

History and development of Computing Assessment 1 the report

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Assignment 1 (The report)

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Skills for Academic Success

**University of Wales Trinity Saint
David**

- **Introduction: Definition of Computing**
- **The early beginnings**
- **The appearance of Electronic Computers**
- **Development and Computer Revolution**
- **Innovations**
- **Modern Computing and the Internet**
- **Conclusion**
- **References**

8 2 Brief History of Computing

7 What is the definition of computing?

Computing is the process of using computer technology to complete a given goal-oriented task and serves as the backbone  3 modern technology, encompassing a vast array of processes and applications aimed at achieving specific objectives. At its core, computing involves employing computer technology to accomplish goal-oriented tasks efficiently and effectively. This multifaceted discipline spans the design, development, and implementation of both software and hardware systems tailored to diverse purposes and industries. The scope of computing is expansive, covering a spectrum of activities that revolve around structuring, processing, and managing information to facilitate various endeavours. From scientific research to entertainment and communication, computing plays a pivotal role in shaping the way we interact with technology and navigate the digital landscape. One of the primary functions of computing is to aid in the pursuit of scientific studies by providing powerful tools and methodologies for data analysis, simulation, and modelling. Whether it's unravelling the mysteries of the universe, understanding complex biological processes, or predicting weather patterns, computing empowers researchers to make significant strides in their respective fields. Moreover, computing contributes to the development of intelligent systems that can perceive, reason, and learn from data, leading to advancements in artificial intelligence, machine learning, and robotics. These intelligent systems have applications in diverse domains, including autonomous vehicles, medical diagnostics, and virtual assistants, enhancing efficiency and productivity across industries. Furthermore, computing enables the creation and operation of various media for entertainment and communication, enriching human experiences and fostering connectivity on a global scale. From immersive video games and interactive multimedia content to social media platforms and streaming services, computing technologies continue to redefine how we consume and interact with digital content.

In essence, computing serves as a method for innovation, driving progress and shaping the future of technology. By controlling the power of computer technology, individuals and organizations can unlock new possibilities, solve complex problems, and transform ideas into reality, ultimately contributing to the advancement of society.  4

Example of a timeline in Computing:

- 5 1. Second generation 1950s-1960s Transistor based
2. Third generation 1960s-1970s Integrated  5 it based

3. **Fourth generation** 1970s-present **Microprocessor based**
4. **Fifth generation** **The present and the future** **Artificial intelligence based**

A Brief History of Computing

Computing has a long history, starting way back with simple tools like the abacus and evolving to today's fancy gadgets. Big moments include people like Pascal and Leibniz inventing early calculators ages ago. Then, in the 20th century, we saw the birth of electronic computers like ENIAC and Colossus, and later, we got transistors and coding languages. The 1970s and 1980s were a gamechanger with the arrival of personal computers like the IBM PC and Apple Macintosh, totally revolutionising how we do things. [2]

The early beginnings

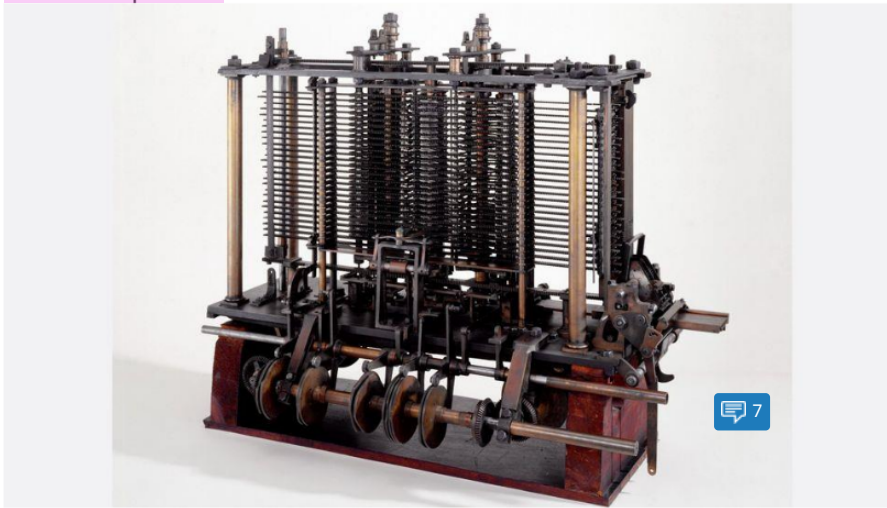
6 The history of computers began with primitive designs in the early 19th century and went on to change the world during the 20th century.

The journey of computers stretches back more than two centuries. Initially, it was all ideas swirling in the minds of mathematicians and business-minded people. Then, in the 1800s, came the birth of mechanical calculators. These gadgets were like the super brains of their time, designed to tackle the tricky math problems popping up everywhere.

