of individuals access the Internet regularly for various purposes.
- **Collection of Billions of Files:** The internet hosts vast amounts of information on every possible topic, stored in various file formats.
- **Exponential Growth:** The internet experiences exponential growth, doubling its size approximately every 18 months.
- **Dynamic:** Information is constantly shared on the internet, making it dynamic and ever changing. For example, a new network connects to the internet approximately every 30 minutes.
- **Worldwide Scope:** The internet is utilized by millions of people globally for activities such as file sharing, topic searching, emailing, etc.

In addition to some points of characteristics related to the Internet:

➤ **Interactivity:**

The interactive character of the Internet utterly changes the libel playing field. It is completely different from the Industrial Age paradigm where newspapers and television stations had dominant if not monopolistic relationships with readers and viewers.

➤ **Shifting the Balance of Power in the Offline World:**

In some situations, the Internet can change the balance of power that exists normally in the offline world. Any enterprise that has been the target of a concerted cyber-attack realizes that the terms of the debate are not what it is accustomed to, where, for example, it can gain favourable attention for its press releases. On the contrary, the attackers are the persons with the power. The ferocity, ubiquity, and tenacity of cyber libel attacks often stun their targets. The power of the Internet to cause instantaneous and irreparable damage was graphically described by the Ontario Court of Appeal in *Barrick Gold Corp.*

➤ **Anonymity:**

Internet users do not have to reveal their identity to email or post messages on bulletin boards. Users can communicate and make such postings anonymously or under assumed names. This feature, fused with the ability to access the Internet in the privacy of one's home or office and the interactive, responsive nature of communications on the Internet, has resulted in users being far less inhibited about the contents of their messages. This feature has spawned a body of law in Australia, Canada, the UK, and the US that discusses when plaintiffs are entitled to the names and addresses of anonymous defendants.

➤ **Re-publication:**

The Internet allows statements to be easily re-published on numerous occasions to an unlimited audience. The ease of re-publication raises questions of when the original publisher is liable for re-publication, when the original publisher can avoid a limit liability for re-publication, and when a subsequent person is liable for re-publication of a statement that did not originate from them.

➤ **Intermediaries:**

". . . Intermediaries are involved in every Internet publication."

➤ **Long-Term Impact — Permanent Archives**

Another distinctive feature of the Internet is that information can be stored in perpetuity, yet made accessible as though the events are contemporary through a few clicks of the mouse. Instead of the concept of "skeletons in the closet," the skeletons are now "on the doorstep." The danger of libel lurking in the background to emerge in the future has been an important factor in damage awards in libel actions that have been discussed.

3-The role of the Internet in business development:

The internet is so entwined into our lives that it is hard to believe it has not always been this way. Today, many types of business communication are performed in a completely different way than before the internet — everything from frictionless employee collaboration to an ever-growing array of communication channels to the ability to instantly connect with customers around the globe. The change is so all encompassing that it is almost impossible for those born into the post-internet world to grasp life in pre-internet days fully — and more advances are on the way.

"Information technology and business are inextricably intertwined. I do not think anyone can talk meaningfully about one without talking about the other. Bill Gates." Companies that have already expanded their sophisticated internet network to their structures and developed specific content vital to their business needs are not said to have reached the peak of their business success. Nowadays the internet is the key technology that enables businesses -especially, small and medium enterprises (these enterprises in English are known by the abbreviation SMEs from the words Small and Medium-size Enterprises), to adopt it internationally to improve their performance². In this regard and all other respects, the Internet is a living system becoming bigger, better, and more insecure with each contribution of private individuals and or various organizations. This latest argument highlights the need for companies to consider more than just the adoption of modern technology, but also aspects that have a direct impact on the vital processes of their business.

The Internet has revolutionized the way companies do business. With its help, the global marketplace is more accessible, connected, inclusive, and diverse. The Internet provides many benefits for business development, communication, and collaboration.

