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Introduction To This Preview Edition

This history is a simple timeline which should hopefully help you navigate the history of text. The layout is designed to be read in the 'Reader' PDF viewer with the companion Liquid application where you can easily fold the document and search based on selected text, both which are part of the same Future Text Initiative project and available for free: https://www.augmentedtext.info

Remember, this is a preview / review edition

For any suggestions or issues, please email the editor Frode Alexander Hegland at frode@hegland.com and you will be credited as a Contributor. It would be great if you could use this format:

Year (even if you have to use 'ca' or other terms) **Event/thing** by **person** at **organisation** (if applicable)

This will never be, nor aims to be, a complete and accurate history of text. There will be errors in omission, facts and dates will only be solid for the most recent events. The timeline format is ill suited for non-sharply delineated periods of time so we have tried to address that with language, such as liberal use of 'ca' and date ranges. The history of ideas is especially fraught and there will be issues we have not even thought about. What this aims to be however, is a useful guide for at least some of the major events and sequences which has brought us where we are and which may help guide us to where we want to be with text. Since the format is so simple we aim that it should at least be useful to students to get a lay of the temporal land.

To add (known issues to cover)

More on ancient texts. Manuscript annotations. History of notes.

More on non-Western text.

Other symbolic communication (cave, flags, makeup).

13,8 Billion Years Ago

ca 13,800,000,000 years ago the universe comes into being. There was no ‘instant’ of creation. The universe didn’t flash into existence, it came into being as an all-encompassing, interactive, quantum wave. There is no going back. From pure energy to all there is today, the universe gets more complicated and more interactive one Planck moment at a time

ca 4,540,000,000 years ago the earth and the solar system is formed

ca 4,400,000,000 years ago oceans form, providing a substrate for life with rich potential for interactions

Let’s pause before we continue the journey into the next, great step (that of life itself). Look at these dates - the solar system has been around for roughly 1⁄3 of the universe’s existence. That is something to marvel at. It’s easy to imagine vast intergalactic civilizations having come and gone over the life of the universe, but it turns out that there actually isn’t that much time in the past. We’re pretty early inhabitants. There may have been one generation of stars similar to our own before us —maximum. So, maybe there hasn’t been enough time for advanced civilizations to evolve. That we might be one of the most advanced consciousness in creation (or perhaps the only one) is a sobering thought. Can we handle this responsibility?

ca 4,000,000,000 Self-replicating molecules appear. Life is happening. It’s pretty basic, but it’s happening

ca 3,500,000,000 Single-celled organisms

ca 3,000,000,000 Viruses, though they may be much older

ca 580,000,000 Complex multicellular life

ca 250,000,000 or less–it is hard to be sure, DNA, with complex ‘letters’ of interaction takes life to a whole new level

250 Million-3,6 Million

2,7-2,5, 1,9-1,7 and 1,1-0.9 million years ago, the earth sees rapid climate change (on the scale of lifetimes of individuals, not species) spurring on hominid evolution in the Rift Valley in Africa, with each period coinciding with brain development. During the period 1,9-1,7 the number of hominid species reached its peak and Homo Erectus appeared. Tool development also coincided with these cycles of rapid climate change, including Oldowan, Acheulean and Mousterian. For more on this topic, and how the planet shaped us in general refer to *Origins* by Lewis Dartnell

ca 3,600,000 Our ancestors walk upright and they loose body hair

ca 2,300,000 Homo Habilis, the tool user, is our oldest ancestor to use tools

ca 2,000,000 Olduwan tool Culture begins. Its key feature was the method of chipping stones to create a chopping or cutting edge.

2,000,000-50,000 BCE

ca 500,000 Earliest evidence of purpose-built shelters, found near Chichibu, Japan

ca 400,000 Early humans begin to hunt with spears

ca 280,000 First complex stone blades and grinding stones

ca 150,000 Humans possibly capable of speech

ca 100,000-200,000 Modern Humans

50,000-3,000 BCE

ca 50000 Our **‘**Great leap forward’. Human culture starts to change more rapidly (burying our dead ritually, clothes from animal hides, complex hunting techniques)

ca 44000 Oldest known cave painting, found in the Franco-Cantabrian region in western Europe and Sulawesi, Indonesia

ca 35400 Oldest-known example of figurative art, in Sulawesi, Indonesia

ca 11000 Cave art by young children in the Rouffignac Cave

ca 7500 Near Eastern counters ‘Tokens’ to keep track of goods are the earliest known antecedents of the Mesopotamian Cuneiform script

