HELLO,

This is my study guide for the book “Computing A Concise History” by Paul E. Ceruzzi. For each chapter I will be defining three key terms from a chapter within the book. I hope you find this guide helpful.
INTRODUCTION
DIGITAL
A system of data to transmit information.
PARADIGM

Paradigm by definition is a pattern of something. Ceruzzi identifies a digital paradigm within the history of computing. A shift in counting in base 10 to base two, binary code. This became the foundation of computing as we know it today.
CONVERGENCE
Computing comes from several different techniques, devices, and machines each with its own separate history.
THE DIGITAL AGE

Telecommunications
Binary
Bits/Bytes
TELECOMMUNICATIONS

Using technology to communicate over distances. First came morse code for telegraphs then followed by the invention of the telephone. Early computer networks we now associate with the internet were anticipated by similar uses of the telegraph.
**BINARY**

Expression of data using ones and zeros or base-2.

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101010101101000011010
100000101000100101010
101010111000110010101
010111110000110101010
101010101110100010101
101010101001001010101
101010101010101001101
101010101000110011100
010101010101010101010
010101010000110011100
010101010100110001001
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**THE DIGITAL AGE TERMS**
BITS/BYTES
From information theory bits/bytes are an 8-bit coded character system used as a unit for digital information.

THE DIGITAL AGE TERMS
APPS

Third-party programs that can calculate, play games, view movies, take pictures, locate one’s position, record and play music, send and process text, and make phone calls.
ALAN TURING
(1912-1945)
Alan Turing theorized a machine that could solve complex mathematical problems. His machine had infinite memory capacity with a length of symbols that could be written, erased, or read. The description of his machine was the first theoretical description of the fundamental quality of computers.

Source: http://www.rutherfordjournal.org
COMPUTER

The definition has changed over the years, but generally refers to a machine that performs calculations, stores data, and carries out sequences of operations automatically.

THE FIRST COMPUTERS TERMS
THE STORED PROGRAM PRINCIPLE

UNIVAC
Vacuum Tube
Moore’s Law
UNIVAC

(1951)
Acronym for “universal automatic computer.” From the creators of the ENIAC, J. Presper Eckert and John Mauchly, came the UNIVAC. This computer was designed as a more general purpose machine suitable for any application one could program for it.

Source: http://upload.wikimedia.org/
VACUUM TUBE

Used in early computers like Colossus and ENIAC, vacuum tubes are a device that switches electrons in a vacuum, excited by a hot filament.

Source: http://www.radio-electronics.com/
MOORE’S LAW
The belief that the number of transistors on an integrated circuit doubles every two years.

Source: http://blog.trentonsystems.com/
THE CHIP AND SILICON VALLEY

Integrated Circuit
Silicon Valley
Dumb Terminal
INTEGRATED CIRCUIT

A traditional circuit with all the typical components, such as resistors, transistors, capacitors, and their wires but now combined together on a single piece of silicon. Often referred to as the microchip or chip.

Source: https://dlnmh9ip6v2uc.cloudfront.net/
SILICON VALLEY

A phrase, coined by journalist Don Hoefler in 1971, used to describe the region near Santa Clara Valley below San Francisco where many minicomputer companies were located.

Source: [http://www.rockiesventureclub.org/](http://www.rockiesventureclub.org/)
IBM SYSTEM/360

Announced in 1964, System/360 was IBM’s newest line of mainframes. The machines were designed to address both scientific and business customers. The system was not just one computer but a line of computers from inexpensive models to high-end models made for numerical calculations.

Source: [http://upload.wikimedia.org/](http://upload.wikimedia.org/)
RAM

RAM, short for random-access memory, is a portion of a computer’s memory that has the highest access speeds but low capacity. Originally referred to as a disk with information in random placement but now refers to the internal memory of a computer.

Source: http://cosmicpc.com/
ROM

ROM, short for read-only memory, is the portion of a computer’s memory that stores data that can only be read and not changed by the user.

Source: http://prepare.icttrends.com/
**ALGORITHM**

A limited set of rules that give a sequence of operations to solve a specific type of problem.

**AN ALGORITHM FOR BAKING A CAKE**

1. MIX INGREDIENTS
2. SPREAD IN PAN
3. BAKE AT 360
4. TEST WITH FORK
   - NOT READY
   - READY

   **FLOW CHART**
   - REMOVE FROM OVEN
   - LET COOL
   - EAT

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**THE MICROPROCESSOR TERMS**
THE INTERNET, WORLD WIDE WEB

HTML

Local Area Network (LAN)

World Wide Web
Berners-Lee explored ways of delivering information on the web. Using formatting language originally in use on IBM mainframes, hypertext markup language (HTML). HTML was a simple easy to learn language to build web pages.
LOCAL AREA NETWORK (LAN)

Created by The Xerox Palo Alto Research Center, LAN is a connection of computers at the local level such as an office or school. With the use of ethernet connection (also created at Palo Alto Research Center) time-sharing became a more practical application.
WORLD WIDE WEB

A program on the internet that allows users to access information easily. Data can be stored locally or on another continent regardless of where the computer or server is located.
CONCLUSION
DISK STORAGE
Data recorded on a disk by magnetic, optical, or mechanical changes to the surface layer.

Source: http://www.cnmeonline.com/
DATABASE SOFTWARE

Specific software designed to interface with the user and database itself. The system is typically able to create, query, update, and administrate database or databases.
QWERTY KEYBOARD

The modern-day layout for computer keyboards is the QWERTY layout. Originally designed for Sholes and Glidden Typewriter in 1873 it remains popular largely because other alternatives fail to show major advantages.
REFLECTIVE ESSAY

I believe convergence and the human-machine interface are the two major threads that will continue in the next phase of computing. Ceruzzi’s idea of convergence is simply the notion that many different techniques, machines, and devices are coming together creating one computation device. His example of the smart phone shows how one device has evolved to more than just a phone. It has now converged to be not only a phone but a camera, web browser, radio, teletype, etc. In chapter one he also explains how the internet was ultimately a convergence of telephone networks with computer time-sharing. I believe many other technologies are heading in this direction as well. The automobile is a great example, what began as a purely mechanical machine has now become digital converging with computers and phones. We have the ability to talk to our cars and they give us directions as well as make calls or change the radio station. This leads into his other notion of computing, the human-machine interface. This examines the way humans interact with digital devices. He asks the question, “Are we trying to create a mechanical replacement for a human being, or a tool that works in symbiosis with humans, an extension of the human’s mental faculties?” In Hayles book “How We Think’ she addresses a similar idea called “technogensis.” The idea is that as humans evolve our technologies evolve with us and our cognition is slowly becoming one. I would say that technology isn’t replacing humans as much as humans are failing to keep up with how newest technologies work. Factories were designed for a repetitive, task oriented job. A job easily replaced by a digital device. To reiterate what Douglas Rushkoff is trying to say in his book “Program or be Programmed” we must learn to code or we risk being coded ourselves. It’s not that the computer is growing with us separately but we are slowly growing with it and if we don’t learn how they operate and how we can control them they can begin to control us. The future of technology is so uncertain and growing so rapidly. Although, Ceruzzi’s concise history does help give a bigger scope of the computing world. By getting a better understanding of what has happened in the past we may be able to lay a better road for the future.