In pre-internet days, a business would open a storefront, put ads in the local paper, join a local networking organization, and hope local customers needed what they had to offer, all that changed with the inception of the internet. A business no longer depends on its regional customer base for its survival; it now has a worldwide audience for its goods and services. The internet has changed not only a business's customer base but also how it communicates with its employees and finds and manages its competition.

The Internet as a sophisticated structure, the basis of information flow within and outside companies has a two-way impact on businesses: 1) it increases the dependence between companies and the Internet itself, and 2) it increases the interconnection between businesses. In other words, the more companies develop and disseminate information technology in their business and use this structure for it, the better you communicate with your partners and the more their dependence on the Internet increases on the one hand and partners on the other. Ignoring other issues, here I will focus on only one important problem of interconnection between the Internet and Internet companies and companies, which is security. Security is the most obvious risk for companies operating online. The business and information that make up the business base of these companies are secured but open to the whole world, which has any internet access. We are witnesses in the case of the company SONY and many others where it has reached the sensitive information of the company without its permission by third parties with only a few can. This is an example of internet security problems, which in many discussions raises the question of whether the virtual world is again moving towards a "dot com bubble". For this, Business Roundtable (2007), the association of chief executive officers (CEOs) of US companies estimates that companies should assess their dependence on the Internet from the perspective of their business to ensure that they are in be able to have life-saving operations in place as soon as possible after a major internet disruption", as this action is critical to minimizing potential hostile attacks, as well as to minimizing the negative impact on the economy and overall security. Of the country, Business Roundtable (2007) concludes, "business cannot treat significant Internet disruptions wisely.

With the internet, small business owners have been able to manage their business from anywhere. For example, an owner on a business trip can stay in real-time contact with their office through a live chat, messaging apps, or a video meeting, sharing important documents with anyone from anywhere in the world.

Let us take a closer look at how the Internet has changed business.

Ability to communicate. A business's ability to communicate with its employees, customers, vendors, and associates changed dramatically when the Internet yielded new communication tools. Emails, instant messaging—, and now messaging apps like WhatsApp and Messenger — have changed the face of business communications.

3-1-Uses of the Internet in business organizations

➤ **Remote and hybrid work.** Driven largely by COVID-19, many businesses are now offering the option for their employees to work from home online, often using office equipment provided by the company, either full-time or part of the week. This process allows a business to cut its overhead costs by needing less office space and using fewer utilities for daily operations.

➤ **Marketing to a wider area.** With the advent of Internet marketing, businesses have had to stay abreast of the needs of their customers. Competition is no longer localized; Businesses now have competition worldwide. It is imperative that a business knows what its customers want and delivers it. Surveys, questionnaires, feedback forms, and comments on a website can be used to monitor a business' customers' needs.

➤ **Online marketing has transformed the business world.** It has created new opportunities for businesses of all sizes to reach a global audience. Moreover, it enabled companies to target their advertising more precisely than ever before. The result is that businesses can generate more leads and sales with less effort and expense.

Wenowsee businesses hire responsive web development services to build and maintain interactive websites. However, online marketing is not just about creating a website and putting up some banner ads. To be successful, businesses need to have a comprehensive online marketing strategy that includes search engine optimization (SEO), social media marketing, email marketing, and content marketing.

By using all these channels, businesses can create a well-rounded marketing campaign that reaches their target audience wherever they may be. Online marketing is no longer an option; it is a necessity. Ignoring it is not an option if you want your business to succeed.

➤ **Using digital advertising.** Including digital in a business' advertising budget has extended the ability to attract customers from anywhere — in the company's backyard or all four corners of the globe. Websites, online demand generation tactics like pay-per-click advertising, display ads, content syndication, search engine optimization (SEO), and more have allowed businesses to build a presence on the web and reach millions of potential customers.

➤ **Collaborating with other businesses.** The Internet has simplified working with other enterprises and professionals. Internet-based events like webinars make sharing knowledge or collaborating on projects with people globally as easy as logging onto a website.

