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REPORT

Research on IT Sector

HISTORY OF IT SECTOR WITH A BUSINESS IDEA IN THE FIELD

Prepared for

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Prepared by

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LETTER OF TRANSMITTAL

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Salmaan Rahman
Professor
FAST NUCES, Lahore

Dear Mr. Salmaan Rahman,

Within the attached is the history of IT sector and a business idea to expand the field. This was an individual project so solely I prepared this report.

My analysis includes researching history of information technology sector in detail. The report mainly focuses on the evolution of computer industry, popular trends along with the future of IT sector .Based on my research, I concluded the IT sector is a beneficial space for business and there are many new horizons we can explore. I have provided an outline for a business idea in the attached report for your review.

Thank you for trusting me to complete research for you

If you have any questions regarding the attached report, please contact me at any time
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Sincerely,

Hafsah Zulqarnain

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EXECUTIVE SUMMARY

This analytical report includes a thorough history of the IT industry as well as details on the businesses that have had a significant impact on it. Additionally, it covers market trends at the moment as well as how the future of the IT industry will develop. A portion is also devoted to discussing the main categories of industries from which the software sector was selected and thoroughly investigated. In the final section, an M-commerce business idea is suggested while taking into account all the relevant information regarding online marketplaces.

The statistics are primarily about how internet businesses are developing and performing incredibly well in the IT industry. The recommended business venture caters to a niche market and has the potential to be very successful. The basic concept is on an online vintage store that offers reasonably priced, everyday items of a bygone era.

Nostalgia will be utilized as a marketing strategy to promote and market well-preserved goods. After examining the dynamics of the IT industry and analyzing the early successes and profits that various e-businesses generated, we recommend launching an internet store catering to the dynamic market of vintage collectors and dealers. There is potential for this business to become valuable.

INTRODUCTION

Introduction to the Study

The IT sector is one of the most important and fastest growing industries in the world. The industry has seen tremendous growth in recent years and is expected to continue to grow at a rapid pace. The IT sector is highly competitive and dynamic, with new technologies and business models emerging constantly. This report will provide an overview of the IT sector, with a focus on the opportunities for businesses to enter the market.

Statement of the Problem

The goal of this paper is to examine the past, present, and future of the IT industry and to develop a suggestion for how to broaden the field.

Significance of the Study

The history of the IT sector is full of amazing achievements and innovations that have made our lives easier and more connected. It is a sector that continues to grow and evolve at a rapid pace, making it an exciting place to do business. Coming up with a new business idea in this ever-changing landscape can be daunting, but it is also immensely rewarding. By understanding the significance of the IT sector's history, you can develop a keen eye for spotting new opportunities and trends. This report will give you an overview of the major milestones in the history of IT as well as a business idea to add to these ever expanding field.

FINDINGS

The findings will be presented in five sections .History, industries within the sector, influential companies, and trends in technology and future projections. On the basis of these findings a field of interest will be selected and then discussed thoroughly.

Technology:

The term '**technology**' is used in a variety of ways. In general, it can be used to describe the application of scientific knowledge for practical purposes, especially in industry. Technology includes the use of materials, tools, techniques and systems to *solve problems* or create new *products*.

Types:

There are a number of different types of technology that are discussed below

• Agricultural technology – the application of scientific and engineering principles to the problems of agriculture, including the development of new machinery, fertilisers and pesticides.
• Biotechnology – the use of living organisms or their products to make useful products or processes.
• Chemical technology – the application of chemical principles to the development of new products and processes.
• Communication technology – the use of technology to transmit information, including telephony, television and the Internet.
• Construction technology – the application of technology to the construction of buildings and other structures.
• Educational technology – the use of technology to improve the process of teaching and learning.
• Energy technology – the application of technology to the generation, distribution and use of energy, including renewable energy sources.
• Environmental technology – the application of technology to the problems of pollution and the environment.
• Food technology – the application of technology to the production, processing and packaging of food.
• Information technology – the use of technology to store, retrieve and transmit information, including computers and the Internet.
• Medical technology – the use of technology to diagnose, treat and prevent diseases
• Nanotechnology – the use of very small particles to create new materials and devices.
• Nuclear technology – the use of nuclear reactions to generate energy and create new materials.
• Transportation technology – the use of technology to develop new methods of transportation, including cars, trains, aircraft and spacecraft.

History of Technology:

The *history of technology* is the history of the invention of tools and techniques and is one of the oldest branches of *engineering*. This history is marked by a number of important milestones, such as the first use of *fire* and the first use of *tools.*

First Uses:

- ***fire*** is thought to have occurred about 1.7 million years ago
- ***tools*** is thought to have occurred about 2.6 million years ago
- ***stone tools*** is thought to have occurred about 2.4 million years ago
- ***pottery*** is thought to have occurred about 9,000 years ago
- ***metals*** is thought to have occurred about 11,000 years ago
- ***writing*** is thought to have occurred about 5,000 years ago
- ***wheel*** is thought to have occurred about 4,500 years ago
- ***steam engine*** is thought to have occurred about 2,000 years ago
- ***electricity*** is thought to have occurred about 1,000 years ago

The IT sector is one of the most fascinating and rapidly growing industries today. The developments in this field have improved our lives in a way never imagined before. From communication and collaboration tools to artificial intelligence and machine learning, the IT sector is constantly innovating and evolving. This industry provides endless opportunities for those with a passion for technology. With so much potential, it is no wonder that the IT sector is one of the most exciting industries to be a part of today.

IT Sector

The beginning of the information technology industry can be dated to when major corporations started purchasing computers to automate their business processes.. In the early days, a few large companies, such as *IBM* and *Microsoft*, who controlled the majority of the market, dominated the IT sector. However, over time, the IT sector has become more competitive, with a number of smaller companies providing *innovative products* and *services*. Today, the IT sector is a key driver of the global economy, with businesses of all sizes relying on technology to operate.

History of computing:

- The ***abacus***, a straightforward calculator employed in pre-industrial countries, is sometimes regarded as a starting point when tracing the origins of computers. The Chinese mathematician *Zhu Zhitong* is frequently credited with creating the abacus, which was the earliest calculator known to have been used in China.
- Blaise Pascal invented the first mechanical calculator in the 17th century. It is thought that ***Pascal's mechanical calculator,*** which could perform addition, subtraction, multiplication, and division, was the first one that could be used for a variety of tasks.

- *Charles Babbage* created the ***Analytical Engine*** in the 19th century with the intention of using it as a general-purpose computer. However, due to technical issues, the machine was never finished.
- The ***theory of computing*** developed by *Alan Turing* in the 20th century served as the basis for the creation of electronic digital computers.
- The **ENIAC**, which was created during World War II to compute artillery firing tables, was the first electronic digital computer.
- The **EDVAC**, which was intended to be a general-purpose computer, came after the ENIAC.
- The **UNIVAC I**, which was given to the US Census Bureau in 1951, was the first electronic digital computer with a commercial release.
- *Ada Lovelace* wrote the ***first program*** in 1843. It was a set of instructions for calculating a sequence of Bernoulli numbers on *Charles Babbage's analytical engin*e, a machine that was designed to perform mathematical calculations.

MAJOR INVENTIONS AND THEIR EVOLUTION

INTERNET

History of Networking:

The ***history of the Internet*** began with the development of electronic computers in the *1950s.* Initial concepts of wide area networking originated in several computer science laboratories in the United States, United Kingdom, and France.

- The US Department of Defense awarded contracts as early as the *1960s* for packet network systems, including the development of the ***ARPANET***. The first message was sent over the ARPANET from computer science *Professor Leonard* Kleinrock's laboratory at University of California, Los Angeles **(UCLA)** to the second network node at Stanford Research Institute (SRI).
- ***Packets*** were the foundation for the development of the Internet. They are small pieces of data that are routed between computers on the network.
- The development of the Internet protocol suite ***(TCP/IP)*** in the 1970s led to the development of the Internet as a global network.
- First version of the 802.11 standard for ***Wi-Fi*** was introduced in June ***1997,*** providing transmission speeds up to 2 Mbps.
- The Wi-Fi Alliance introduced ***WPA3*** encryption for Wi-Fi in January ***2018***, which includes security enhancements over WPA2.

Evolution of Internet:

The ***Internet*** *has come a long way* since it was first introduced in the early ***1970s****.*

- *Early versions* of the Internet were limited to government and academic institutions, but the Internet has since become widely available to the public. Today, there are over **3 billion** people using the Internet around the world. The Internet has undergone several major evolutions since its inception.
- The *first* major evolution was the introduction of the ***World Wide Web*** in the early ***1990s****.* The World Wide Web made it possible for people to access the Internet using a graphical user interface, and it drastically increased the number of people using the Internet.
- The *second* major evolution was the introduction of ***high-speed Internet access*** in the late ***1990s***. This made it possible for people to access the Internet at speeds that were much faster than the dial-up speeds that were previously available.
- The *third* major evolution was the introduction of ***broadband Internet access*** in the early ***2000s.*** Broadband Internet speeds are even faster than high-speed Internet speeds, and this made it possible for people to do more online than ever before.
- The *fourth* major evolution was the introduction of ***mobile Internet access*** in the late ***2000s.*** This made it possible for people to access the Internet using their mobile phones and other mobile devices.
- The *fifth* major evolution is the ongoing transition to the next-generation Internet, which is being designed to be even faster and more scalable than the current Internet.
- This next-generation Internet is being built on a foundation of ***optical fiber***.

Future of Internet:

The future of the internet is very exciting. We can expect faster speeds, more reliable connections, and new applications and services that we cannot even imagine today.
The Internet has revolutionized communication, commerce, and entertainment. It has become an integral part of our lives. It has changed the way we work, play, and even think.

Introduction in Pakistan:

Internet, in the form of international USENET newsgroups, was introduced in Pakistan in 1993. It was meant to provide dial up and e-mail service to general public and support to projects related to education and other areas. By the end of 2001, there were as many as 50 internet Service Providers in the country

MESSAGING

History of Messaging:

- Samuel Morse, who also developed the telegraph, created the ***first messaging system*** in the early ***1800s.***
- Gordon Bell and Dale Green at MIT created the first messaging system in ***1965.*** This system, called ***"MAILBOX***" was used to send messages between users on the same time-sharing computer system.

- In ***1971***, Ray Tomlinson, also at MIT, expanded on this idea and developed the ***first email system***. This system allowed messages to be sent between users on different computers.
- The first commercial messaging system was launched in ***1980*** by ***Cellular One***. This system, called ***"Short Message Service"*** (SMS), allowed customers to send short text messages to one another. SMS quickly became popular, and by 2010, over 6 billion SMS messages were being sent every day.
- In the late ***1990s***, a new type of messaging system began to emerge ***instant messaging (IM)***. Instant messaging allows users to send messages in real-time, without having to wait for the recipient to be available.

A number of different instant messaging platforms have been developed, the most popular of which are *WhatsApp, Facebook Messenger*, and *WeChat*. As of 2018, there are over 3 billion active users of messaging apps worldwide. messaging apps are continuing to grow in popularity, with new features and capabilities being added all the time.

Major Messaging Applications:

Gmail is a free email service developed by Google. Users can access Gmail on the web and using third-party programs that synchronize email content through POP or IMAP protocols. Gmail offers users 15 gigabytes of storage for emails and attachments, as well as providing access to Google Calendar and Google Drive.

A ***chatroom*** is an online space where people can communicate with each other in real time. Chatrooms are typically organized around a certain topic, and users can come and go as they please. There are multiple of chatrooms available on the internet, ranging from those that are specific to a certain interest or topic, to those that are more general in nature. No matter what type of chatroom you are looking for, there is sure to be one out there that is perfect for you. Chatrooms have been around since the early days of the internet, and they remain a popular way to communicate online.

History of Chatrooms:

- The *first chatrooms* were created in the 1970s, and primarily computer programmers and other tech-savvy people used them.
- In the 1980s, chatrooms began to be used by a wider variety of people, and they became increasingly popular in the 1990s.

Today, chatrooms are used by people of all ages and from all over the world.

WhatsApp:

- Ex-Yahoo employees Jan Koum and Brian Acton founded WhatsApp in 2009
- The app was originally designed as a way to let people communicate without using SMS

- WhatsApp quickly rose in popularity, especially in international markets
- In 2014, Facebook acquired WhatsApp for $19 billion
- WhatsApp has continued to grow in popularity and now has over 1.5 billion active users

Voice Messaging:

Voice messaging is a type of communication in which the sender records a message for the recipient. The message is typically played back over the phone, but can also be played back on a computer or other type of device. Voice messaging can be used for personal or business purposes.

History of Voice Messaging:

- The first voice messaging system was created in the late 1950s, and allowed people to record messages and send them to one another via telephone.
- In the early 1990s, the first voice messaging services were introduced. These services allowed users to send recorded messages to one another over the phone.

Voice messaging quickly became a popular way to communicate, especially for those who were unable to speak on the phone. There are many different voice messaging services available, and the technology continues to evolve.

Voice Messaging Applications

There are many popular voice messaging applications, such as WhatsApp, WeChat, Line, Viber, and others. These apps allow users to easily send voice messages to contacts with a few taps.

Future:

This was a major breakthrough at the time, and opened up a whole new way for people to communicate. In the 1980s, voice-messaging systems began to be used in businesses, as a way to leave messages for employees who were not at their desks. This quickly became a popular way to communicate, and led to the development of more sophisticated systems that could handle multiple messages and had various features such as the ability to send messages to groups of people. Today, voice messaging is an essential part of many people's lives. It is used for both personal and business purposes, and has become a very convenient way to stay in touch with others. There are many different types of voice messaging systems available, and new features are being added all the time.

Video Messaging

Video messaging has a long and complicated history.

- The first video call was made in *1964,* using a system called ***Picture phone***. This system was very expensive, and it did not gain much traction.
- In the ***1970s*****,** a company called **RCA** developed a similar system called the ***CED system***, which was also very expensive and did not gain much popularity.