Below are a few examples of the author Timothy Williamson (qualified computer science engineer) research.

- 2 • 1801: Joseph Marie Jacquard, a French merchant and inventor invents a loom that uses punched wooden cards to automatically weave fabric designs. Early computers would use similar punch cards.

- **1821:** English mathematician Charles Babbage conceives of a steam-driven calculating machine that would be able to compute tables of numbers. Funded by the British government, the project, called the "Difference Engine" fails due to the lack of technology at the time, according to the [University of Minnesota](#).
- **1848:** Ada Lovelace, an English mathematician and the daughter of poet Lord Byron, writes the world's first computer program. According to Anna Siffert, a professor of theoretical mathematics at the University of Münster in Germany, Lovelace writes the first program while translating a paper on Babbage's Analytical Engine from French into English. "She also provides her own comments on the text. Her annotations, simply called "notes," turn out to be three times as long as the actual transcript," Siffert wrote in an article for [The Max Planck Society](#). "Lovelace also adds a step-by-step description for computation of Bernoulli numbers with Babbage's machine — basically an algorithm — which, in effect, makes her the world's first computer programmer." Bernoulli numbers are a sequence of rational numbers often used in computation.



- **1853:** Swedish inventor Per Georg Scheutz and his son Edvard design the world's first printing calculator. The machine is significant for being the first to "compute tabular differences and print the results," according to Uta C. Merzbach's book, "Georg Scheutz and the First Printing Calculator" (Smithsonian Institution Press, 1977).
- [3]

The appearance of Electronic Computers

In 1944, a groundbreaking electronic computer named Colossus sprung to life at Bletchley Park, Britain's top secret codebreaking hub during World War II.

It has been known as being the first Electronic Computer to ever existed.

Using Colossus, the British was intercepting encrypted German messages during the war. There were two main types: Enigma, sent in Morse code, and the lesser known "Fish" transmissions, which used electric teleprinters. The Fish messages were a big deal, especially those from a German machine called "Tunny," code-named by the British. Tunny was like a puzzle box built by Berlin's C. Lorenz AG. It communicated using binary code, which is basically strings of zeros and ones, just like the language computers speak today. [4]

Development and Computer Revolution

Every significant change in computing history can be characterized by the particular technology it brought forth. Here's a breakdown of each major revolution along with the decade it occurred as it states in the article "Computer Revolution" by Nathan Emberton (Computer Scientist)

- ⁴ 1. The advent of the [integrated circuit](#) in the 1960s led to the modern PC, helping businesses and communications companies around the globe.
- ³ 2. In the 1980s, the [personal computer](#) came into being. It allowed home users to increase their education, productivity, and entertainment.
3. In the 1990s, the third revolution started when the [Internet](#) was introduced. This allowed almost every computer in the world to communicate with one another.
4. Modern mobile devices, such as [smartphones](#) and [tablets](#), were invented in the 2000s, adapting the functionality of computers to a smaller, portable [form factor](#).

Innovations

¹ **What is Computing Innovations?**

Computing innovation encompasses **the inception and utilization of fresh concepts, technologies, and methodologies within the computing realm. It involves the formulation of innovative algorithms, software frameworks, hardware structures, and computational strategies aimed at addressing intricate challenges, enhancing productivity, and fostering progress across diverse fields. This continual process of innovation is instrumental in pushing the boundaries of what computing can achieve, facilitating breakthroughs in areas ranging from artificial intelligence and data analytics to cybersecurity and scientific research. By fostering a culture of creativity and experimentation, computing innovation fuels transformative change, driving technological evolution and shaping the future of society.**

Below are several key aspects(as stated by Nick Jain in the article) ¹What is Computing Innovation? Definition, Examples and Best Practices

- ¹ **Technological Advancement:** Computing innovation fuels [technology innovation](#) across multiple industries. It drives the development of more powerful processors, advanced software applications, and cutting-edge hardware systems. Computing innovations have led to significant advancements in areas such as artificial intelligence, data analytics, virtual reality, cloud computing, and cybersecurity.
- **Problem Solving and Optimization:** Computing innovation enables the development of new approaches and algorithms to solve complex problems. It provides tools and techniques to optimize processes, analyze data, and make informed decisions. Computing innovations have been instrumental in solving challenges in fields like healthcare, finance, logistics, manufacturing, and scientific research.
- **Digital Transformation:** Computing innovation is a key driver of digital transformation. It enables organizations to leverage [technology innovation](#) to automate processes, enhance productivity, and deliver digital services. Computing innovations such as mobile applications, cloud computing platforms, and Internet of Things (IoT) devices have transformed the way businesses operate, interact with customers, and manage their operations.
- **Economic Growth and Competitiveness:** Computing innovation plays a vital role in driving economic growth and enhancing competitiveness. It creates new business opportunities, job roles, and industries. Countries and organizations that invest in computing innovation can gain a competitive advantage, attract investment, and stimulate economic development. Computing innovation also fosters entrepreneurship and the creation of startups focused on technological advancements.
- **Accessibility and Inclusivity:** Computing innovation has made technology more accessible and inclusive. User-friendly interfaces, mobile devices, and affordable computing systems have democratized access to information, services, and opportunities. Computing innovations have also contributed to assistive technologies for individuals with disabilities, making technology