➤ **Increased Connectivity.** In recent years, the business world has undergone a dramatic transformation. Thanks to increased connectivity, businesses can now operate on a global scale. With the click of a mouse, companies can instantly communicate with customers and suppliers worldwide. This increased connectivity has had a profound impact on the way businesses operate.

In the past, companies were limited by geography. Today, businesses can quickly expand their reach to new markets. This has made it easier for small businesses to compete with larger firms. In addition, increased connectivity has led to a more complex business landscape.

With so many companies operating globally, the talent competition is fierce. As a result, businesses must work harder than ever to attract and retain top talent. Increased connectivity has also led to other changes in the business world.

For example, there is now a greater emphasis on collaboration and teamwork. Companies are also increasingly relying on technology to improve efficiency and optimize operations. Overall, it is evident that increased connectivity has significantly affected the business world.

➤ **More Data Available.** The business world has changed drastically in recent years, thanks to the vast amount of data that is now available. With powerful tools like big data and data analytics, businesses could gain previously unattainable insights. As a result, they have made more informed decisions, optimized their operations, and better served their customers.

Data has also levelled the playing field for many businesses. In the past, large corporations had a significant advantage over smaller firms regarding accessing information.

Now, thanks to the internet and social media, smaller businesses have just as much data as their larger counterparts. This has allowed them to compete more effectively and carve out a niche in the market.

Data will continue to play an essential role in the business world, and those who can harness its power will be well positioned for success.

➤ **Increased Competition.** Business is no longer what it used to be. In the past, companies could operate without the worry of much competition. They knew their target market and stuck to selling their product or service. Now, things are different.

The advent of the internet and social media has made it easy for customers to find alternatives to what you are offering. If they don't like what you're offering, they can quickly and easily share that with their friends and followers.

As a result, businesses have had to adapt their strategies to remain competitive. They can no longer rely on selling a single product or service; they must now offer a comprehensive solution that meets the needs of their customers. In addition, businesses must be able to adapt to changes in the market to remain relevant quickly.

The days of doing business the same way year after year are gone; now, companies must be agile and ready to change immediately. The business world has changed dramatically in recent years, and those who have not changed have been left behind.

Overall, the Internet has had a significant impact on the business world. It has changed the way we communicate, collaborate, and compete. If you want to succeed in business, you need to ensure you are keeping up with the latest trends.

➤ **Customer Engagement and Support:** The internet has transformed customer engagement and support, creating new avenues for interaction. Social media platforms and online communities provide spaces where customers can connect with businesses, ask questions, provide feedback, and share their experiences. This direct engagement enhances customer satisfaction, fosters loyalty, and enables companies to address issues promptly. Additionally, businesses can leverage customer data to offer personalized recommendations and tailored experiences.

In conclusion, the Internet has influenced business and commerce profoundly. It has shattered geographical boundaries, enabled global reach, and created new business models. The rise of e-commerce, digital marketing, and direct-to-con.

3-2. Advantages of using the Internet for business

Beyond easier collaboration, work flexibility, and other benefits discussed earlier, the Internet has offered several other business advantages:

➤ **Speed.** High-speed Internet, and the increased capacity that comes with it, added several capabilities for businesses. For example, a real estate agent can load and deliver virtual tours. An artist can load large graphic files, and larger media files can be transmitted between users. A sales rep can create digital presentations and deliver them online.

The high-speed internet model started with DSL — digital subscriber lines for high-speed access over a phone line — and then speeds increased again with fibre-optic lines.

➤ **Mobile internet access.** Thanks to the internet, business users can reach potential customers via the mobile devices they have on hand nearly 24/7. Businesses can access their audiences, make their brick-and-mortar locations easy to find, if needed, and garner positive reviews through a high level of performance.

➤ **Access to information.** The internet made just about every fact and piece of information that a business could need immediately available. Are you forming an LLC, a corporation, or a new business? Search and you will find the information, paperwork, and services you need. You can even find services that will file the paperwork on your behalf.