- In the ***1980s*****,** a number of companies developed ***video conferencing systems***, which allowed businesses to communicate with each other using video. These systems were much more affordable than the earlier systems, and they became quite popular.
- In the ***1990s***, the internet became widely available, and a number of companies developed software that allowed people to make video calls over the internet. These systems were much more affordable than the earlier systems, and they quickly became very popular.
- In the early ***2000s***, a number of companies developed mobile phone video messaging systems. These systems allowed people to send video messages to each other using their mobile phones.

Video Messaging Applications

There are many different famous video messaging applications available. Some of the most popular ones include *Skype, Google Hangouts, and FaceTime*. Each of these applications has its own unique features and benefits.

- ***Skype*** is a great choice for those who need to make international calls, as it offers very low rates.
- ***Google Hangouts*** is perfect for those who want to keep in touch with friends and family members who live far away.
- ***FaceTime*** is ideal for those who want to have a video conversation with someone in real-time.

Today, there are a number of different video messaging systems available, and they are all very popular.

Future:

As video messaging applications continue to grow in popularity, it is likely that they will become even more widely used in the future. This could lead to more features being added to these applications, making them even more useful and user-friendly. Additionally, as more people use these applications, they will become more refined and efficient.

TELEPHONES

History of Telephones:

- Alexander Graham Bell invented the first telephone in ***1876***. The first call was made between Bell and his assistant, *Thomas Watson*.
- The first public telephone was installed in ***1877*** in *New Haven, Connecticut*. . It was placed in the office of the New Haven District Telephone Company. By the end of the 19th century, there were more than *150,000* telephones in the United States. In ***1876***, Bell was working on a way to transmit music over telegraph wires. He accidentally discovered that he could also transmit human speech. Bell filed for a patent on March 7, 1876. The patent was issued on March 10,

1876. The first call was made on March 10, 1876. Bell spoke the famous words, ***"Mr. Watson, come here, I want to see you."*** Watson heard the words over the wire and came to the room where Bell was.

- In ***1878***, the first long distance call was made between *Boston* and *New York City*.
- In ***1885***, the first telephone directory was published in New Haven, Connecticut. It had 50 names.
- In ***1891***, the first *automatic telephone* exchange was opened in *La Porte, Indiana*.
- In ***1895***, the first public pay telephone was installed in *Cleveland, Ohio*.
- In ***1898***, the first long distance call was made between *New York City* and *Chicago*.
- In ***1900,*** there were more than *500,000* telephones in the *United States*.

Evolution of Telephone:

The *evolution of the telephone* has been a long and winding road, with many different inventors and companies contributing to the development of the technology. Early telephones were bulky and expensive, and could only be used by a small number of people. As the technology progressed, telephones became smaller and more affordable, and eventually became an essential part of everyday life. Today, there are many different types of telephones available, from basic landline phones to smartphones with all the latest features.

History of Cellphones:

- The *history of cell phones* started back in early 1900s.
- Martin Cooper invented the first cell phone in 1973.

Description of First Cellphones:

The *first cell phone* was a bulky, hand-held device that weighed about *2.4 pounds*. It was only able to make and receive phone calls. It could only store 30 phone numbers. It was not able to send or receive text messages. The first cell phone was not able to connect to the Internet. It was not able to take pictures. It was not able to play music. It was not able to send and receive email. The first cell phone was not able to access social media sites.

Introduction In Pakistan:

Paktel was granted a license in *early 1990* to operate a cellular telephone network throughout Pakistan. It was the first company granted a free license to carry out cellular phone services in Pakistan. Instaphone and Paktel were the pioneers in mobile communication in Pakistan during the 1990s. They were joined by Mobilink in 1998 which was owned by Motorola until its sale to ORASCOM. The trio offered AMPS services before switching to GSM in the early 2000s.

Smart Phones:

A smartphone is a mobile phone with an advanced mobile operating system that includes features not found in most other phones, such as a full-fledged web browser, email client, multimedia player and camera.

Famous Smartphones:

There are many famous smartphones, but some of the most popular ones include the iPhone, Samsung Galaxy, and Google Pixel. These phones are all popular for different reasons, but they all offer a great experience when it comes to using a smartphone.

GRAPHICAL USER INTERFACE

Graphical user interface **(GUI**) is a type of user interface that allows users to interact with electronic devices in a graphical way, usually using a pointing device such as a mouse, to control the device rather than typing commands.

GUIs can be used in a wide variety of situations, including on *personal computers, mobile phones, video game consoles*, and in-car systems. The history of the graphical user interface can be traced back to the earliest computers, which were often difficult to use and required a high level of technical expertise to operate.

- One of the earliest examples of a GUI was the ***Xerox Star***, which was developed in the early 1980s. This system was designed to make it easy for non-technical users to work with computers. The *Xerox Star* was not a commercial success, but it did inspire other companies to develop their own GUI-based systems.
- *Apple Computer's Macintosh*, released in 1984, was one of the most successful early GUIs. The Macintosh's user interface was based on a concept known as the desktop metaphor, which made it easy for users to understand how to use the system.
- *Microsoft Windows*, first released in 1985, was also inspired by the *Xerox Star.* Windows used a similar desktop metaphor, but it added a number of features that made it more user-friendly than the Macintosh. Windows quickly became the most popular GUI-based operating system, and it remains so today.
- In the 1990s, Apple developed a new GUI known as the ***Aqua interface***. *Aqua* was first used in the company's Macintosh operating system, and it later became the basis for the interface used in the iPhone and iPad.

Today, there are a wide variety of graphical user interfaces available, each with its own unique features and design.

INFLUENTIAL COMPANIES

The IT sector is full of ***influential companies*** that are constantly innovating and driving the industry forward. Here are just a few of the most influential companies in the IT sector.

IBM Corporation

The ***IBM Corporation*** is an American multinational technology company headquartered in Armonk, New York, with operations in over 170 countries.

- The company began in 1911 as the ***Computing-Tabulating-Recording Company (CTR)*** and was renamed "*International Business Machines*" in 1924. IBM manufactures and markets computer hardware, middleware and software, and offers hosting and consulting services in areas ranging from mainframe computers to nanotechnology.
- IBM is also a major research organization, holding the record for most patents generated by a business for 24 consecutive years. Inventions by IBM include the *automated teller machine (ATM),* the *floppy disk, the hard disk drive*, the *magnetic stripe card*, the relational database, the *SQL programming language,* the *UPC barcode*, and *dynamic random-access memory (DRAM)*.
- The IBM mainframe, exemplified by the *System/360*, was the dominant computing platform during the 1960s and 1970s.
- IBM has continually shifted business operations by focusing on higher-value, more profitable markets. This includes spinning off printer manufacturer *Lexmark* in 1991 and the sale of personal computer (*ThinkPad/ThinkCentre*) and x86-based server businesses to Lenovo, acquiring companies such as PwC Consulting (2002), SPSS (2009).

Microsoft Corporation

Microsoft Corporation is a leading American multinational technology company that develops, manufactures, licenses, supports, and sells computer software, consumer electronics, personal computers, and services.

- Its best known software products are the *Microsoft Windows* line of operating systems, the *Microsoft Office suite*, and the *Internet Explorer* and *Edge web browsers*. Its hardware products include the *Xbox game consoles* and the *Microsoft Surface* lineup of touchscreen personal computers.
- Microsoft ranked No. 21 in the 2018 Fortune 500 rankings of the largest United States corporations by total revenue.
- *Bill Gates* and *Paul Allen* founded Microsoft on April 4, 1975, to develop and sell BASIC interpreters for the Altair 8800. It rose to dominate the personal computer operating system market with MS-DOS in the mid-1980s, followed by Microsoft Windows.
- The company's 1986 *initial public offering (IPO),* and subsequent rise in its share price, created three billionaires and an estimated 12,000 millionaires from Microsoft employees.

- Since the 1990s, Microsoft has increasingly diversified from the operating system market and has made a number of corporate acquisitions.
- In May 2011, Microsoft acquired Skype Technologies for $8.5 billion in its largest acquisition to date.

Microsoft has been criticized for its monopolistic business practices, and antitrust lawsuits have been brought against it by competitors and government agencies. The company has also been accused of security and privacy violations, most notably with regard to the surveillance of emails and intrusion into private lives.

Oracle

- Oracle Corporation is an American multinational computer technology company, headquartered in Redwood Shores, California.
- Oracle specializes primarily in developing and marketing database software and technology, cloud engineered systems and enterprise software products, and database management systems.
- It is also the world's second-largest software company by revenue, after Microsoft.
- In recent years, Oracle is investing heavily in *AI, machine learning, IOT,* the *blockchain,* and human interface technologies.

Oracle is among the most innovative in this list of top 10 IT companies in the world.

Accenture

Accenture is a global management consulting and professional services firm that provides strategy, consulting, digital, technology and operations services.
It has been incorporated in Dublin, Ireland, 2009. Accenture has various business units .Accenture consulting provides mobility services and digital marketing analytics; Accenture technology focusses on research and development, technology solution implementation, technology labs for emerging technologies; Accenture strategy provides technology strategy services, business strategy, and operation strategy services. Accenture now has more than 425,000 employees serving clients in more than 120 countries and is known as one of leading tech companies with the best benefits, keeping a spot among the richest and best software companies in the world in 2020

Tata Consultancy Services:

- Tata Consultancy Services Limited *(TCS)* is an Indian multinational information technology (IT) service, consulting and business solutions company headquartered in Mumbai, India. It is a subsidiary of the Tata Group and operates in 46 countries.

- TCS is one of the largest IT companies in the world and one of the top IT services providers for services including consulting, software development, infrastructure support, and business process outsourcing.

- TCS, also one of the top 10 software companies in India — is expanding quickly with the latest technologies like Artificial Intelligence, Machine learning, Internet of things, Cloud Computing and Cyber Security.

Apple:

- Apple is an American multinational technology company headquartered in Cupertino, California, that designs, develops, and sells consumer electronics, computer software, and online services.
- Its hardware products include the *iPhone* smartphone, the *iPad* tablet computer, the Mac personal computer, the *iPod* portable media player, the *Apple Watch smartwatch*, and the *Apple TV digital media player*.
- Apple's consumer software includes the *macOS* and *iOS operating systems*, the *iTunes media player*, the *Safari web browser*, and the *iLife* and *iWork* creativity and productivity suites. Its online services include the *iTunes Store*, the *iOS App* Store and *Mac App* Store*, Apple Music*, and *iCloud.*

SAMSUNG

SAMSUNG, South Korean company that is one of the world's largest producers of electronic devices. Samsung specializes in the production of a wide variety of consumer and industry electronics, including appliances, digital media devices, semiconductors, memory chips, and integrated systems. It has become one of the most-recognizable names in technology and produces about a fifth of South Korea's total exports. The company name, Samsung, came from the Korean for "three stars"

HP Enterprise:

HP is a technology company that operates in more than 170 countries around the world. HP provides a full range of technology solutions, including personal computers, servers, storage, networking, software, printers, and more. HP is a global leader in technology and has been ranked as one of the most admired companies in the world.

The late 1970s and early '80s witnessed the rapid expansion of *Samsung's technology businesses*. Separate semiconductor and electronics branches were established

- In 1978 an aerospace division was created. *Samsung Data Systems* (now Samsung SDS) was established
- In 1985 to serve businesses' growing need for systems development.

That helped Samsung quickly become a leader in *information technology services*. Samsung also created two research and development institutes that broadened the company's technology line into electronics, semiconductors, high-polymer chemicals, genetic engineering tools, telecommunications, aerospace, and nanotechnology.

DELL

Dell is an American multinational computer technology company based in Round Rock, Texas, United States, that develops, sells, repairs, and supports computers and related products and services. Named after its founder*, Michael Dell*, the company is one of the largest technological corporations in the world, employing more than 145,000 people in the U.S. and around the world (Annual report 2018).

Famous Names of IT sector

There are many ***famous names*** in the field of computers, but some of the most notable include Bill Gates, Steve Jobs, and Mark Zuckerberg. These individuals have changed the way we use and think about computers, and their contributions have had a profound impact on the world.

Steven Paul Jobs was an American entrepreneur and business magnate. He was the chairman, chief executive officer (CEO), and a co-founder of Apple Inc., chairman and majority shareholder of Pixar, a member of The Walt Disney Company's board of directors following its acquisition of Pixar, and the founder, chairman, and CEO of NeXT. Jobs is widely recognized as a pioneer of the microcomputer revolution of the 1970s and 1980s, along with Apple co-founder Steve Wozniak.

Bill Gates *is* one of the co-founders of Microsoft Corporation. He is an American business magnate, philanthropist, and investor. He is also the richest man in the world. Gates has contributed a lot to the IT sector. He has been a major driving force behind the growth and development of Microsoft. He has also been instrumental in the development of various software applications and technologies that have revolutionized the IT sector. Gates has also been a major proponent of the use of computers in education and has been working towards making computing accessible to everyone.

Mark Zuckerberg is an American computer programmer and Internet entrepreneur. He is the co-founder of Facebook, and currently operates as its chairman and chief executive officer. His net worth is estimated to be US$56 billion as of December 2020, and he is ranked by Forbes as the fifth richest person in the world. Zuckerberg launched Facebook from his Harvard University dorm room on February 4, 2004. He was assisted by his roommates and fellow Harvard students Eduardo Saverin, Andrew McCollum, Dustin Moskovitz, and Chris Hughes. The group then introduced Facebook to other campuses. Facebook expanded rapidly, reaching one billion users by 2012. Zuckerberg took the company public in May 2012 with one of the largest initial public offerings in U.S. history. Facebook makes most of its revenue from advertisements that appear on the site. Zuckerberg has been criticized for his handling of user data and privacy concerns, as well as for his role in the spread of fake news and misinformation. He has also been criticized for censoring conservative news outlets on Facebook.
There are over ***2 billion*** active users on Facebook, so it is hard to determine which country has the most. However, according to recent estimates, it is thought that India has the most Facebook users of any country in the world.
The United States has the most Instagram users.
There are over ***1.5 billion*** WhatsApp users in over 180 countries. India has the most WhatsApp users with over 200 million active users.