ca 6600 Eleven isolated symbols carved on tortoise shells were found at Jiahu, an archaeological site in the Henan province of China, some bearing a striking resemblance to certain modern characters but the connection is not established

ca 4500 Proto-Indo-European language developed, probably somewhere near the Black Sea, and probably spreading because its speakers invented horse riding. Today 60% of modern humans speak a daughter language, 27% as their mother tongue

ca 4000 Possible preliterate images which may have been symbols (such as Gerzean pottery) which could have been precursors to Egyptian hieroglyphic writing

ca 3500 Egyptian Proto-hieroglyphic symbol systems

ca 3300 Reduction of three-dimensional Near Eastern tokens into two-dimensional signs on envelopes holding tokens

ca 3200 First logographic Near Eastern accounting lists written on clay tablets by impressing tokens

ca 3100 First logographic proto-cuneiform signs traced with a stylus on accounting tablets

ca 3000 First proto-cuneiform phonetic signs to represent personal names on economic tablets

ca 3000 First known use of papyrus for writing. Previously Egyptians had been writing on stone and pottery

ca 3000-1000 Hieratic (‘priestly') cursive writing system used for Egyptian until the rise of Demotic. Primarily written in ink with a reed pen on papyrus.

3000 BCE

2900 First known air mail. Egyptian sailors released carrier pigeons from ships to pre-announce their arrival

ca 2800 First full sentence written in mature Egyptian hieroglyphs so far discovered. Found on a seal impression in the tomb of Seth-Peribsen at Umm el-Qa'ab

ca 2700 First cuneiform texts which departs from accounting: funerary texts

ca 2400 First cuneiform tablet dealing with trade

ca 2300 First written sentences. These texts were inscribed on worshippers' votive statues dedicated to a god and requesting immortality

ca 2300 First named author, Enheduanna, daughter of Sargon the Great

ca 2300 Oldest known dictionaries of cuneiform tablets with bilingual Sumerian–Akkadian wordlists, discovered in Ebla (modern Syria)

ca 2000 Classical period of the Sumerian Cuneiform Script

ca 2000 First known library catalog in the Sumerian city of Nippur

ca 2000 Abacus (from Greek meaning "board strewn with sand or dust used for drawing geometric figures or calculating"), the first known calculator, is invented in Babylonia (Iraq)

ca 2100–1500 Proto-Sinaitic script, the earliest trace of alphabetic writing known, in the Egyptian Pharaoh's turquoise mines at Serabit el-Khadim in the Sinai Peninsula

2000 BCE

ca 1900 First known cipher (not yet decoded), in tomb of Khnumhotep II

ca 1750 Hammurabi's Code, by Hammurabi, ruler of Babylon

ca 1600 Earliest known medical document, the *Edwin Smith Medical Papyrus,* thought based on material from 3000 BCE, including the first reference to the human brain

ca 1500 Phoenician alphabet of 22 consonants was among the early mature alphabets. It spread over the Mediterranean and led to the Greek, Hebrew, Roman, Arabic and modern alphabets

ca 1500 Earliest book known, the Ebers papyrus, a 20 meter scroll

ca 1500 First known use of movable type (stamps reused to repeat symbols identically), the Phaistos Disc, and first font

ca 1300 First known inclusion of words on a map, in Mesopotamia

ca. 1300–1190 The Ugaritic writing system a cuneiform augmented abjad (consonantal alphabet) for Ugaritic, an extinct Northwest Semitic language

ca 1300s Wax tablet with stylus: origins are uncertain but known to have been used at least until the 1860s CE, for example in the fish market in Rouen, France

ca 1250–1192 Earliest confirmed evidence of Chinese script, Oracle bones script

ca 1200 Torah was copied onto a scroll by Moses according to the Hebrew tradition (date disputed)

ca 1100 BC – 256 Chinese Jinwen (Bronzeware Script)

1000-300 Chinese bronze inscriptions/script

1000s the Gezer Calendar, first vertically-formatted list

1000 BCE

1000 Chinese Seal script evolved organically out of the bronze script

900–400 The Greek Alphabet emerged around the ninth or eight century BCE which had distinct letters for vowels, not only consonants. Many versions of the Greek alphabet existed but by the fourth century it had been standardised into twenty-four letters, ordered from alpha to omega