➤ **Business automation.** A major internet-driven trend in the business world, automating tasks that traditionally require a workforce ultimately saves money and makes operations simpler and more efficient. Everything from basic accounting practices to customer service offers automation possibilities depending on the business model and requirements.

➤ **Web-based applications.** The Internet has facilitated the development of concepts like cloud computing, cloud call centres, software as a service (SaaS), and more that have enabled the processing and storing of data in large proportions; the result is reduced infrastructure costs for companies.

4- Types of online communication:

➤ **Internet communication enables you to communicate with people over the web.** The communication process occurs in any form, such as messages, voice, and video calls. The biggest reason people are shifting towards this technology for communication is cost savings.

You will find several applications over the web that allow app-to-app, click-to-call, and app-to-phone call services without imposing any calling charge for web interaction facility.

➤ **WhatsApp, Skype, Google Meet, and Messenger** are some of the most popular applications that facilitate users' access to communication services.

Internet communication services not only benefit users but also help businesses to communicate with overseas customers at the most cost-efficient price. Corporations have agreed that they depend on the Internet for smoother functioning of their services.

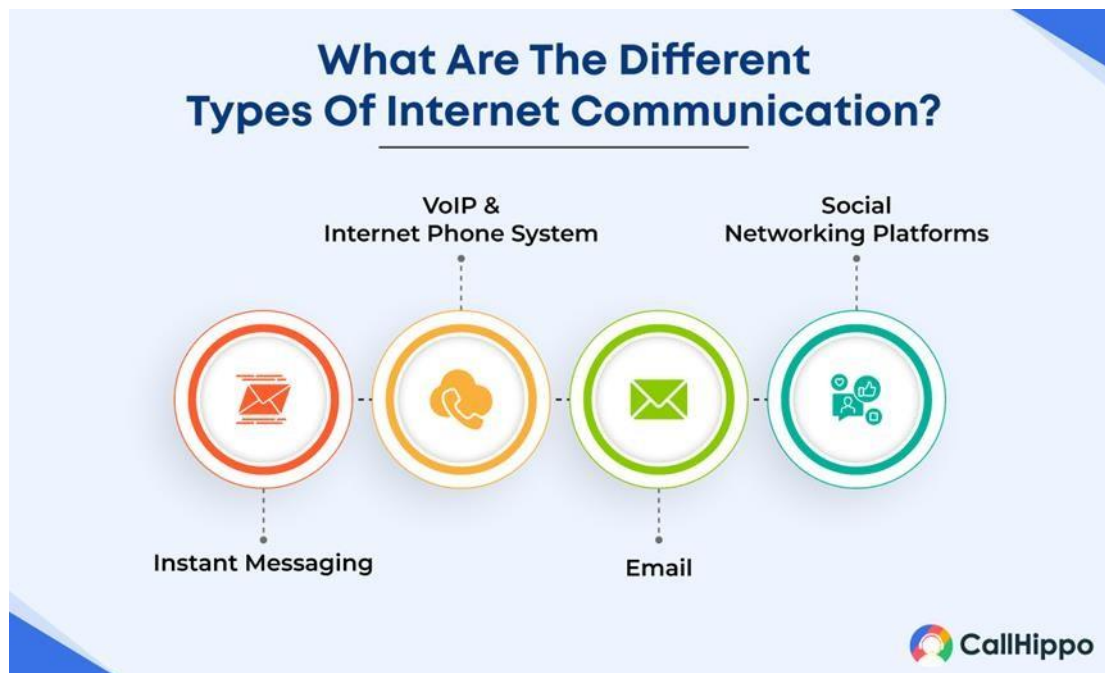
The Internet has a vast number of options for seamless two-way communication. Let us check some prominent worldwide modes for quick and hassle-free electronic mail communication.

The Internet offers many advanced options that allow users to have seamless two-way communication. Using the internet in communication enables users to connect and interact with others without difficulties.

It has become a significant mode of connectivity nowadays that benefits users and businesses in many ways.