TRENDS IN TECHNOLOGY

Artificial Intelligence

Artificial intelligence (AI) is the simulation of human intelligence by machines. It has been defined in many ways, but in general it can be described as a way of making a computer system "*smart*" that is, able to understand complex tasks and carry out complex commands. The history of AI is often divided into three periods:

1. The Pre-History of AI (before 1950)
2. The Early History of AI (1950-1980)
3. The Modern History of AI (1980-present)

Pre-History of AI (before 1950):

- The first recorded idea of artificial intelligence is often attributed to the ***Greek myth of Pygmalion***, in which a sculptor falls in love with a statue he has created.
- In the Middle Ages, there were many stories of mechanical men and women, such as the *Golem of Prague* and the *Brazen Head of Ireland.*
- In the 17th century, René Descartes proposed that animals were nothing more than automata, and that humans were no different.
- In the 19th century, Charles Babbage designed a "difference engine", which could be programmed to perform simple mathematical calculations. However, the machine was never completed.
- In the early 20th century, Alan Turing proposed the Turing test as a way to determine if a machine could be said to be intelligent.

Early History of AI (1950-1980):

- The first working *AI programs* were written in the *1950s.* These programs were able to solve simple problems, such as tic-tac-toe, and were based on early work in logic and mathematics.
- In *1956,* a group of researchers at a conference in Dartmouth, Massachusetts, laid out the goals for the field of AI. This event is often considered the birth of AI as a discipline.
- In the 1960s and 1970s, AI research was fueled by the Cold War, as both the US and USSR saw AI as a way to gain an advantage over the other. This led to a number of breakthroughs, such as the *creation of expert systems* and *the first working robotic hand*. However, AI also suffered from a number of setbacks, such as the collapse of the Lighthill report in the UK, which led to a decrease in funding for AI research.

Modern History of AI (1980-present):

- In the 1980s, AI research was revitalized by the commercial success of expert systems, and the launch of the *space shuttle program*, which made use of AI technology.
- In the 1990s, AI witnessed a number of successes, such as the defeat of a *world champion chess player* by a computer, and the development of the first web search engine. However, AI also suffered from a number of failures, such as the stock market crash of 1987 and the failure of the AI company Cyc to develop a "*common sense*" database.

- In the early 21st century, AI is being used in a variety of ways, such as *self-driving cars, facial recognition*, and *personal assistants* such as *Siri and Alexa.*

Future

There is no doubt that artificial intelligence (AI) is rapidly evolving and growing more sophisticated every day. With the rapid expansion of AI capabilities, the future of AI is both immensely exciting and somewhat uncertain. On the one hand, businesses and individuals are already beginning to reap the benefits of *AI-powered automation* and its ability to boost *efficiency* and *productivity*.

In the future, AI will only become more ubiquitous and integrated into our lives, augmenting our abilities in ways we cannot even imagine. On the other hand, as AI continues to evolve and become more powerful, there is a risk of it becoming uncontrollable and even dangerous. As AI begins to learn, evolve and grow on its own, it could become very difficult for humans to understand or control its actions. As such, it is important to ensure that AI is developed responsibly and with caution, in order to avoid any negative consequences. Overall, the future of AI is both exciting and uncertain. However, as long as we are aware of the risks and handle AI development responsibly, the future looks bright for both individuals and businesses alike.

Applications of Artificial Intelligence

Applications of Artificial Intelligence have been used in a variety of fields including medical diagnosis, stock trading, robot control, law, gaming and toys.

- In the medical field, AI is used to diagnose patients by analyzing their medical history and providing treatment options.
- In stock trading, AI is used to predict stock prices and make investment decisions.
- Robot control is another area where AI is used to provide instructions to robots.
- In law, AI is used to interpret legal documents and predict the outcomes of legal cases.
- In gaming, AI is used to create believable opponents and provide an immersive experience.
- In toys, AI is used to create interactive experiences for children.

Machine Learning

The history of ***machine learning*** can be traced back to the early days of artificial intelligence, when researchers attempted to build systems that could learn from data and improve their performance over time.

- In the *1950s,* a group of scientists at the *University of Cambridge* developed a program called ***SAM***, which was designed to learn from experience and improve its performance at a task over time. SAM was able to learn how to *play checkers* and *solve simple problems*, but it was not able to generalize these skills to new tasks.

- In the *1970s,* a new approach to machine learning called ***neural networks*** was developed. Neural networks are similar to the brain in that they are composed of a large number of interconnected processing units, or neurons. Neural networks can learn by example, and they are able to generalize from data to solve new problems.
- In the *1980s*, a new type of neural network called a ***convolutional neural network*** was developed*. Convolutional neural networks* are able to learn from data that is spatially arranged, such as images.
- In the *1990s*, machine learning was used in a variety of applications, including ***facial recognition***, ***handwriting recognition***, and ***speech recognition***.
- In the *2000s*, machine learning was applied to more complex tasks such ***as natural language processing*** and ***computer vision***.

Today, machine learning is used in a wide variety of applications, including search engines, *self-driving cars*, and *medical diagnosis.* Machine learning is an active area of research, and new techniques are being developed all the time.

Future

The future of machine learning is shrouded in potential but fraught with uncertainty. But despite the many unknowns about the future, there are a number of factors that suggest that machine learning will become increasingly important. First, fast-moving technical advances are erasing the divide between human and machine capabilities, and devices are becoming more and more embedded into our everyday lives. However, there are also a number of challenges that need to be addressed before machine learning can truly fulfill its potential.

- Machine learning algorithms need to become more explainable so that humans can trust them
- Data needs to be better quality and more representative of the real world in order for machine learning models to be effective.
- There need to be better mechanisms for accountability so that people can be held responsible for the actions of machine learning systems.

Applications:

Machine learning is a branch of artificial intelligence that deals with the design and development of algorithms that can learn from and make predictions on data. Some of the most popular applications of machine learning include:

- ***Recommendation systems***: Recommendation systems are used to predict what a user might want to buy or watch. They are used by online retailers (such as Amazon and Netflix) and social media platforms (such as Facebook and YouTube).
- ***Search engines***: Search engines use machine learning to improve the quality of their search results.
- ***Spam filters***: Spam filters use machine learning to identify and block spam emails.

- ***Fraud detection***: Machine learning is used to detect fraudulent activities, such as credit card fraud and insurance fraud.
- ***Predictive maintenance***: Predictive maintenance is a technique used to predict when equipment is likely to fail. This allows businesses to schedule maintenance before the equipment breaks down, which can save money and downtime.
- ***Robotics***: Robotics is an area where machine learning is being used increasingly. Robots are able to learn from data and experience, which allows them to perform tasks that are otherwise difficult or impossible for humans to do.

This trend is likely to continue, as machine learning becomes more widely used and better understood. There are many different types of machine learning, but some of the most common are supervised learning, unsupervised learning, and reinforcement learning.

- ***Supervised learning*** is where the data is labeled and the algorithm is trained to learn from it.
- ***Unsupervised learning*** is where the data is not labeled and the algorithm has to find patterns in it.
- ***Reinforcement learning*** is where the algorithm is given a reward for making correct predictions, and it learns by trying to maximise its rewards

Robotics

The history of ***robotics*** were found back to the early 20th century.

- The first robot was created by Czech writer ***Karel Čapek*** in his play R.U.R. (Rossum's Universal Robots), which debuted in 1921. The word "robot" itself comes from the play.
- In the 1940s and 1950s, science fiction authors such as *Isaac Asimov* and *Arthur C. Clarke* wrote about robots in their stories. Asimov even came up with ***Three Laws of Robotics***, which are still used in many fictional works today.
- The first real robot was created in 1954 by ***George Devol***. His invention, called ***UNIMATE***, was able to perform simple tasks such as welding and moving objects***. UNIMATE*** was later bought by General ***Motors,*** who used it in factories.

Today, robots are used in many different industries, from manufacturing to healthcare. They are becoming more and more advanced, and it is likely that they will play an even bigger role in our lives in the future.

Future:

The future of robotics is full of surprises. But despite the many unknowns about the future, there are a number of factors that suggest that robotics will become increasingly important.

- First, the declining cost of robotics technology is making it more accessible to a wider range of users.
- Second, the rapid pace of technological change is likely to continue to create new opportunities for robotics.

- Finally, the blurring of the lines between humans and machines is likely to lead to a more intimate relationship between people and robots.

Applications:

Robotics technology has revolutionized manufacturing, design and communication across factories. However, industrial applications are not the only ones benefiting from this versatile technology. Here are five other interesting applications of robotics that you may not be aware of.

- ***Healthcare Robots*** are increasingly being used in healthcare, both in hospitals and homes. For example, the da Vinci surgical system is a robot that assists surgeons with delicate and complex procedures. In *hospitals*, robots are also used to transport medicines and supplies. At home, robots such as the *Roomba vacuum* cleaner can help seniors with cleaning and other domestic tasks. In the future, robots may also be used to provide personal care and assistance, such as helping with bathing, dressing and grooming.
- ***Retail Robots*** are being used more and more in retail settings, from large stores to small convenience shops. For example, *Walmart* is using robots to scan shelves and track inventory, while *Amazon* is using them to pick and pack orders in their warehouses. In addition, some stores are using robots as customer service assistants. For example, *Lowe's* has started using LoweBots in select stores to help customers find products and provide product information.
- ***Food service Robots*** are also being used in the food service industry. For example, some restaurants are using robots to cook and prepare food. In addition, robots are also being used to serve food and drinks, and even to clean up afterwards.
- ***Transportation Robots*** are being used in transportation in a variety of ways. For example, some companies are using robots to load and unload trucks. In addition, robots are also being used to clean up highway spills and to inspect bridges and tunnels. In the future, robots may also be used to drive vehicles. *Google, Tesla* and a number of other companies are already working on this technology.
- ***Education Robots*** are being used in education in a variety of ways. For example, they are being used to teach children how to code. In addition, robots are also being used as teaching assistants in classrooms and as part of educational toys and games.

In the future, robots may also be used to provide personalised education, such as tutoring and mentoring.

Cyborgs:

A ***cyborg*** is a being with both organic and artificial components.

The term was first coined in 1960 by *Manfred Clynes* and *Nathan S. Kline*, who wrote about the advantages of creating enhanced humans for space exploration. Since then, the term has come to be used more broadly, referring to anyone with significant implants or artificial parts. This can include everything from people with pacemakers to those with enhanced limbs or artificial organs. Cyborgs are often seen as a symbol of the future, where technology and humanity merge to create something new and improved. However, they can also be seen as a sign of our growing reliance on technology, and some worry that we are losing our humanity by becoming more machine-like.

Since then, cyborgs have been a staple of science fiction, appearing in everything from films to video games. In recent years, there has been an increase in the use of cyborgs in military and law enforcement, as well as in the medical field.

Future:

In the *future*, cyborgs will be more common than ever before. They will be used in a variety of ways, from helping people with disabilities to performing dangerous tasks. Some cyborgs will even be used as soldiers.

Applications:

Cyborgs are beings that have both organic and mechanical parts. They are often used in stories and movies as characters that are half human and half machine. Some common applications for cyborgs include:

- ***Military:*** Cyborgs can be used as soldiers or spies. They can be equipped with advanced weaponry and armor, making them deadly opponents on the battlefield.
- ***Science and medicine:*** Cyborgs can be used for medical purposes, such as to replace lost limbs or organs. They can also be used for scientific research, such as exploring extreme environments or conducting dangerous experiments.
- ***Crime:*** In some stories, cyborgs are used as criminals or mercenaries. Their mechanical parts can make them very difficult to capture or kill, and their inhuman strength can be used to terrorize or destroy.
- ***Entertainment:*** Cyborgs are often used as characters in movies, TV shows, and video games. They can be used to add excitement or suspense to a story, or simply to provide a unique and interesting character for audiences to enjoy.

Cybersecurity

The ***history of cybersecurity*** is a long and complicated one, with roots that go back centuries. In modern times, the field of cybersecurity has grown and evolved rapidly, in response to the increasing threats posed by digital technology. The term "***cybersecurity***" was first coined in the early *1990s*, but the concept of protecting computer networks and systems from attack is much older.One of the earliest examples of cybersecurity comes from the Second World War, when the Allies used code-breaking to decipher Nazi messages.

In the years since, the threat of cyberattacks has grown exponentially, as both state-sponsored hackers and criminal gangs have increasingly targeted businesses and government agencies. In response, the cybersecurity industry has boomed, with billions of dollars being spent each year on developing new technologies and solutions. Despite these efforts, however, the number of successful cyberattacks continues to rise, highlighting the need for continued vigilance and investment in cybersecurity.

History Of Cyber Attacks:

- In *1940*s, the possibility of replicating computer programs is floated.
- In *1950*s, *Core Wars*, a game that vies for control of the computer, launches.
- In *1960*s, Game of Life, a life-emulating program, comes to life.
- In *1970*s, The first true self-replicating programs launch.
- In *1971*, "*I'm the creeper, catch me if you can*" scrolls across computer screens.
- In *1983*, Patent for a "cryptographic communications system and method" is granted and the term "***computer virus***" is born.
- In *1986*, The "***Pakistani Brain***" virus becomes the first to cause serious damage, U.S. passes the Computer Fraud and Abuse Act (CFAA).
- In *2000*, *Mafia boy* brings down major websites, causing an estimated $7.5 million in damages.
- In 2000, *ILOVEYOU* virus attacks tens of millions of Windows PCs, causing email systems to crash.
- In *2003*, Anonymous launches a DDoS attacks on the Church of Scientology.
- In *2006*, More than 45.7 million customer records stolen in TJX Companies attack.
- In *2010*, *Google* announces an attack on its infrastructure in China.
- In *2017,* Linked to Russian intelligence, APT28 (Fancy Bear), launches a cyberespionage campaign against the Montenegrin government.
- In *2018*, U.S. intelligence reveals a U.S. military program aimed at gleaning information from terrorists' computers.
- In *2018*, China-linked hackers target U.S. and Southeast Asian firms to intercept their military and civilian communications.

Future:

The number and sophistication of cyber threats are increasing at an alarming rate, while our ability to defend against them seems to be lagging behind. The good news is that there are many talented people working hard to improve our cybersecurity posture and there are many new technologies and approaches that hold promise.