more inclusive and enabling greater participation in various aspects of life.

- **Social Impact:** Computing innovation has a profound social impact, improving [social innovation](#) such as the quality of life and addressing societal challenges. It has transformed education by enabling online learning platforms, personalized learning experiences, and educational software. Computing innovations also contribute to healthcare improvements, environmental sustainability, disaster management, and social connectivity through social media platforms and communication technologies.
- **Scientific and Technological Research:** Computing innovation plays a crucial role in advancing scientific research and discovery. High-performance computing, computational modeling, and data analysis techniques enable researchers to process large amounts of data, simulate complex phenomena, and accelerate scientific breakthroughs in fields such as astronomy, genomics, climate modeling, and drug discovery.

1

Here are a few examples of Computing Innovations:

- **Internet of Things (IoT):** Computing innovation in IoT has led to the proliferation of connected devices and smart systems. Examples include:

a. Smart Homes: IoT-enabled devices like thermostats, security systems, and appliances enable remote control, automation, and energy efficiency in homes.

b. Industrial IoT: IoT technologies are used to monitor and optimize industrial processes, enabling predictive maintenance, supply chain optimization, and real-time monitoring of equipment.

c. Wearable Devices: Wearable [technology innovations](#), such as fitness trackers and smartwatches, have enabled individuals to monitor their health, track physical activity, and receive personalized insights.

- **Cloud Computing:** Cloud computing has transformed the way computing resources are provisioned, accessed, and utilized. Innovations include:

a. Infrastructure as a Service (IaaS): Cloud providers like Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform offer scalable and flexible infrastructure services, enabling organizations to rapidly deploy and scale their applications.

b. Platform as a Service (PaaS): PaaS solutions, such as Heroku and Google App Engine, provide developers with pre-configured platforms to build, deploy, and manage applications without worrying about the underlying infrastructure.

c. Serverless Computing: Serverless computing, exemplified by AWS Lambda and Microsoft Azure Functions, allows developers to focus on writing code without the need to manage servers, enabling more efficient and cost-effective application development.

- **Blockchain Technology:** Blockchain has brought [innovation](#) in decentralized and secure digital transactions. Examples include:

a. Cryptocurrencies: Bitcoin and other cryptocurrencies leverage blockchain technology to enable secure and transparent peer-to-peer transactions without the need for intermediaries.

b. Smart Contracts: Blockchain-based smart contracts automate the execution of contractual agreements, ensuring security, transparency, and immutability.

c. Supply Chain Management: Blockchain is used to create transparent and traceable supply chains, ensuring authenticity, reducing fraud, and improving efficiency in areas like food traceability and logistics. [5]

Modern Computing and the Internet

²
The 1970s marked a pivotal moment in the history of computing with the advent of personal computing, catalysed by the invention of the microprocessor. This groundbreaking technology, encapsulated within a single chip, revolutionized the landscape by enabling the creation of compact and cost effective computers tailored for individual use. A landmark in this revolution was the introduction of the Altair 8800 by MITS in 1975. The Altair, offered as a build-it-yourself kit, leveraged the power of the Intel 8080 microprocessor and boasted compatibility with the BASIC programming language. Its arrival ignited a wave of enthusiasm, laying the foundation for the personal computing era.

Following the Altair's lead, other innovators such as Apple and Commodore swiftly entered the fray, introducing their own iterations of personal computers, each contributing to the burgeoning market. However, it was IBM's landmark release of the IBM PC in 1981 that propelled personal computing into the mainstream, particularly within the business community. Powered by the Intel 8088 microprocessor and running on the MS-DOS operating system, the IBM PC set a new standard for functionality and reliability in the realm of personal computing.

The widespread acceptance and adoption of the IBM PC spurred the proliferation of compatible computers, collectively referred to as the PC market. This expansion heralded an era of unprecedented accessibility and versatility, as businesses and individuals alike embraced the newfound capabilities offered by personal computing technology. The interconnected network of PCs fostered a dynamic ecosystem of software development and innovation, paving the way for transformative advancements across various industries.