Let us find out some of the most influential and prominent modes for establishing quick and hassle-free communication over the web.

represents the types of communication over the Internet.



Source: <https://callhippo.com/>

4-1 Instant Messaging

Instant messaging is a highly used online chat technology that allows users to communicate with others in real-time via an internet-based chat room.

These systems are specially designed communication tools that enable users to have an uninterrupted communication facility when a user logs into a dedicated instant messaging system. Once he starts his login session, he notifies other users about his presence. Instant messaging tools allow users to chat with each other synchronously.

The best thing about these communication tools is that they not only save time but also allow users to have communication facilities without paying a single penny. All they have to pay for internet connection charges, and they will be able to communicate with others.

Instant messaging is quite beneficial in several aspects. With the help of these messaging tools, employees can connect with their managers and colleagues to establish communication remotely.

The messaging tool eliminates the need to place a call to access information and helps you to have a much easier communication interface for instant information sharing.

Yahoo Messenger, Google Messenger, MSN, and Messenger are a few popular instant messaging tools that help users communicate irrespective of their geographical locations.

It can also be said that instant Messaging (IM) is an online chat technology that allows people to communicate via messages in real time within an internet-based chat room.

When users log into an IM system, their friends are notified of their presence, and they can talk to each other synchronously. In addition, various types of online team chat apps are available in the market.

A timesaving tool, instant messaging allows employees to instantly reach their managers and colleagues working remotely or in other branches. It eliminates the need to place calls immediately when you require some information and simplifies life.

Some popular IM services are AOL Instant Messenger, Yahoo Messenger, and MSN Messenger. Although the features of these service providers are similar, they have their benefits and drawbacks.

4-2. VoIP and Internet Phone System

Internet telephony uses the Internet to route telephone calls instead of traditional phone lines. For example, voice over Internet Protocol (VoIP) sends voice packets using IP instead of PSTN (Public Switched Telephone Network).

Internet telephone services utilize the Internet as a bridge that helps them to route telephonic calls to designated numbers instead of traditional phone lines.

The working functionality of voice over internet protocol (VoIP) is easily understandable, and it sends voice packets using IP instead of PSTN (public switch telephone network). Once the voice packets reach the pre-decided destinations, it again is converted into voice data for the receivers.

Users and businesses making calls worldwide can benefit immensely from an Internet phone system. They are cost-effective and allow you to make calls from anywhere. Other benefits of Internet telephony include:

- *Is highly cost-efficient

- *Helps offer better customer service

- *Offers comprehensive features

- *Is highly scalable

Cloud telephony solutions are quite beneficial for businesses, and these systems help them function properly and contribute to their growth. A virtual phone number is an internet phone system that has become an integral part of businesses for smooth functioning.

4-3 Email

As per a recent survey, you will be amazed that active email users will touch 4.3 billion by 2023. It is one of the most effective modes of communication and an advanced way of exchanging media files. Users can have the benefits of these communication facilities without paying any charges.

Email is considered one of the most reliable and secure communication channels today. Therefore, businesses prefer to communicate to email.

Email or electronic technology is a way of exchanging messages and files. Email communication is quick and reliable. You can send emails any time of the day or year; it is free of cost! This is one of the reasons why email marketing is buzzing in the business world today.

You can create emails through software like Microsoft Outlook or Gmail and send them to another person, given that you have the recipient's email address.

Unlike Instant Messaging, professionals mostly use email to communicate with each other. For example, 62.86% of business professionals prefer email while communicating for official purposes.

Most emails contain a subject line, giving the recipient a glimpse of what they can expect in the email.

The biggest advantage of emails is that they allow you to go paperless. Even the documents can be digitized and emailed to multiple people simultaneously instead of printing and distributing the papers.

4-4 Social Networking Platforms

Social media is an integral part of our lives and is considered one of the most popular internet communication methods today. You all will be aware of social media platforms like Facebook, Instagram, Twitter, and WhatsApp. These channels have gained immense popularity among every age group and are considered the most popular Internet communication methods. While Facebook was and still is the most widely used social channel, numerous platforms now make internet-based communication easier than ever.