The bad news is that it is not clear if we will be able to keep up with the ever-evolving threat landscape. One thing is certain, the future of cybersecurity will be complex and challenging. We need to be prepared for a wide range of threats, from nation-state actors to criminal gangs to lone-wolf hackers. We need to be able to defend against traditional attacks as well as new and emerging threats. And we need to be able to do all of this while ensuring that our critical infrastructure remains online and accessible.

Fortunately, there are many talented people working hard to improve our cybersecurity posture and there are many new technologies and approaches that hold promise. With the right mix of people, technology, and strategy, we can overcome the challenges of the future and keep our digital world safe.

Internet Of Things:

Internet of Things (IoT) is a system of physical objects, devices, and sensors that are connected to the internet and can collect, exchange, and act on data. These objects can be anything from cars and home appliances to wearable devices and industrial machines. The concept of the Internet of Things has been

around for many years, but it has only recently become a reality due to advances in technology. The term “Internet of Things” was first coined by *Kevin Ashton* in 1999. The IoT is made possible by a number of technologies, including *sensors, RFID tags*, and *wireless networking*. These technologies allow devices to be connected to the internet and to communicate with each other.
The IoT has a number of potential applications, including in healthcare, transportation, and manufacturing.

- ***Healthcare***: IoT devices can be used to monitor patients’ vital signs and to provide remote diagnosis and treatment.
- ***Transportation***: IoT devices can be used to track vehicles and to monitor traffic conditions. In manufacturing, IoT devices can be used to track inventory and to monitor production processes.

The IoT is still in its early stages, and there are many challenges that need to be addressed before it can reach its full potential. These challenges include privacy and security concerns, as well as the need for standards and interoperability.

Applications

Internet of Things technology can be used in a number of ways to increase efficiency and productivity in various industries. In the healthcare industry for example,

- Internet of Things technology can be used to keep track of inventory levels of medical supplies, to monitor patients' vital signs remotely, and to automatically schedule appointments and prescription refill reminders. In the manufacturing industry
- Internet of Things technology can be used to track the progress of production line items, to schedule maintenance and repairs, and to optimize energy usage.
- In the retail industry, Internet of Things technology can be used to track customer behavior in order to provide personalized recommendations, to manage stock levels in real-time, and to enhance the in-store customer experience.
- In the transportation industry, Internet of Things technology can be used to monitor traffic patterns, to manage fuel consumption, and to provide real-time updates on the location of vehicles and shipments.

Future

The future of the internet of things is looking very bright. With the rapid advancement of technology, the internet of things is expected to grow exponentially in the coming years. There are many potential applications for the internet of things, ranging from smart homes to connected cars and much more. With the vast amount of data that the internet of things can collect, it has the potential to revolutionize the way we live and work.

FUTURE PROJECTIONS

- **Smarter devices** are those that are able to connect to the internet and provide users with more information and functionality than traditional devices. They often have sensors and can be controlled remotely.
- **Quantum computing** is a type of computing where information is processed using quantum bits instead of classical bits. This makes quantum computers much faster and more powerful than traditional computers.
- **Datafication i**s the process of turning data into a more easily understandable and usable format. This can be done through the use of data visualization, data mining, and other data-related techniques. Datafication is often used to make large data sets more manageable and to extract valuable insights from them. It is also used to create new products and services that are based on data.
- **Extended reality (XR)** is a catch-all term for a variety of immersive, augmented, and virtual reality experiences. XR is an umbrella term that includes all forms of immersive media, including virtual reality (VR), augmented reality (AR), mixed reality (MR), extended reality (XR), and any other form of immersive experience. XR is a way to blur the lines between the physical and digital worlds. It can be used for *gaming*, *entertainment, education, training*, and more. XR can be used with or without a headset. When used with a headset, XR can provide a fully immersive experience. without a headset, XR can be used to augment the physical world around you. XR is still in its early stages, and there is no one-size-fits-all solution. There are many different platforms and technologies to choose from, and the best one for you will depend on your needs and preferences.
- **Digital trust** is the confidence people have in a digital product or service to protect their information and provide a safe, secure experience. It's also the belief that a company will use customer data responsibly and keep their promises about privacy.
- **3D** printing is a process of making three-dimensional solid objects from a digital file. The creation of a 3D printed object is achieved using additive processes, where an object is created by laying down successive layers of material until the object is complete. Each of these layers can be seen as a thinly sliced horizontal cross-section of the eventual object.

  Applications:
  3D Printing technology has been around for over 30 years, but has only recently become widely available and affordable for consumers. This technology allows users to create three-dimensional objects from a digital file, using a variety of materials including plastic, metal, and ceramic. 3D Printing has a wide range of applications, from creating prototypes for new products to printing custom parts for machines. It can also be used to create artwork, jewelry, and even food.

- **Virtual reality** can be used for many different applications. For example, it can be used for training and simulation, for *entertainment* and *gaming*, for educational purposes, for product design and engineering, and for many other tasks.
- **Blockchain** is a digital ledger of all cryptocurrency transactions. It is constantly growing as "*completed*" blocks are added to it with a new set of recordings. Each block contains a cryptographic hash of the previous block, a timestamp, and transaction data. Bitcoin nodes use the block chain to differentiate legitimate Bitcoin transactions from attempts to re-spend coins that have already been spent elsewhere.
  Blockchain is being used for a variety of other applications.
  a) *Supply Chain Management*: Blockchain can be used to track goods as they move through a supply chain. Walmart is using blockchain to track the movement of pork in China.
  b) *Identity Management*: Blockchain can be used to create a digital identity for individuals, businesses, or objects. This could be used for things like Know Your Customer (KYC) compliance or for voting.
  c) *Healthcare:* Blockchain can be used to securely store patient health records and to track the movement of medical supplies.
  d) *Real Estate*: Blockchain can be used to streamline the process of buying and selling property. For example, the Republic of Georgia is using blockchain to streamline the land registration process.
  e) *Art:* Blockchain can be used to verify the authenticity of art, and to track the ownership history of a piece of art.

- **5G technology** is still in development and has not yet been commercialized. However, when it is eventually deployed, it is expected to offer a number of advantages over existing 4G networks, including higher data rates, lower latency, and improved capacity.
  These benefits are expected to enable a number of new and innovative applications, including:
  a) *Enhanced mobile broadband*: 5G is expected to provide significantly higher data rates than 4G, making it ideal for data-intensive applications such as high-definition video streaming and virtual reality.
  b) *Low-latency applications*: The reduced latency of 5G is expected to enable new applications that require real-time or near-real-time communication, such as autonomous vehicles and remote surgery.
  c) *Massive IoT:* The improved capacity and coverage of 5G is expected to enable the deployment of massive IoT networks, supporting billions of connected devices.
  d) *Critical communications*: The high data rates and low latency of 5G is expected to make it suitable for critical communications applications such as public safety and emergency services.
  e) *Fixed wireless*: 5G is expected to enable the deployment of fixed wireless networks that can provide high-speed broadband access in rural and underserved areas.

- **Cloud computing** is the on-demand availability of computer system resources, especially data storage and computing power, without direct active management by the user.

- **Common applications** of cloud computing include storage, backup and recovery, testing and development, big data analytics, and more. Cloud computing can be used to improve the agility and efficiency of an organization while reducing costs.

Future Predictions for IT sector

Practice revealed the top technological predictions that will be booming in the next few years.

- In *2029*, ***11 petabytes*** of storage that can store DVD quality videos to be played over 600 years without stopping 24 hours a day, will be available for $ 100.
- In the next *10 years*, we will witness an increase of ***20 times*** the speed of home internet networks.
- In 2023, wireless network traffic will reach 400 petabytes per month. Today, networks around the world transfer data to more than ***9 exabytes*** *per month*.
- The internet will evolve into a means of instant communication, regardless of distance. .
- In *2030*, the ability to process a $ 1,000 PC will be balanced with the ability of a human brain.
- In *2050* (assuming that the world's total population is 9 billion), the ability to process a $ 1,000 PC will be balanced with the overall brain capacity of humans on earth.
- Today, we know ***5%*** of what we will know in the next 50 years. In other words, in 50 years, 95% of what we will know is found in previous years.
- Data in the world will increase six fold in the next *two years*, while company data will increase fifty-fold.
- In *two years*, information on the internet will multiply every 11 hours.
- In the *next five years,* any surface can be used as a display screen.
- In 2025, ***teleportation*** at the particle level will begin to be realized.
- In 2030, ***artificial brain*** planting can be done.

Recommendations

I think IT sector is not only swiftly progressing but by introduction of new technology everyday, it is becoming more and more saturated. But I believe there are still a lot of opportunities if you are willing to look for them. Future of AI is very bright and in no time it will be able to do everything for us. However, there are some sectors where the progress will be revolutionary like 5G technology and Robotics but will also pose harmful threats.

- Stephen Hawking was probably the most well-known and bright minds of our generation. He advocated about the dangers of artificial intelligence. He hinted at the fact that super smart software could spell the end of our species and lead to an *apocalyptic* scenario similar to the *Matrix or Terminator*. One of the most interesting things he mentioned is that while humans are limited to slow *biological evolution*, machines are able to change rapidly and reproduce quickly, meaning that we would likely be unable to compete and go extinct.

- The rapid increase in emerging technologies suggests that they are having a substantial impact on the workforce. Many of the large tech firms have achieved broad economic scale without a large number of employees. For example, Derek Thompson writes: “Google is worth $370 billion but has only about 55,000 employees—less than a tenth the size of AT&T’s workforce in its heyday [in the 1960s].”According to economist Andrew McAfee: “We are facing a time when machines will replace people for most of the jobs in the current economy, and I believe it will come not in the crazy distant future.”
- 5G can also be harmful health. For example, tissue heating, impaired cognitive function and EMFs are “possibly carcinogenic” to humans

INDUSTRIES

The Information Technology sector is made up of a wide range of ***industries*** that are responsible for the development, management and distribution of information and data. The IT sector is made up of four main industries:

1. The computer hardware industry
2. The computer software industry
3. The computer services industry
4. The telecommunications industry
5. The Semi-conductor industry

The ***computer hardware industry*** comprises businesses that produce and sell computer hardware. This industry includes companies that manufacture and sell personal computers, servers, storage devices, networking equipment, and other computer components. The global computer hardware market is expected to reach *$374.8* billion by *2025*, up from *$351.3 billion* in *2020*. The industry is forecast to grow at a compound annual growth rate (CAGR) of *2.4%* from *2020* to *2025*. The industry is highly competitive, with a large number of manufacturers competing for market share. The top five vendors in the global computer hardware market are *HP, Dell, Lenovo, Apple, and Asus*.

The ***computer software industry*** comprises businesses that develop and market software products. The industry includes a wide range of products, including operating systems, application software, middleware, and software as a service (*SaaS)*. The global computer software industry is highly competitive, with a large number of players. The top five firms in the industry, Microsoft, Apple, Google, Oracle, and SAP, accounted for about 60 percent of the industry's revenue in 2015. The industry is forecast to grow at a compound annual growth rate (CAGR) of 6.9 percent from 2016 to 2020. The computer software industry is concentrated in a few key geographic markets, including the United States, Europe, and China. The United States is the largest market for computer software, accounting for about 38 percent of the industry's revenue in 2015. Europe is the second-largest market, accounting for about 28 percent of the industry's revenue. China is the third-largest market, accounting for about 11 percent of the industry's revenue. The computer software industry is forecast to continue to grow at a strong pace in the coming years. The industry's growth will be driven by the increasing penetration of software products in emerging markets, the continued adoption of cloud-based software solutions

The ***computer services industry*** comprises establishments primarily engaged in providing information technology (IT) services. These services include computer systems design and related services, computer facilities management services, application software services, Web page design services, and data processing, hosting, and related services. The computer services industry is composed of a wide variety of establishments that vary greatly in terms of size, scope, and specialization. The largest and most complex establishments in the industry are known as systems integrators. These enterprises typically

provide a broad range of IT services and solutions to their clients, including computer systems design, application software development, and network integration and management. Other establishments in the industry, such as Web page design services and data processing services firms, are much smaller and typically provide only a few IT services. The computer services industry has experienced significant growth in recent years as businesses and other organizations have increasingly relied on IT to improve their operations and competitiveness. The industry is expected to continue to grow in the coming years as businesses invest in new and emerging technologies, such as cloud computing and big data analytics, to further improve their efficiency and productivity.

The ***telecommunications industry*** is in a constant state of change. This is due to the ever-changing technology as well as the ever-changing consumer demands. As a result, the telecommunications industry is always looking for ways to improve its services. One way the industry is looking to improve its services is by offering more choices to consumers. The telecommunications industry is offering more choices to consumers in an effort to improve its services. This is done in order to meet the ever-changing demands of consumers. The industry is offering a variety of new services, such as VoIP, that consumers can choose from. In addition, the industry is also offering a variety of new features, such as caller ID, that consumers can choose from.

The ***semiconductor industry*** is a critical part of the IT sector. It is responsible for manufacturing the chips that power computers, mobile devices, and other electronic equipment. The industry has seen tremendous growth in recent years, due in part to the increasing demand for new and innovative electronic products. The semiconductor industry is the aggregate of companies engaged in the design and fabrication of semiconductors and semiconductor devices, such as transistors and integrated circuits. It formed around 1960, once the fabrication of semiconductor devices became a viable business.

SOFTWARE INDUSTRY

History of Software:

The *history of software* go back to the early days of computing, when programmers wrote code in order to create and run programs on early computers. In the early days of software development, there was no such thing as "***software engineering***".

Programmers simply wrote code and hoped it worked. As computers and software became more complex, the need for more organized and structured approaches to software development became apparent.

The first software engineering principles were laid out in the **1968 *NATO Software Engineering* Conference**, which established the need for software engineering methods and tools. Since then, the field of software engineering has evolved rapidly, with new methodologies and tools being developed to

keep up with the ever-changing landscape of software development. Today, software engineering is an essential part of the software development process, and helps to ensure that software is developed in a quality, predictable, and cost-effective manner.

Evolution of Software:

The *evolution of software* is a long and complicated history. It began with the early days of computing, when software was nothing more than a set of instructions for a machine. Over time, software has become increasingly complex, and its development has been shaped by a number of important factors.