Basically, the emergence of personal computing in the 1970s and its subsequent evolution throughout the 1980s epitomized a seismic shift in the computing landscape, democratizing access to computing power and catalyzing profound societal and economic changes. This era marked the dawn of a new age, characterized by the empowerment of individuals and organizations through the transformative potential of computing technology.

The 1990s marked a pivotal period characterized by the burgeoning influence of the internet⁸ and the nascent development of mobile computing technologies. Tim Berners-Lee's groundbreaking invention, the World Wide Web, conceived in 1989, rapidly gained widespread accessibility by the mid-1990s. This epoch-defining innovation transformed global communication dynamics, facilitating unprecedented connectivity and information sharing across geographic boundaries.

Simultaneously, the late 1990s witnessed the embryonic emergence of smartphones, heralding a new era of mobile computing. Among the pioneering

devices, the IBM Simon, unveiled in 1993, holds the distinction of being the first commercially available smartphone. Boasting features such as a touchscreen display, fax and email capabilities, and a selection of rudimentary applications, the Simon represented a bold leap forward in mobile technology. However, its exorbitant price tag and ahead-of-its-time functionality hindered widespread adoption.

The subsequent commercial success of the BlackBerry in 1999 marked a significant milestone in the evolution of smartphones. Targeting business professionals, the BlackBerry revolutionized mobile communication by enabling on-the-go email correspondence, garnering widespread acclaim and popularity within corporate circles. Nevertheless, it was the game-changing introduction of the iPhone in 2007 that catapulted smartphones into the mainstream consciousness. With its groundbreaking touch-based interface and the revolutionary App Store ecosystem, the iPhone redefined user expectations and set a new benchmark for mobile computing excellence. So therefore the 1990s witnessed a convergence of technological advancements that reshaped the fabric of modern society. From the democratization of internet access to the dawn of mobile computing, this transformative era laid the groundwork for the interconnected digital landscape that defines contemporary life. [6]

In my opinion the evolution of computing showcases human creativity and our solid drive for advancement. Beginning with basic tools like the abacus and culminating in the potential of future quantum computers, computing has progressed significantly, influencing every facet of contemporary society. Delving into the historical backdrop and technological strides that have propelled computing, we uncover valuable perspectives on the future's challenges and opportunities. With innovations like artificial intelligence and quantum computing on the horizon, we stand poised at the threshold of a new computing era, where the potential for the future knows no bounds, constrained only by our capacity to imagine.



- [1] M. Rouse, "What Does Computing Mean?," *Computing*, 2012.
- [2] J. Smith, "A Brief History of Computing google scholar," *Computing*, pp. 1-5, 2020.
- [3] T. Williamson, "History of computers: A brief timeline," *Computing*, 2023.
- [4] J. B. Copeland, "The Colossus," *Encyclopedia Britannica*, 2024.
- [5] N. Jain, "Computing Innovation," *What is Computing Innovation? Definition, Examples and Best Practices*, July 15 2023.
- [6] T. i. C. T. a. authors, "The History of Computers: A Fascinating Journey," *The Birth of Modern Computers*, 20 April 2023.

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GRADEMARK REPORT

FINAL GRADE

40/100

GENERAL COMMENTS

For this assignment you were required to produce a report that met the following requirements.

Requirement list

Title page: yes

A table of contents : yes

using words navigation headers: yes

A table of figures : no

An introduction: no

The main body: yes

A conclusion: no

References using words referencing system: yes

Footer on every page except the title page: no

Appendix if required: n/a

Any pictures used captioned appropriately: no

Breakdown

Engagement with literature 15/40

Knowledge and understanding 3/5

Cognitive and intellectual 2/5

Transferable Skills for Life and Professional Practice
20/50

Comment

This was bordering on an academic misconduct inquiry, you need to be more careful if you are copying and pasting from other sources you need to cite them carefully.

The overall layout was a bit of a mess, very inconsistent fonts, sizes and the flow was rather messy. Take this as a learning opportunity

take note, the word count is way over!

PAGE 1



Comment 1

Not the best format for a table of contents but it is one.

PAGE 2



Comment 2

Why the ampersand?



Comment 3

The inconsistent font looks really unprofessional



Comment 4

Include the reference before the period.



Comment 5

perhaps a table would have been ideal to encapsulate this data?

PAGE 3

PAGE 4



Comment 6

dont include hyperlinks in text like this, this is what a reference is for



Comment 7

caption your images / include a table of figures

PAGE 5

PAGE 6

PAGE 7

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Comment 8

a header here would have been good, to indicate that a new section begins