For example, Twitter makes it easier for customers to talk with brands and public figures. Similarly, TikTok helps to connect with GenZ. Post engaging videos and get some TikTok views to get the content trending. WhatsApp enables users to talk to each other for free via messaging, audio, and video.

Here are some major benefits of using social media for communication through the internet.

- Faster and easier communication with friends and customers.
- Businesses can enhance their brand awareness.
- A great way to redirect traffic to your landing page and website.
- Social media platforms help businesses interact with customers and provide real-time feedback to increase customer loyalty and lifetime value.
- Social media portals help in advertising, promotions, and market research.

5- Advantages and Disadvantages of Internet

The Internet is a wide network of computers that enables users to access information from anywhere. It is a global service that is available to everyone and is easy to use as well. While it seems beneficial in all aspects, there are several advantages and disadvantages of the internet.

The Internet is the most popular and innovative creation within the world of technology is the Internet. The web is where all types of data are present and even the communication process is feasible using the web. The planet has now become internet-dependent due to its vast advantages. There may be a check both its advantages and drawbacks.

The Cambridge Dictionary defines the web as an outsized system of connected computers worldwide that permits people to share information and communicate with one another. The web is run and governed by various companies, businesses, governments, and academic institutions for his or her purpose. It carries data about almost every subject and has quickly become an important part of everyone's lives. Over 4.5 billion people everywhere on the planet are internet users currently. Now let us look at the advantages and the disadvantages of the Internet

5-1 Advantages of Internet:

The Internet is a global network system that has dramatically transformed trade and communication. The network of networks, the Internet connects computer systems across the globe, enabling them (and thus, their users) to interact efficiently. Although its popularity rose gradually, about half of the world's population is now an Internet user, utilizing the Internet in everyday life.

The internet is perhaps one of the best inventions thus far. As anyone can access the computer this made people by stripping away geographical barriers and sharing information instantaneously.

The speed of communication becomes faster which is obtained through the web. Families and friends can use the internet easily. The platform for products like SKYPE, ZOOM, Teams, etc. allows for holding a video conference with anyone in the world who also has access. It helps in connecting two people present anywhere very easily.

However, even those who still prefer traditional methods like phone calls or letters in the post will have to deal with a business by email or live chat at some point.

The internet revolutionized methods of communication, including those that were once only science fiction, like video calling and conferencing.

One of the biggest advantages of the Internet is communication. Through this network of networks, you can communicate with anyone remotely. Wireless systems or physical presence is unnecessary to communicate with people. Within seconds, you can connect with someone sitting thousands of miles away. This ensures that you do not lose touch due to increased distance.

The growth of social media platforms like Instagram, Facebook, WhatsApp, Twitter, and other communication forums has paved the way for creating a global social network where anyone may reach out to resolve their concerns and remain connected to family groups and friends. Spending time with people they love no longer depends on their physical proximity.

- **Abundant Information:** Anyone can find information on almost any imaginable subject. Plenty of resources are often found through the program in minutes. The Internet helps in providing information on all topics.

The growth of social media platforms like Instagram, Facebook, WhatsApp, Twitter, and other communication forums has paved the way for creating a global social network where anyone may reach out to resolve their concerns and remain connected to family groups and friends. Spending time with people they love no longer depends on their physical proximity.

The Internet is full of essential information, be it on financial matters, government legislation and service, market information and economic affairs, technological information, educational and academic issues, and new ideas. It includes many topics, from scientific publications to topics geared toward children.

- **Inexhaustible Education:** For instance, students can gain readily available help for their homework online. Not only homework but there are also so many platforms that provide online education that helps students to gain expertise in various domains. It helps in expanding the learner's knowledge.

Have you ever considered studying at prestigious universities such as MIT, Harvard, Stanford, Cambridge, IIT, NIT, MIT (Madras Institute of Technology), IISc, or IIM but were unable to pursue the opportunity? Our best buddy "The Internet" has enabled these prestigious universities to provide lecture lessons to other college students via YouTube (e.g. MIT courseware, CS50, etc.), and NPTEL.