One of the most important factors in the evolution of software is the increasing complexity of hardware. As hardware has become more powerful, software has had to become more complex to take advantage of that power. This has led to a feedback loop, where the increasing complexity of software has driven the need for more powerful hardware.

Another important factor is the increasing demands of users. As software has become more essential to our lives, we have come to expect more from it. We want software that is easier to use, that does more than just perform simple tasks, and that is available on a variety of devices. This has placed a great deal of pressure on developers to create software that meets these demands.

The evolution of software is also shaped by the economics of the software industry. The development of new software requires a significant investment of time and money, and the success of a software product depends on its ability to generate revenue. This has led to a focus on creating software that is profitable, which has in turn led to the development of many commercial software products. The history of software is one of continual evolution. As hardware and user demands have changed, software has had to adapt. This process of evolution is likely to continue into the future, as new technologies and new user demands emerge.

TYPES OF SOFTWARE

OPERATING SYSTEMS

Windows

Windows is a personal computer operating system from Microsoft.
It was first released on November 20, 1985, and has been regularly released since then. It is the most popular operating system for personal computers.
Windows was first developed as a graphical user interface (GUI) for MS-DOS, a command-line operating system. MS-DOS was designed for use with a keyboard and did not support the use of a mouse. The Windows GUI made it possible to use a mouse to control the operating system and made it much easier to use for most people.

- Microsoft released the first version of Windows, ***Windows 1.0***, in November 1985. This version was very basic and did not include many of the features we now take for granted, such as the ability to open multiple windows at the same time or to cut and paste text.
- ***Windows 2.0,*** released in December 1987, added support for multitasking and improved the graphical user interface. It was also the first version of Windows to be available in a version for IBM PC compatibles as well as the original IBM PC.
- ***Windows 3.0***, released in May 1990, was a major upgrade that added support for 16-bit color and improved performance. It was also the first version of Windows to be widely popular and to be used on most new personal computers.
- ***Windows 95***, released in August 1995, was a major upgrade that added support for 32-bit programs, the Plug and Play standard, and the first version of the Windows Start menu. It was also the first version of Windows to use the *"WIMP"* (Windows, Icons, Menus, Pointers) user interface.
- ***Windows 98***, released in June 1998, was an incremental upgrade that added support for USB devices and the FAT32 file system.
- ***Windows ME***, released in September 2000, was the last version of Windows to be based on the MS-DOS codebase. It was also the first version of Windows to include system restore and automatic updates. ***Windows XP,*** released in October 2001, was a major upgrade that added support for the NTFS file system, a new user interface, and improved performance. It was also the first version of Windows to be based on the NT kernel.
- ***Windows Vista***, released in January 2007, was a major upgrade that added support for the new Windows Aero user interface, improved security, and improved performance.
- ***Windows 7***, released in October 2009, was an incremental upgrade that added support for multi-touch input, the Windows PowerShell scripting language, and the Windows App Store.
- ***Windows 8***, released in October 2012, was a major upgrade that added support for the new Metro user interface, improved security, and improved performance.
- ***Windows 8.1***, released in October 2013, was an incremental upgrade that added support for high-resolution displays, the Bing search engine, and the SkyDrive cloud storage service.
- ***Windows 10***, released in July 2015, was a major upgrade that added support for the new Universal Windows Platform, the Windows Hello biometric login system, and the Cortana digital assistant.

The first ***DOS (Disk Operating System)*** was developed in 1981 by a company called Microsoft. The first version of DOS was very simple and only allowed for a few basic commands. As the years progressed, DOS became more complex and featured more and more commands. By the early 1990s, DOS was the most widely used operating system in the world. However, in 1995, Microsoft released a new operating system called Windows 95 which slowly began to replace DOS. Today, DOS is no longer as widely used as it once was, but it is still used by some businesses and organizations.

Dumb operating system is a term used to describe a computer operating system that is very simple and lacking in many features. Early versions of Microsoft Windows, for example, were often described as dumb operating systems because they lacked features that were common in other operating systems.

Mac OS

Mac OS is a computer operating system developed by Apple. It is designed to run on *Apple's Macintosh* line of computers. Mac OS is the primary operating system for Apple's Macintosh computers. It is a proprietary operating system, meaning that it is not available for purchase or license to non-Apple computers.

List of all versions of Mac OS:

- OS X 10 beta: Kodiak – September 13, 2000
- OS X 10.0: Cheetah – March 14, 2001 (Latest: 10.0.4)
- OS X 10.1: Puma – September 15, 2001 (Latest: 10.1.5)
- OS X 10.2: Jaguar – August 14, 2002 (Latest: 10.2.8)
- OS X 10.3 Panther (Pinot) – October 24, 2003 (Latest: 10.3.9)
- OS X 10.4 Tiger (Merlot) – April 29, 2005 (Latest: 10.4.11)
- OS X 10.4.4 Tiger (Chardonnay) – January 10, 2006 (for Intel Macs) (Latest: 10.4.11)
- OS X 10.5 Leopard (Chablis) – October 26, 2007 (Latest: 10.5.8)
- OS X 10.6 Snow Leopard – August 28, 2009 (Latest: 10.6.8)
- OS X 10.7 Lion (Barolo) – July 20, 2011 (Latest: 10.7.5)
- OS X 10.8 Mountain Lion (Zinfandel) – July 25, 2012 (Latest: 10.8.5)
- OS X 10.9 Mavericks (Cabernet) – October 22, 2013 (Latest: 10.9.5)
- OS X 10.10: Yosemite (Syrah) – October 16, 2014 (Latest: 10.10.5)
- OS X 10.11: El Capitan (Gala) – September 30, 2015 (Latest: 10.11.6)
- Mac OS 10.12: Sierra (Fuji) – September 20, 2016 (Latest: 10.12.6)
- Mac OS 10.13: High Sierra (Lobo) – September 25, 2017 (Latest: 10.13.6)
- Mac OS 10.14: Mojave (Liberty) – September 24, 2018 (Latest: 10.14.6)
- Mac OS 10.15: Catalina (Jazz) – October 7, 2019 (Latest: 10.15.7, Security Update 2022-005)
- Mac OS 11: Big Sur (Golden Gate) – November 12, 2020 (Latest: 11.6.8)
- Mac OS 12: Monterey (Star) – October 25, 2021 (Latest: 12.5.1)
- Mac OS 13: Ventura – Coming fall 2022

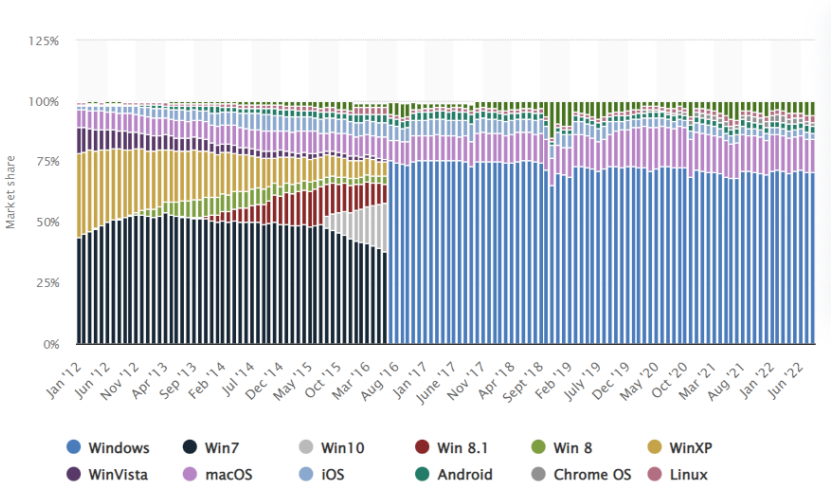

Figure 1. Market shares of Operating Systems

GAMES

History Of Computer Games:

- The ***first computer game*** was created in the early 1950s, and was called "*Tennis for Two*". It was played on an oscilloscope, and was very simple, only featuring a tennis court and two paddles.
- In 1958, a game called "*Spacewar!*" Was created for the newly invented computer, the DEC PDP-1. This was a much more complex game, featuring two spaceships battling each other in space. "*Spacewar!*" Was very popular, and inspired many other programmers to create their own games.
- In the 1970s, video game consoles began to appear in homes, and arcade games became popular. Some of the most popular arcade games were "*Pong*", "*Asteroids*", and "*Pac-Man*". These games were simple, but addictive, and people would spend hours playing them.
- Home video game consoles, such as the *Atari 2600*, allowed people to play these same games in their homes.
- The 1980s saw the advent of personal computers, and with them, a new wave of computer games. These games were more complex than the arcade games, and featured rich graphics and sound. Some of the most popular computer games of the 1980s were "*The Oregon Trail*", "*SimCity"*, and "*The Legend of Zelda*".
- The 1990s were the golden age of computer games. Games became more and more realistic, and featured amazing graphics and sound. Popular games of the 1990s included "*Doom*", "*Quake*", "*Myst*", and "*The Sims*". Today, computer games are more popular than ever. They are played on a variety of platforms, from phones to computers to dedicated game consoles. And with the advent of virtual reality, computer games are only getting more immersive and realistic.

Computer Games Today:

Some of the most popular computer games today include "*Fortnite,"* "*League of Legends*," "*Overwatch,*" and "*Minecraft*." These games are all highly rated by gamers and critics alike, and offer hours of entertainment.

The global game market revenue for 2021 was **$178.2 billion**.

Future:

There is no doubt that computer games are here to stay. The industry is growing at an incredible rate, and the games are becoming more and more realistic and immersive. The future of computer games is very exciting, and there are many new technologies and trends that are going to shape the industry.

Virtual reality is one of the most talked about technologies in the gaming world at the moment. It has the potential to completely change the way we play games, and it is something that is being developed by some of the biggest names in the industry.

Augmented reality is another exciting new technology that is starting to be used in games. This allows players to interact with the game world in a more realistic way, and it is only going to become more popular in the future. There are also many new genres of games that are becoming popular, such as *battle royale* and *survival games*. These games are very different from the traditional games that we are used to, and they are extremely popular with players.

The future of computer games is very exciting, and there are many new and innovative things happening in the industry. It is definitely an exciting time to be a gamer.

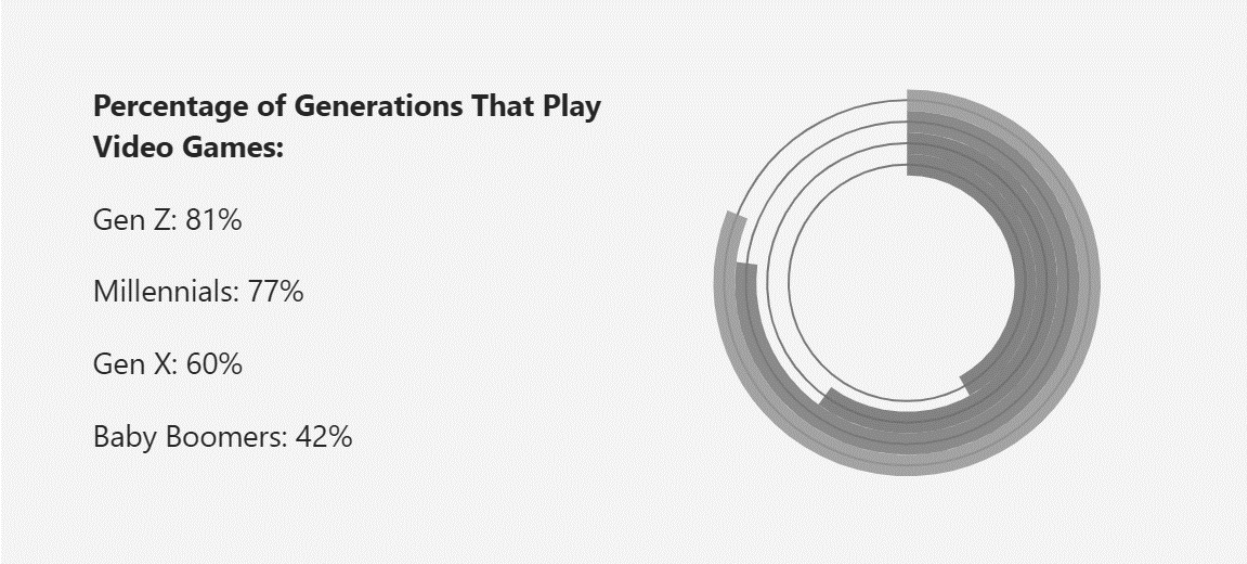

Figure 2 Generations that Play Videogames

Mobile Games:

Mobile games are becoming increasingly popular as people look for ways to stay entertained while on the go. There are a variety of mobile games available, from simple games that can be played in a few minutes to more complex games that require hours of dedication. Whether you're looking for a quick diversion or something more substantial, there's sure to be a mobile game that's right for you.

Mobile Games Today:

Some of the most famous mobile games include "*Candy Crush*," "*Clash of Clans*," "*Pokemon Go*," "Subway Surfers", "*Temple Run*" and "PUBG" These games are all extremely popular and have been downloaded millions of times. They are all free to play, although some do offer in-app purchases.

Future:

There is no doubt that mobile games will continue to grow in popularity in the years to come. With the ever-increasing capabilities of smartphones and tablets, mobile gaming is only going to get better and better. We can expect to see more immersive and exciting games that take advantage of the unique features of these devices. In addition, the rise of *Augmented Reality (AR)* and *Virtual Reality (VR)* technology is likely to change the landscape of mobile gaming even further. We can only imagine what kinds of amazing games will be possible in the future with these cutting-edge technologies

WEBSITES

A *website* is a collection of related web pages, including multimedia content, typically identified with a common domain name, and published on at least one web server. A website may be accessible via a public *Internet Protocol (IP) network*, such as the Internet, or a private local area network (LAN), by referencing a uniform resource locator (URL) that identifies the site.

Tim Berners-Lee while working at **CERN** created the first website in *August 1991*. The website was initially created to help CERN physicists share information and collaborate on research. The website consisted of a single page with a few links to other websites.