650-400s CE Demotic Egyptian script following Late Egyptian and preceding Coptic. The term was first used by the Greek historian Herodotus to distinguish it from hieratic and hieroglyphic scripts

500s First known curated museum. Mesopotamian artifacts spanning 1,500 years, by Princess Ennigaldi, daughter of King Nabonidus

ca 550 First official mail service, by Cyrus the Great, stretching from Post, Iran to Hakha, Myanmar

ca 500 Aṣṭādhyāyī by Pāṇini, quasi-generative grammar of Sanskrit, anticipating Chomsky

300s The basic form of the Codex invented in Pergamon

300s Reed pens for writing on papyrus

310/305–240 The Pinakes, the first library catalog at the Library of Alexandria

285–246 Alexandria founded by Alexander the Great

283 Library of Alexandria founded by Ptolemy I and II

257–180 Punctuation is invented at the Library of Alexandria by Aristophanes of Byzantium

256-206 Chinese Zhuanshu (Seal Script).

206 BC–220 AD Chinese Zhuanshu simplified to Lishu (Clerical script)

250 Parchment Scrolls

ca. 230 The letter ‘G’, by Spurius Carvilius Ruga, the first known inventor of a letter

200s Quill used until about the 19th century CE, when replaced by the pen

200s Alphabetization developed, probably in Alexandria by Callimachus to catalog the Great Library

200s Erya, first known dictionary

before 134 First character encoding, by Cleoxenus and Democleitus, described by Polybius ca 134 BCE. Each Greek letter was converted to 2 digits (1 to 5), then to smoke or fire signals

63 & ‘ampersand’ proposed by Marcus Tiro

ca 55 The book in the form of folded sheets, not just a stack of sheets, by Julius Caesar, in his reports on the Gallic Wars

BCE – CE

ca 50 Earliest surviving example of Old Roman Cursive script: a speech by Claudius

79 Earliest tables of contents by Pliny the Elder in Naturalis Historia (Natural History)

79 Earliest known marketing pun and portmanteau word: wine jars in Pompeii marked ‘Vesuvinum’ (Vesuvius wine)

79 Two SATOR AREPO word squares in Pompeii, perhaps with Christian associations, making them the earliest surviving Christian inscriptions

100 CE

200

ca 200 New Roman (or Minuscule) Cursive script which evolved into modern lower case letterforms

220 Earliest surviving woodblock printed fragment (China)

300

ca 300 Maya writing

ca 300 Latin handwriting starts to use larger letters at the start of sentences, though the same shape (not mixed case)

330–360 Codex Sinaiticus, the oldest extant codex; a biblical manuscript written in Greek

367 Old Roman Cursive script banned except for official imperial documents, eventually leading to lower case text (derived from New Roman Cursive) being normal and upper case exceptional

400

420–589 Chinese Kaishu script (Regular Script) replaces Lishu

500

Before 500s Literacy introduced to Japan in the form of the Chinese writing system, via Baekje

500-1000 Florilegium, which are selections of ‘flowers’(select passages) from work, rather than a summary, to help people deal with the volume of books

600

700

ca 700s Word spacing pioneered by Celtic monks

ca 700 St Cuthbert Gospel, the oldest surviving Western book, which still has its original goatskin leather cover

700s Japanese writing develops away from Chinese

800

813 Council of Tours decreed sermons should be in vulgar language not Latin. This may have triggered early Romance languages to be spelt literally, rather than as Latin with distorted pronunciation

842 Oaths of Strasbourg, first surviving document in Romance (early French), with parallel version in Frankish (early Germanic)

854–931 Prototype professional peer-review process recommended in the *Ethics of the Physician* written by Ishāq ibn ‘Alī al-Ruhāwī

900

ca 900 Screen Printing in China during the Song Dynasty

960–1279 Chinese Kaishu script evolves to Songti script

1000

1100

1200

1200s The term ‘Originalia’ is coined in contrast to Florilegia, indicating a greater authority to original sources than excerpts

1246 Call numbers associated with the location of books, in the Library at Amiens Cathedral in France

1290 *Ars Magna* by Ramon Lull

1300

1377 *Jikji* the oldest surviving book printed using moveable metal type by Gyeonghan

1300s The word ‘history' meant, “relation of incidents whether true of false.” The word goes back to the Proto-Indo-European root of wid-tor weid, it literally mean “to know” and “to see.”