In today's competitive world, relying solely on traditional education may leave you lacking the critical abilities to compete with your peers. The Internet has enabled us to acquire new skills through online courses from industry professionals, as well as gather a wealth of knowledge about various technologies, current events, sports, art, and culture. The greatest way to illustrate the internet's benefit is to imagine that you are reading about the internet via the internet.

- **Entertainment for Everybody:** Most folks love using our laptops, smartphones, and, tablets. The web is the big reason behind us spending such a lot of time on these gadgets. With the ease of the Internet, the entertainment industry has also scaled and it helps it expand in many ways like OTT platforms and many other platforms, etc.
- **Online Services and E-commerce:** Many email services, online banking, online shopping, etc. are there. Free mail to anyone is accessible all around the world. E-commerce enables one in America to shop for things in Asia, Africa, or other places through simple clicks of the mouse.

With the help of the internet, we can browse the whole inventory of any online store from the comfort of our homes and reap the benefits of online shopping. Additionally, small businesses and individuals use the Internet to expand their reach into the worldwide market. Artists, craftspeople, and others living in remote places can now sell their art in the global market via the Internet. Not only has the internet proved to be a boon for online shoppers, but you can also access online

services. Online booking is available for most essential services, because of which activities like booking a cab, ordering meals, or contacting a mechanic have gotten significantly easier.

- **Social Network:** Social networking is the sharing of data with people across the planet. Aside from being an entertainment website, it has many uses. The Internet has given a massive gain in these social networking sites as it connects people far away in just a few seconds.
- **Learning:** The web has now become a neighbourhood of education. Education like home schooling is administered using the web. Teachers can upload their teaching videos on the web and nowadays many more platforms have come to teach students because of the accessibility of the Internet.
- **Internet Banking:** Internet Banking is one of the main advantages of the Internet as it helps people nowadays to use banks in a digital way, which helps in people not going to banks, not standing in queues in banks, etc. People can use banking services at their fingertips with the help of the Internet.

5-2. Disadvantages of Internet:

The Internet's drawbacks cannot be overlooked any longer as Internet Addiction Disorder affects numerous teenagers, and many women have become online shopaholics.

The Internet has proven to be an extraordinary invention that has changed our lives completely over decades. However, this technology does have the following drawbacks:

✓ **Loss of Personal Information**

When using social networking websites or online banking services, consumers enter their personal information including email addresses, bank account numbers, credit card details, and phone numbers. A software expert or a hacker, can easily access this information, resulting in privacy exposure or even identity theft. Viruses are designed by hackers to infiltrate computer systems and wreak havoc, further leading to privacy concerns. Online frauds have become increasingly common in recent years, and it is imperative to check what we share on the World Wide Web.

Cybercriminals steal personal information and credentials to commit fraud. For identity theft, criminals access your information in an unauthorized and illegal manner. Once they steal your PII, they misuse it to commit crimes to obtain goods and services. In the worst-case scenario, they may even try to ruin your reputation.

✓ **Internet Addiction**

This is one of the biggest disadvantages of the Internet. Over time, people have become addicted to using the internet. This is evident in teenagers who spend more time playing games or using social media on the internet. They value online lives more than the real life. This makes virtual reality more addictive. Due to this, many become aggressive or even clinically depressed when they do not have internet availability.

No doubt, the internet has made people its slave, reducing offline social abilities. This has led to an adverse impact on people's mental health. Elders and children alike have been impacted. Mobile phone apps like YouTube allow children as young as two to see online videos. They are spending more time in front of a computer screen, which has stifled their cerebral development.

✓ **Shortened attention span:**

Due to the availability of excessive means of entertainment over the internet, the attention span of the average human brain has become less. People nowadays have an attention span of less than a minute, requiring changes within minutes.