In 1993, *CERN* made the website available to the general public and the first website outside of CERN was created. The website was created by a group of European scientists to share information about the *World Wide Web*. The website was called the *World Wide Web Virtual Library* and was the first directory of websites.

Famous Websites:

- In 1994, the first web browser was created by *Marc Andreessen*.
- The browser, ***Mosaic***, was later renamed *Netscape Navigator*. *Netscape Navigator* was the first web browser to allow users to view images and text on the same page.
- In 1995, the first online auction site, ***eBay***, was created. *eBay* allowed users to auction off items to the highest bidder.
- In 1996, the first search engine, ***AltaVista***, was created. AltaVista allowed users to search for websites by keyword.
- In 1997, the first online bank, ***First Virtual Holdings***, was created. First Virtual Holdings allowed users to conduct transactions and manage their accounts online.
- In 1998, ***Google*** was founded by Larry Page and Sergey Brin.
- Google is a search engine that uses algorithms to rank websites.
- In 1999, the first online music store***, MP3.com***, was created. MP3.com allowed users to purchase and download music files.
- In 2000, the first online pet store***, Pets.com***, was created. Pets.com allowed users to purchase pet supplies and products online.
- In 2001, the first online travel agency, ***Expedia***, was created. Expedia allowed users to book travel reservations online.

- In 2002, the first online dating site***, eHarmony***, was created. eHarmony allowed users to find potential partners based on compatibility.
- In 2003, the first online blog***, Blogger***, was created. Blogger allowed users to create and share blog posts.
- In 2004, the first online video sharing site***, YouTube***, was created. YouTube allowed users to upload, view, and share videos.
- In 2005, the first online social networking site***, Facebook***, was created. Facebook allowed users to connect with friends and share information.
- In 2006, the first online microblogging site***, Twitter***, was created. Twitter allowed users to share short updates with friends.
- In 2007, the first online video streaming site, ***Netflix***, was created. Netflix allowed users to watch movies and TV shows online.
- In 2008, the first online food delivery service, ***Seamless,*** was created. Seamless allowed users to order food from restaurants online.
- In 2009, the first online crowdsourcing platform, ***Kickstarter***, was created. Kickstarter allowed users to fund projects by making pledges.
- In 2010, the first online group buying site, ***Groupon***, was created. Groupon allowed users to get discounts on products and services.
- In 2011, the first online marketplace for handmade goods, ***Etsy***, was created. Etsy allowed users to buy and sell handmade goods.
- In 2012, the first online car sharing service***, Zipcar***, was created. Zipcar allowed users to rent cars by the hour or day.
- In 2013, the first online home sharing service, ***Airbnb***, was created. Airbnb allowed users to rent out rooms or entire homes.
- In 2014, the first online storage service, ***Dropbox***, was created. Dropbox allowed users to store files online and share them with others.
- In 2015, the first online course platform, ***Udemy***, was created. *Udemy* allowed users to take courses online.
- In 2016, the first online home automation service, ***Nest***, was created. Nest allowed users to control their homes remotely.
- In 2017, the first online food delivery service, ***Uber Eats***, was created. Uber Eats allowed users to order food from restaurants and have it delivered to their homes.
- In 2018, the first online scooter rental service***, Bird***, was created. Bird allowed users to rent scooters by the minute.
- In 2019, the first online home buying service, ***Opendoor***, was created. Opendoor allowed users to buy and sell homes online

History of Web-browser

A *web browser* is a software program that allows a user to access, view, and navigate the internet and the World Wide Web. The first web browser was created in 1990 by Tim Berners-Lee. Today, there are many different web browsers available, such as *Google Chrome, Mozilla Firefox, Microsoft Edge, and Safari.*

Internet Explorer

Internet Explorer is a series of graphical web browsers developed by Microsoft and included as part of the Microsoft Windows line of operating systems, starting in 1995. It was first released as part of the add-on package Plus! for Windows 95 that year. Later versions were available as free downloads, or in service packs, and included in the original equipment manufacturer service releases of *Windows 95* and later versions of Windows. Internet Explorer was one of the most widely used web browsers, attaining a peak of about 95% usage share by 2003. This came after Microsoft used bundling to win the first browser war against Netscape, which fell from 90% to under 40% by 2002.

- **Number of people using IE:** 28 million worldwide
- **12-month growth:** 1.28% to 0.61% (2020-2021)
- **10-year growth:** 39.47% to 0.61% (2011-2021)
- **Highest market share:** 94.04% in 2004
- **Growth trend:** Increased until 2004, then a consistent decline in market share

Google

Google has a long and storied history, dating all the way back to 1996 when it was founded by *Sergey Brin* and *Larry Page*. Since then, Google has become the world's largest and most popular search engine, handling over 3 billion searches per day. In addition to search, *Google also offers a wide variety of other products and services, including Gmail, YouTube, and Google Maps.*

- **Number of people using Chrome:** 3.04 billion worldwide
- **12-month growth:** 65.89% to 65.27% (2020-2021)
- **10-year growth:** 20.59% to 65.27% (2011-2021)
- **Highest market share:** 66.34%
- **Growth trend:** Since 2008, it's only increased year-over-year

Microsoft Edge

Microsoft Edge is a web browser developed by Microsoft. It was first released for Windows 10 and Xbox One in July 2015, and later for Android and iOS in November 2015. Microsoft Edge is the successor to *Internet Explorer*, and is designed to be a lightweight web browser with a minimalistic user interface.

- **Number of people using Edge:** 158 million worldwide
- **12-month growth:** 2.14% to 3.4% (2020-2021)
- **Growth since launch:** 00.3% to 3.4% (2015-2021)
- **Highest market share:** 3.4% (right now)
- **Growth trend:** It's only increased year-over-year

Mozilla Firefox

Mozilla Firefox is a free and open-source web browser developed by the Mozilla Foundation and its subsidiary, the Mozilla Corporation. Firefox is available for Windows, macOS, Linux, and Android. Its default browser engine is Gecko.

Firefox was created in 2002, under the name "*Phoenix*", by the Mozilla community members who desired a standalone browser, rather than the Mozilla Application Suite bundle. During its beta phase, Firefox proved to be popular with its testers and was praised for its speed, security, and add-ons compared to Microsoft's then-dominant *Internet Explorer 6*. Firefox was released on November 9, 2004, and challenged Internet Explorer's dominance with 60 million downloads within nine months.

- **Number of people using Firefox:** 153 million worldwide
- **12-month growth:** 4.26% to 3.29% (2021-2021)
- **10-year growth:** 25.99% to 3.29% (2011-2021)
- **Highest market share:** 31.56% in 2009
- **Growth trend:** Increasing until 2009, then a consistent decline in market share

Opera

Opera is a web browser developed by Opera Software. It is a freeware web browser. The browser handles common Internet-related tasks such as displaying web sites, sending and receiving e-mail messages, managing contacts, chatting on IRC, downloading files via BitTorrent, and reading web feeds. Opera is offered free of charge for personal computers and mobile phones.

- **Net Worth**: $0.47B.

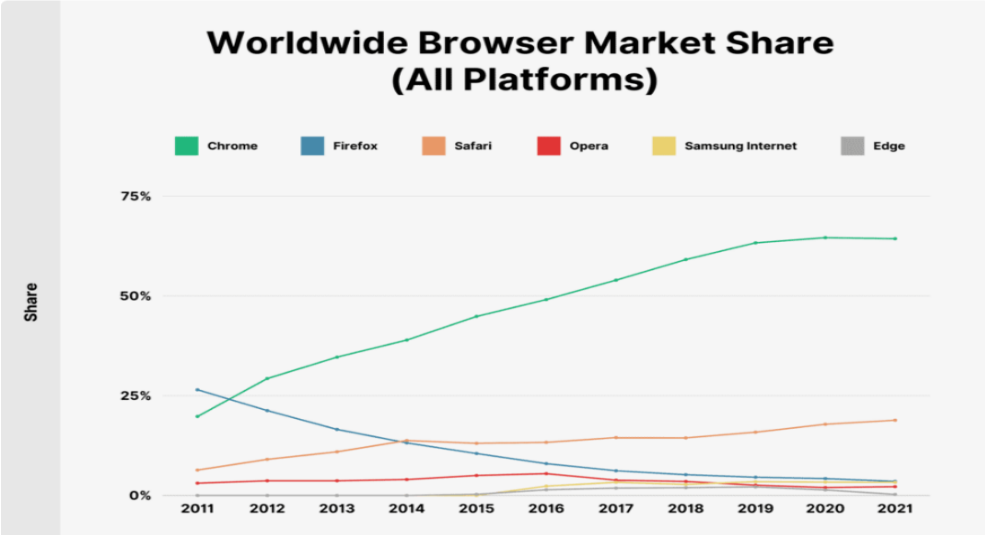

Figure 3. Market Shares of Web Browsers

APPLICATIONS

History of Web Applications:

Web applications have come a long way since their humble beginnings. Early web applications were little more than simple text pages that could be viewed in a web browser. These early applications were not very interactive or user-friendly. As the web evolved, so did web applications. Early web applications were replaced by more sophisticated applications that could provide a more user-friendly experience. These newer applications were able to make use of more advanced technologies such as cascading style sheets *(CSS)* and *JavaScript* to provide a more rich and interactive experience for users. Today, web applications are more powerful and user-friendly than ever before. With the advent of *HTML5* and *CSS3*, web applications can now provide a truly native experience that is on par with native desktop or mobile applications.

- The first ***web application*** was created in *1990* by Tim Berners-Lee. It was a simple application that allowed users to view and edit hypertext documents.
- The first web browser***, Mosaic***, was released in 1993 and quickly became the most popular way to view web pages. *Mosaic* was followed by a number of other browsers, including Netscape Navigator and Microsoft Internet Explorer.
- In *1995*, ***JavaScript*** was introduced, which allowed web pages to be more interactive.
- In the same year, the first web-based email service, **Hotmail,** was launched.
- In *1996*, the first web-based search engine***, Excite***, was launched.
- In the following years, a number of other search engines, including ***Google,*** were launched. In *1998*, the first web-based chat service, IRC, was launched.
- In the early 2000s, a number of web-based social networking sites, including ***Friendster*** and ***MySpace***, were launched.

Process of Creation of a Web Application:

The process of creating a web application can be divided into four main steps:

- ***Planning:*** In this step, you will need to determine the purpose of your web application and what functionality it will need to have. You will also need to decide on the technologies you will use to build it.
- ***Design:*** In the design phase, you will create the overall look and feel of your web application. This includes deciding on the layout, colors, and fonts.
- ***Development:*** This is the phase where you will actually build the web application. This includes coding the functionality, as well as creating any necessary database tables and front-end templates.
- ***Testing and Launch:*** Before you launch your web application to the public, it is important to test it thoroughly. This includes testing for bugs and ensuring that all the functionality works as expected.

Mobile Applications:

A ***mobile application***, also known as a mobile app or simply an app, is a computer program or software application designed to run on a mobile device such as a phone, tablet, or watch. Apps were originally intended for productivity assistance such as *email, calendar*, and *contact databases*, but the public demand for apps caused rapid expansion into other areas such as mobile games, factory automation, GPS and location-based services, order tracking, and ticket purchases.

The term "***app***" has become a popular buzzword; in 2010, the American Dialect Society named it Word of the Year. In 2009, technology columnist David Pogue said that newer smartphones could be nicknamed "*app phones*" to distinguish them from earlier less-sophisticated smartphones. App developers can create applications that run on the major operating systems, including Android, iOS, Linux, macOS, and Windows. They can also be written in a web-based language such as HTML5 and JavaScript.

- The first generation of *mobile applications* were made for basic gaming and productivity tasks.
- The second generation improved upon this by adding more features and functionality.
- The third generation, which is the current generation, has seen a dramatic increase in the number and variety of apps available. This has been made possible by the increased processing power and storage capacity of modern smartphones.

SOCIAL MEDIA APPS

Social media has been a game changer when it comes to the way we communicate and share information. In the past, information was shared through word of mouth or through print media, which was often biased or censored. Social media has given us a platform to share information quickly and easily, and has made it possible for us to connect with people all over the world. The history of social media is relatively short, but it has already had a major impact on the way we communicate and interact with each other. It is important to remember that social media is still evolving, and that its impact will continue to change as it grows.

There are many famous social media platforms. Some popular ones include Facebook, Twitter, Instagram, and Snapchat. These platforms allow people to connect with friends, family, and others who have similar interests. They also provide a way for people to share information and experiences.

- ***Twitter*** is a social networking site that allows users to post short updates, or "*tweets*," of up to 140 characters. Twitter was founded in 2006 by Jack Dorsey and has since become one of the most popular social networking sites on the web.
- ***Instagram*** is a free online photo sharing and social networking service that enables users to share pictures and videos with friends and followers. It was created by Kevin Systrom and Mike Krieger, and launched in October 2010. Since its launch, Instagram has become one of the most popular social networking platforms, with over one billion monthly active users.
- ***Facebook*** is a social networking service that was launched on February 4, 2004. It was founded by Mark Zuckerberg with his college roommates and fellow Harvard University students Eduardo Saverin, Andrew McCollum, Dustin Moskovitz, and Chris Hughes. The website's membership was

initially limited by the founders to Harvard students, but was expanded to other colleges in the Boston area, the Ivy League, and Stanford University. It gradually added support for students at various other universities before it opened to high school students, and finally to anyone over the age of 13.

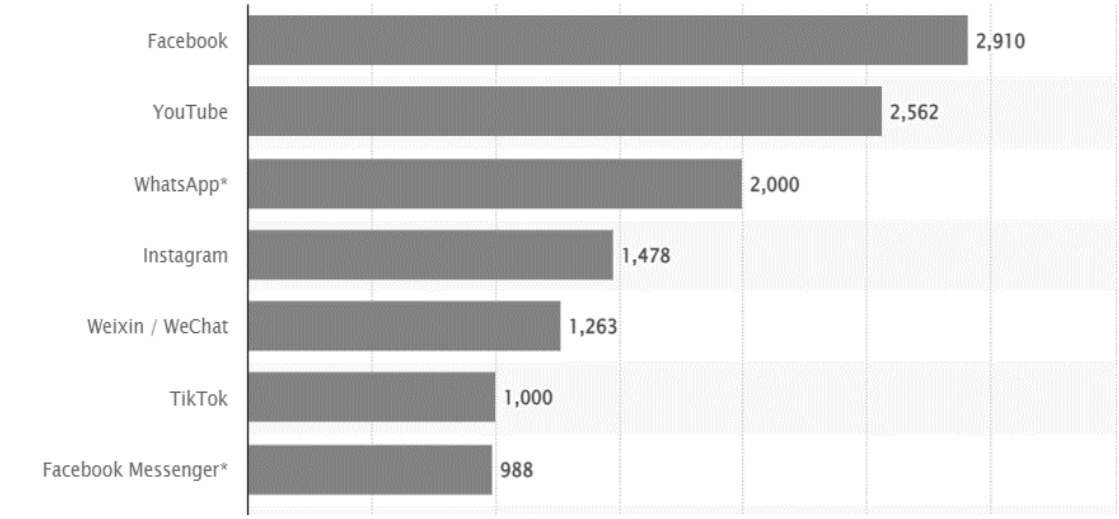

Figure 4 Most popular social networks worldwide as of January 2022 ranked by active number of users in millions

M-COMMERCE

Definition:

Short for mobile commerce, m-commerce refers to any commercial transactions that take place via apps or mobile sites. Mobile commerce can be understood broadly as a subcategory of e-commerce, or as the mobile version of e-commerce. The mobile commerce vertical is growing rapidly, with the percentage and share of digital purchases that are taking place on mobile increasing each year. As making purchases on mobile gets more convenient and as more people globally gain access to smartphones and tablets, the capacity for mobile purchases to be made continues to soar.

In short, the definition of m-commerce is the buying and selling of items via mobile devices.

What is the difference between m-commerce and e-commerce?

Electronic commerce includes all commercial transactions that take place digitally, and mobile commerce is strictly mobile (or tablet), dealing with digital transactions that take place on smartphones. Although m-commerce is a subcategory of e-commerce, the latter typically refers

to transactions that take place on desktop computers. So, if you browse a clothing website on a desktop and make a purchase, that's an e-commerce transaction, if you access a clothing brand or retailer via an app or mobile site, that's a mobile commerce transaction. What m-commerce essentially enables is the ability for users to access online shopping platforms, browse and make purchases as conveniently and seamlessly as possible using a mobile device.

M-commerce Types

Broken into three main categories (mobile shopping, mobile payments, and mobile banking), the highest growth areas for m-commerce are:

- In-app purchasing (such as buying clothing items via a retail app)
- Mobile banking
- Virtual marketplace apps like Amazon
- Digital wallets like Apple Pay, Android Pay, and Samsung Pay
- Mobile ticketing

There is significant crossover with fintech, but that is only because mobile commerce does not strictly refer to the buying of products, it also encapsulates the smartphone behaviors that lead to making a mobile purchase and the technology that enables it.

Key M-Commerce Areas :

- ***Browsing and buying:*** Similar to an e-commerce flow on a desktop, this form of m-commerce involves the user browsing apps, clicking around mobile websites, and making purchases. This typically occurs via dedicated apps, but can also take place as a 'social commerce' purchase, with social media platforms including TikTok, Instagram and Snapchat offering purchasing options in-app.
- ***Convenience purchases:*** Many of the purchases that take place on mobile aren't retail-related, and m-commerce is not restricted to 'shopping' per se. These purchases include ordering food or grocery deliveries, and booking taxis or ride sharing.

- ***Mobile app payments and wallet payments***: There are various ways to actually make an m-commerce purchase, and digital wallets are growing in use. Instead of inputting credit card details to each individual app, a user's digital wallet can be loaded (as a popup/overlay) and the purchase can be made with a single click or by simply using a thumbprint.

- ***Digital content (purchasing and renting)***: Subscriptions apps are extremely popular on mobile, most commonly with music and video (think Netflix and Spotify). Users pay a subscription fee and can then access an entire library of content from their mobile app.

Growth of mobile commerce

As mobile ownership rates continue to rise globally, alongside access to high-speed internet, m-commerce is set to continue taking market share within the e-commerce sector. If we think about the fact that more internet usage currently comes from mobile than from desktop, a clear picture of the future of online/digital commerce can be understood. Businesses that do not take advantage of this shift to m-commerce will limit their reach as the shift to mobile continues.

Famous Applications:

Amazon: Amazon.com is a vast Internet-based enterprise that sells books, music, movies, housewares, electronics, toys, and many other goods, either directly or as the intermediary between other retailers and Amazon.com's millions of customers

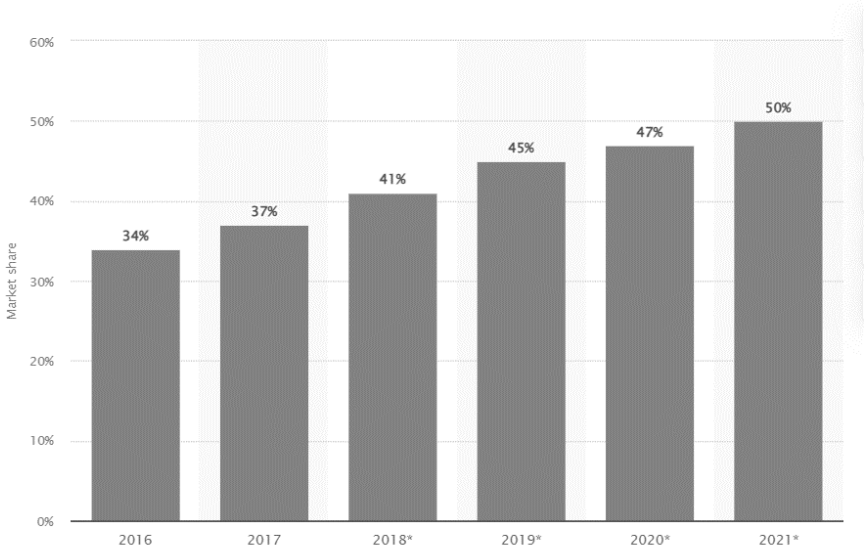

Figure 5 U.S Amazon retail e-commerce GMV share 2016-2021

Table 1

Share Price, 52-Week Range	$101.26-$188.11
Fiscal Year 2021 Revenue	$469.82B
Fiscal Year 2021 Profit	$33.364B
GOBankingRates' Evaluation of Amazon's Net Worth	$438.118B
52-week-range data is accurate as of Aug. 1, 2022.	

EBay*:*

EBay was one of the first companies to create and market an Internet Web site to match buyers and sellers of goods and services. The company, which caters to individual sellers and small businesses, is a market leader in e-commerce worldwide. EBay is headquartered in San Jose, California.

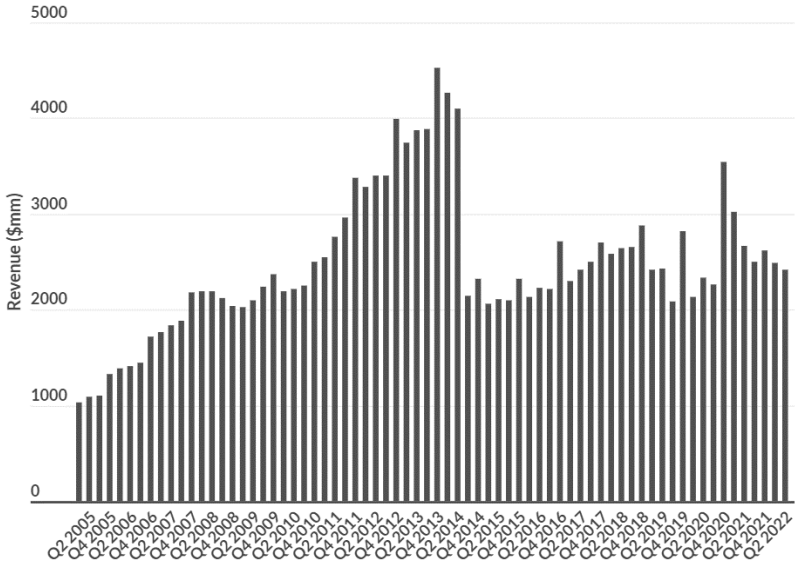

Figure 6 Ebay Quarterly Revenue 2005 to 2005 ($mm)

Target:

Target Corporation is one of the largest discount retailers in the United States and the world based on sales. The company operates a chain of stores that offer a wide variety of general merchandise and food to their customers. The company operates primarily in the United States, as it has done since its inception. Target did have several stores in operation in the Canadian market, but these were all closed in 2015. At the end of the financial year 2021, Target operated more than 1,900 stores across the United States.

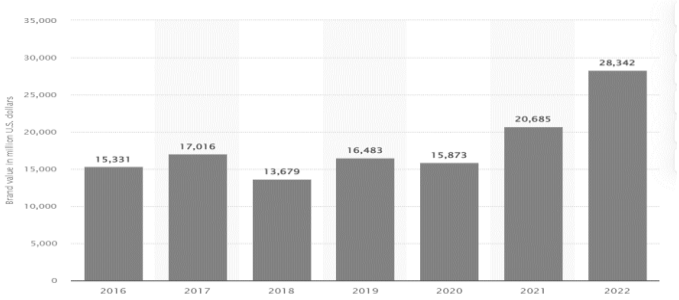

Figure 7 Target's Brand value worldwide from 2016-2021 (in millions U.S Dollars)

Overstock:

Overstock.com, Inc. is an online retailer that sells excess inventory at discounted prices. The company, akin to an outlet store that sell s the closeout merchandise of manufacturers, distributors, and other retailers, offers brand name bed-and-bath goods, home decor, furniture, kitchenware, watches, jewelry, computers and electronics, sporting goods, and apparel. Overstock.com also sells books, magazines, CDs, DVDs, videocassettes, and video games, items that are classified as "BMV" products. The company sells approximately 500,000 BMV products and 50,000 non-BMV products

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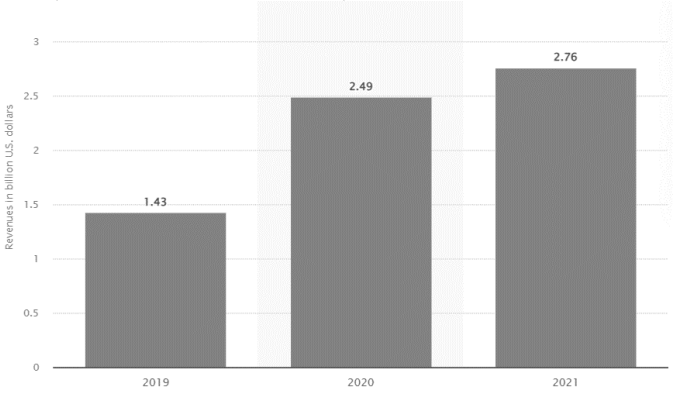
Figure 8 Annual net revenue of Overstock from 2019 to 2021 (in billion in U.S dollars)



Alibaba:

Alibaba is a Chinese e-commerce platform that enables businesses and consumers to buy and sell products and services online. The company operates in two segments: Taobao Marketplace and Tmall. Alibaba also provides online payment services, shopping search engine, and data-centric cloud computing services. The company was founded in 1999 and is headquartered in Hangzhou, China.

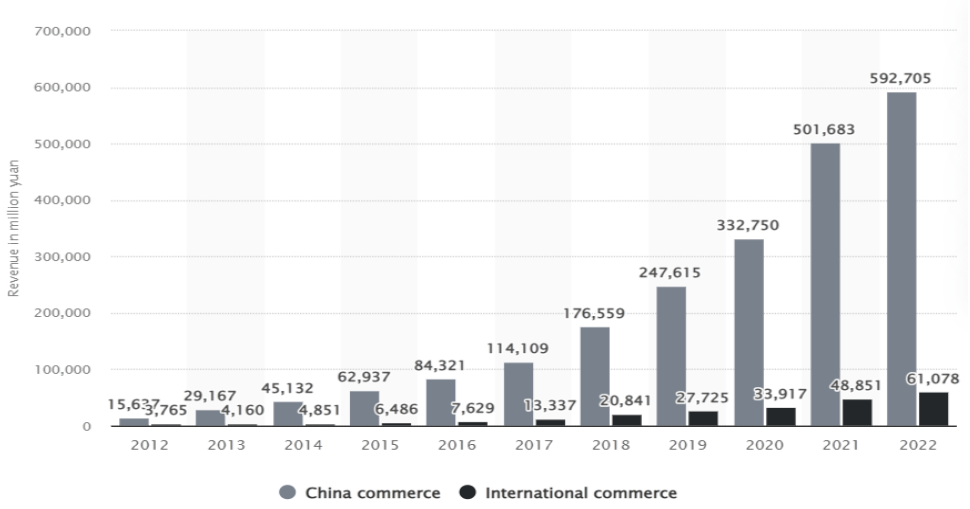


Figure 9 Annual e-commerce revenue of Alibaba from financial year 2012 to 2022 (in million yuan)

MY BUSINESS IDEA

The industry I find most fascinating is the computer software industry. This industry is growing at an incredible rate and is expected to continue to grow in the coming years. This provides a lot of opportunity for those who are interested in this field. There are many different areas within the software industry, so there is sure to be something that interests everyone.

Mobile applications are one area that I find particularly interesting. They are becoming more and more popular as people realize how convenient and user-friendly they can be. There is still a lot of room for innovation in this area, so I believe it has great potential.

In the current economy, many entrepreneurs are looking for new business opportunities. One of the most promising sectors is the IT industry. A new business in this sector could be selling online vintage products. A website and mobile app could be setup that displays all the products that are available and the customers can easily buy the products they like by a simple click instead of going through the gruesome process of actually going to these markets and looking for products in good condition endlessly. This would be a great opportunity because there is a growing market for vintage items and the internet provides a great platform for selling these items.

There is an economic downturn in Pakistan as a result lowering the purchasing power of customers. But people actually don't like going to these stores in Pakistan because they are very crowded. An online platform for selling such products would be a perfect place to start.

There is an economic concept known as a ***positional good*** in which the possessor only values an object because others do not possess it. Economist Fred Hirsch coined the term in 1976.