✓ **Time Wastage**

On the Internet, it is easy to lose track of time. Surfing might take longer than you think, and you may not even know it. This also leads to increased screen time, which harms our memory, especially in children. We are not using our brains as much as we used to because of the rise of the Internet. When we were younger, we used to remember phone numbers,

addresses, and PINs in our heads, as well as perform simple math without the aid of our phones. However, we increasingly rely on the Internet for everything.

The Internet is one of the ways that can lead to the waste of your time. It happens to almost all of us nowadays, as we start surfing and we continuously start surfing and do not realize how much time we wasted. This results in increasing screen time, and this leads to loss of memory power.

✓ **Spam:**

Unnecessary emails, advertisements, etc. are sometimes said to be spam because they need the power to hamper the system and make the users face many problems. Heavy use of the Internet leads to so many issues like bank account fraud, internet fraud, etc.

✓ **Cyber Crime:**

Hacker programs can lead Cyber Crime. A virus that gets into the PC and ruins valuable data. Culprits when used on the web, often access users' personal information like name, address, master card, bank details, and other information, leading to significant economic loss.

One of the biggest disadvantages of the internet is the risk of cyber breaches. Websites, applications, emails, and software, everything on the internet is prone to breaches. Cyber attackers can find a loophole in the system and breach it to extract the information. Due to this reason, information over the internet is vulnerable to theft.

✓ **Obesity and Other Health Issues**

➤ Excessive consumption of the internet promotes a sedentary lifestyle, which in turn can lead to weight gain. Being constantly on the Internet, playing games, using streaming services, or social networking can lead to an unhealthy physique like poor eyesight, excessive weight gain, etc. In certain cases, the constant use of the internet and its misuse also increased mental health issues in teenagers and young adults.

➤ Playing games and spending too much time on monitors leads to obesity and an unhealthy lifestyle. It also affects the eyesight of the person using the device for a long time. It has serious health issues.

➤ **Fake News**

➤ The spread of fake news is one of the biggest disadvantages of the internet. Since there are limited to no controls on a communication forum, website, or social media platform, fake news often goes viral - risking the well-being of entire communities.

6-Internet Domains

Machines on the internet are uniquely identified using their corresponding IP addresses.

Similarly, the names assigned to the computers must be unique to avoid ambiguity. A Name space refers to the mapping between the names of the machines and their corresponding IP address. Namespaces can be organized in two ways:

Flat Name Space: This indicates the direct mapping of the IP address to the complete name of the machine. Names are simply a series of characters having no specific structure.

Hierarchical Name Space: In this namespace, every name consists of several parts. The first component may refer to the nature of the organization, the second may indicate the organization name, and the third may denote the department in the organization, and henceforth.

Hierarchical namespace requires domain namespace, which is an inverted tree structure with each level corresponding to a component of the namespace. The complete tree shall have only 128 levels, where level zero refers to the root. Figure 3 shows the structure of DNS

A domain refers to a subtree of the domain namespace, as shown in Figure 4 the domain name of the root of the subtree will be the domain name. A domain can be further subdivided into subdomains

In the context of the Internet, the domain namespace (tree) can be classified as:

- Generic domains
- Country domains
- Inverse domains

6-1 Generic Domains: Generic domains identify the registered hosts as per their general capabilities. Each node of such a tree refers to a domain that serves as the index for the domain namespace database. Figure 5 shows the structure of Generic Domains.

6-2 Country Domains: Country Domains employ abbreviations of the country. The abbreviations are limited to two characters, e.g. In for India. Further labels may refer to the specific organization or other national designations. Consider the following country domain `anza.cup.ca.us`. This refers to De Anza College in Cupertino, California, United States.

6-3 Inverse Domains: The inverse domain maps the IP address of the machine to its corresponding name. Consider, a client requesting some resources from a server. The server may have a list of authenticated clients. However, the request received from the client has only the IP address of the client. In such cases, it is required to resolve the IP address to the client name so that the server can verify it with the list of authenticated clients it has.

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