Inspiration:

- For as long as I can remember, I have loved vintage products. There is something about the history and uniqueness of each piece that really speaks to me. Whether it is a beautiful antique dress or a simple piece of jewelry, I just cannot resist.

- I think part of my love for vintage comes from my own personal style. I tend to gravitate towards clothes and accessories with a bit of an old-fashioned feel. Moreover, even though I am not usually one for trends, there's something about vintage fashion that always seems to be in style.

- Beyond simply being attracted to the aesthetic of vintage items, I also appreciate the quality and craftsmanship that often goes into them. In today's world of mass-produced goods, it is refreshing to know that there are still people out there creating beautiful things by hand using traditional methods.

- The idea of finding a piece that is truly one-of-a-kind and has a *history* behind it is very appealing to me. I also love the challenge of finding these treasures, as it feels like I am on a never-ending *treasure hunt*. I know that there are more of me out there, and so I want to create an online vintage shop that would be perfect for them.

- There are already many online vintage shops, but most of them sell products that are in poor condition or overpriced. My shop would be different in that all of the products would be carefully selected and only those in excellent condition would be sold. This would ensure that customers are getting their money's worth and also increase the chances of them coming back for more purchases.

- In order to make my shop successful, I need to do some research on what types of products are popular among Vintage lovers and also figure out where I can source these items at reasonable prices. Once my business is up and running, I am confident that it will be a success due to the uniqueness of my concept and the quality of my products

- I have always loved finding unique and one-of-a-kind items, particularly when it comes to vintage pieces. I remember scouring through my local antique shops and flea markets with my mom as a kid, and I would get so excited whenever I found something special. Even now as an adult, the thrill of the hunt still has not gone away. That is why I am passionate about developing an online vintage shop that sells quality products in good condition.

- In foreign countries, people even celebrities are not reluctant to buy vintage products and it has become a huge business. I observed that are actually no online stores in Pakistan that sells these products in good condition and I want to change that. There is a gap in market that I would like to fill b opening online vintage shop. There is little to no doubt that this could be achieve success in Pakistan like it did in other countries.

- There is definitely a market for this type of business, as more and more people are becoming interested in buying vintage items. Not only are they often cheaper than their modern counterparts are, but they also have a certain charm and character that cannot be replicated.

- In addition, by shopping secondhand we can help reduce our environmental impact by reusing goods instead of buying new ones (which require energy and resources to produce).Not only will I get to source amazing products from all over the world, but I will also get to share your passion with others who appreciate unique finds just as much as I do.

- The popularity of online vintage stores is on the rise as people are becoming more interested in sustainable and unique fashion. As an entrepreneur, I think this is a great opportunity to start my business and reach a wider audience.

Next section of this business idea will focus on all the products that I would like to include in my online shops and why the customers would like buying them.

My business idea is to start an online vintage store that sells products from all over the world. I would sell items such as

- *Clothing*
- *Musical Instruments*
- *Crockery*
- *Toys*
- *Comic Books*
- *Antiques*
- *Art Pieces*
- *Shoes*
- *Bags*
- *Books*
- *Jewelry*
- *Furniture*
- *Accessories*
- *Musical Records*
- *Cd's/Dvd's*

I would import cultural souvenirs from different countries as well as vintage items. I think this type of store would be very successful because it caters to a wide range of people who are interested in different cultures and history.

Vintage Shops are similar to vintage clothing stores except that they don't sell only clothing items. They also sell things like books, records, antiques, collectibles, and art.

Online Vintage Shops are websites where you can buy and sell vintage items. You can browse through their inventory and choose what you want to buy. Then, once you pay for it, you can ship it. However, there are huge companies like EBay do not do business in Pakistan, hence, leaving a gap in the market.

CLOTHING

Vintage clothing **stores** have been around since the early 1900's. These stores were originally set up to sell old clothes, bags and shoes at low prices to people who could not afford them. Today, these stores still exist and they are now called vintage clothing stores. You can find anything from dresses to shoes, even handbags. There are many different types of vintage clothing stores, including thrift stores, consignment shops, flea markets, antique malls, and yard sales.

In order to combat the lack of foot traffic to markets, I would like to provide an online store for buying these products.This is especially true for vintage items, as online buyers are more likely to be satisfied with a purchase than those who visit a traditional market. Individuals do not generally enjoy visiting marketplaces, so an online vintage platform would be a huge success.

GAMES AND TOYS

Toys and board games

I remember going to a market that sold old ***toys*** imported from foreign countries. All those toys were unique, of high quality and I loved the fact that I was the possessor of a unique item. My favorite was a kitchen set, it had all the little utensils, pots and a stove. It was the most precious thing at that time. Such markets are hard to find these days, as globalization has led to the rise of chain stores and mass-produced item. I love the feeling of *exclusivity* that comes with owning something unique. It is a feeling that can be hard to come by in today's society. With mass produced products, anyone can have them, and in no time, they become common. Therefore, to possess an item that only I have is wonderful to me. However, that shop was far away and we had to spend a lot of money on petrol to go there. I want to create a platform that sells high-quality vintage toys online so that parents can easily order toys for their kids without having to go to such good toy stores far away.

Famous Vintage Toys

- Dolls
- Action Figures
- Toy Soldiers
- Dinky Cars
- Doll Houses
- Train Sets
- Zoo Sets//
- Chess
- Ludo
- Monopoly
- Carom Board//
- Playing Cards
- Stuff Toys

Arcade Games:

There is something incredibly nostalgic and exciting about playing classic *arcade games*. Whether you are a seasoned gamer or just getting into the hobby, there is no doubt that vintage games are a must-have for any collection.

Arcade games have a special power to transport you back in time. The bright, colorful graphics, the catchy music, and the excitement of trying to beat your friends all come together to create an experience that is hard to replicate anywhere else.

Some of the most popular vintage arcade games include *Asteroids, Centipede*, and *Donkey Kong*.

My uncle loved playing *Donkey Kong* as a kid in an arcade near his house but as time passed he forgot about it until I mentioned it to him a couple of weeks ago and the look on his face was priceless. He told me about all the times he and his friends played that game and he would do anything to own one as these games as would be a constant reminder of the fond memories of his childhood.

Vintage Video Games

Vintage video games are those that were released at least 10 years ago. They are often considered classics and are sought after by collectors. Many people enjoy playing vintage games because they offer a unique challenge and are a nostalgic trip down memory lane.

- Super Mario Bros
- The Legend of Zelda
- Street Fighter II Turbo
- Nintendo Switch
- Sonic the Hedgehog
- Outrun.
- Super Mario Kart
- Donkey Kong

BOOKS

Comic Books

Crawling through attic and garage sales is not just a hobby, it is a lifestyle. The hunt for rare comics spurs adrenaline around the world without fail. Spend time caffeinating with fellow fans and passionate collectors.

I have a friend who are a lot into reading comics and has a gigantic collection but her only complaint is that there are no *good comic book* stores that sells vintage comic books and she have to spend a lot of money in importing it from foreign countries.

I would like to set up an online store that provide vintage comic books so that they have a trustworthy local vintage store in range.

Early Edition of Books:

The beauty of old books is undeniable. The craftsmanship and dedication that went into binding and designing these tomes is simply amazing. The colors, the textures, the illustrations, they are all so captivating. There is something about flipping through an old book that transports you to another time and place. Whether you are looking for a love story, a history lesson, or just a good read, vintage books are a great way to experience the world in a different way. There is something incredibly special and unique about owning a first edition book. Not only are they rare and valuable, but they often come with a story or history of their own.

My sister and my aunt love to read and they both are huge collectors. However, they are always talking about that it is impossible to locate early edition of good books. I want to create a platform where you don't have to go somewhere to find these books instead by doing a simple search you can see that whether we have early edition of your favorite book available or not.

KITCHEN SUPPLIES

Crokery:

Nostalgia is a powerful marketing strategy when it comes to replicating a vintage taste.
Crockery is one of the most grossly underrepresented categories out there. Whether it be for new mommies, dining rooms, or a kitchen in need of a flair, crockery is the way to spice it up. I hope my line includes vintage sterling silver coasters and trays, silk dinner napkins for mother of the bride and groom, high-quality ceramic flourmills and tea sets, even elegant pasta pots to adorn your dinner table.
Vintage crockery curates chic and beautifully aged crockery perfect for exquisite table settings, restaurants, and catering.

Silverware:

Vintage Silverware is a great way to display your vintage antique silverware collection. If you have many pieces, then you should consider purchasing a small cabinet to store them in. You can use these cabinets to hold your dishes, cups, bowls, and other kitchen utensils.

My grandmother lived in Iran for almost a decade but she had to comeback because of Iranian revolution. When she came back, she brought some copper utensils with her. After keeping it for almost 40 years and when she sold it and made a fortune as these antique utensils were not only well-preserved but eating food cooked in copper pots is also beneficial for health. These type of products have high market demand and huge profit can made.

Famous Vintage Kitchen Products

- Tea Caddies
- Sugar Boxes
- Tea Spoons
- Teapots
- Silver Tea Sets
- Swansea cup and saucer
- Dutch Delft Bowl
- English Plates
- Silver Spoons
- Cutlery Boxes
- Knife Trays
- Gravy Boats

- Serving Dishes
- Picnic Sets
- Dessert Service Sets
- Salt and Pepper Shakers

FURNITURE

Beautifully aged furniture can add so much *ambiance* to any room. These vintage wonders are in demand and only a matter of time before they are all taken .Ever wish you had furniture from the 1950s or '60s.

My *grandmother* got an armoire in her dowry and even after 6 decades she still has it because that particular piece of furniture add a maturity to the dining room.

A maturity is something that adds beauty and value to a space. In this case, the maturity is the armoire. Even though it is old, it still looks good and adds a lot of character to the room. A unique piece of furniture adds a maturity to any space. It makes it look classy and gives it a sense of style.

Buying a unique piece of furniture is *cheaper* than buying a regular one. You do not have to worry about the price tag. You can easily afford it. Buying a unique piece of furnishing is a great idea. You will enjoy spending time in your home and you will save money too.

At my store, you will buy unusual and hard-to-find vintage furniture. Where you can just select the furnishing, what you like and it will delivered to you.

Famous Vintage Furniture

- Art Deco Dressing Table
- Bachelor's Chest
- Victorian Chair
- Berge're Chair
- Bombe'
- Bonheur-Du-Jour
- French Side Cabinets
- Breakfront Bookcase
- Regency dressing Tables
- Arm Chair
- Bureau Bookcase
- House Desk
- Small Chaise Longue
- Chest-On-Chest

- Chess Table
- Chinese Dressing Tables
- Bedside Cupboard
- Hexagonal Tripod Table
- Mid Victorian Cradle
- Irish Oak Dressing Table
- Duet Table
- Dumb Waiters
- Harlequin Games Table
- Knee- Hole Desk
- Three Pedestal Dining Table
- Gothic-Style Armchair
- Harlequin Pembroke Table
- Inlaid Oak Table
- Inlaid rosewood Cabinet
- Indian Export Table
- Inlaid Longcase Clock
- Domestic Medicine Chest
- Dressing Screens

MUSIC AND FILMS

Musical Instruments:

Old musical instruments have always fascinated antiques and vintage collectors. Such as flute, piano, violin , harmonium and trumpet

One my cousin in Canada got a piano from a vintage shop. He is obsessed with it for two reasons

1. It is one-of-a-kind
2. It is in really good condition.

Vinyl records

Vinyl records are back! They have been around for decades and i think we should bring them back. Vinyl records are great because they are durable, portable, and affordable. They are also eco-friendly.

Cassettes

Cassettes are awesome because they are cheap, durable, and reusable. They are also portable and compact. Cassettes are perfect to listen to at work, school, or any place where you need to save space.

8 Track Tapes

I love these because they are inexpensive, portable, and last forever. They are cool to play at parties and events because of their big sound. they are also good for people who like to collect old stuff and 8 track tapes fit perfectly in a box full of old things.

Mp3 Players

Mp3 players are awesome because they are small, portable, and can hold thousands of songs. Some models even have a headphone jack so you do not have to share earbuds.

DVD'S

DVD's are awesome because they are portable and can hold tons of movies. USB and hard drives are usually corrupted and data in these flash drives is never safe.

My dad had a huge collection of dvd's and loved cinema and I inherited this passion from him but now a days I cannot find dvd's of good movies. If you have a passion for collecting hardcopies of movies like I do, my online store would be a perfect place for you where you would be able to find all the old movies in DVD's.

JEWELRY AND ACCESSORIES

Vintage Jewelry:

Vintage jewelry is all the rage right now. There are so many different styles and colors to choose from, and it is easy to find something that you will love. One of the things that makes vintage jewelry so special is the fact that it is often unique and unique pieces are always in demand. Whether you are looking for something special for yourself or you want to give a loved one a unique gift, vintage jewelry is definitely the way to go.

Jewelry is a great way to show off your vintage antique jewelry collection. You can hang your jewelry on a wall or display it in a glass case..

ART PIECES

Art Pieces:

Vintage art pieces are those that were created at least 20 years ago. They may be from any era or style. I *love art* pieces but what stopped me for pursuing this hobby is that art pieces in Pakistan here are whether extremely overpriced or mass-produced.

Famous Decoration Pieces

- Candle Holders
- Paintings
- Figurines

- Table centerpieces
- Flowerpots
- Vases
- Ashtrays
- Hand mirrors

Conclusion

To sum up, my business would cover all the products that we use in our daily life. As there is inflation in Pakistan, I think people can shift their spending methods. This way not only, they will have products that are relatively cheap but are also durable. I believe as we are moving forward there are somethings from the past that are worth saving. The items that they possess will be unique and one-of-a-kind. All their favorite vintage products will be synthesized into an one accessible website. In addition, the customer base will be aging, individuals that want to reminisce about the nostalgia but there is also potential for younger generations to also get involved as well, because there is an on going trend among youngsters to collect vintage items who express interest in vintage products and indulge in a more refined aesthetic. This is just a blueprint for a much wider concept. Although, I have many plans for my business like selling vintage cars and old technology like typewriter, Polaroid cameras and much more!

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