1304–1374 Humanism founded by Francesco Petrarch, reviving enthusiasm for ancient Roman thinkers, with books as the centre of their discourse

1400

1400s First prototype of a Jacquard-type loom by Jean le Calabrais

1455 ‘Gutenberg Bible’, also-called Forty-two-line Bible, or Mazarin Bible, the first complete moveable type printed book extant in the West, printed by Johannes Gutenberg

1470 Roman type, a combination of capital letters inspired by ancient Roman architectural inscriptions and Carolingian minuscules, developed by Nicolas Jenson

1470 First printed joke book, Facetiae by Poggio Bracciolini

1470 Earliest extant example of sequential numbering in a book, *Sermo in festo praesentationis beatissimae Mariae virginis,* printed in Cologne

Late 1470s, title, author, and publisher information included by printers on the first inside page of a book

1479 *Manicule in Breviarium totius juris canonici*, compiled by Paolo Attavanti printed in Milan by the German firm of Leonhard Pachel and Ulrich Scinzenzeller

1481 First marginal annotations used in printed texts on a Venetian edition of Horace with commentaries by Acro and Porphyry

1483 First Talmud printed

End of the 1400s almost all printed books have title pages

1500

1500s Garamond typeface. Claude Garamont, a French type designer, publisher and punch-cutter lived in Paris. Thus, many old-style serif typefaces are collectively known by his name as ‘Garamond’

1500s The word ‘history’ is differentiated into ‘history’ and ’story’ in English, though in other languages, such as Spanish and Norwegian there is still no distinction

1500s Maya writing mostly fallen out of use

ca1500 Etching for printing by Daniel Hopfer

1501 Italic typeface by Aldus Manutius

1513 Likely first pagination with Arabic numerals in *Cornucopiae* by Niccoloo Perotti

1538 Latin-English wordbook by Sir Thomas Elyot

1539 Henry the Eighth’s *Great Bible*, by Myles Coverdale banning all glossing

1545 Bibliotheca universalis by Conrad Gessner, a complete bibliography of all printed books (except itself)

1557 The Geneva Bible, the primary Bible of 16th-century English Protestantism displaces the Great Bible

1560 First blueprints for the modern, wood-encased carpentry pencil by Simonio and Lyndiana Bernacotti

1564 Graphite for pencils comes into widespread use following the discovery of a large graphite deposit in Borrowdale, England

1568 Bishops' Bible, English translation of the Bible produced under the authority of the established Church of England and later used as the base text for the King James Bible

1565 Mechanical/Lead holder pencil by Conrad Gesner

1593 Index to content in a book, by Christopher Marlowe in Hero and Leander

1595 The first printed catalog of an institutional library, the *Nomenclator* of Leiden University Library

1600

1600s European Newspapers

1600 *Orbis Sensualium Pictus* textbook for children by John Amos Comenius

1611 *King James Bible*

1642 Mezzotint Printmaking by Ludwig von Siegen

1648 Part emoticon ‘(smiling yet:)’ by poet Robert Herrick

1665 First academic journal, *Journal des sçavans* (Paris) and shortly after—same year, *Philosophical Transactions of The Royal Society* (Royal Society, London).

1667 Acoustic string telephone by Robert Hooke

1674 First decipherment of a script, the Staveless Runes, by Magnus Celsius

1677 Artificial versifying by John Peter

1700

1704 Newton’s *Opticks*, the first major scientific book published in English, not Latin

1706 Newton’s *Opticks* translated into Latin

1723 *De Etruria regali libri VII* Thomas Dempster used sans serif typeface to represent inscriptions in Ancient Greek and Etruscan

1725 Improvement to the Jacquard-type loom by Basile Bouchon who introduced the principle of using a perforated band of paper

1731 First peer-reviewed journal, *Medical Essays and Observations* (Philosophical Society of Edinburgh, Edinburgh).

1739 Last international treaty written in Latin, the Treaty of Belgrade, indicating the new pre-eminence of living languages over dead ones

1748 First modern use of sans-serif (“grotesque”) lettering, anonymous letter carver, grotto at Stourhead, England

1755 *A Dictionary of the English Language* by Samuel Johnson

1767 Index Card organization by Carl Linnaeus

1770 Natural rubber used as an eraser by Edward Nairne

1771 UK Parliament formally gives journalists the right to report proceedings

1772 Aquatint printing by Peter Perez Burdett, named by Paul Sandby

1780 Didot and Bodoni by Firmin Didot and Giambattista Bodoni, the first modern modern

Roman typefaces

1780 First card catalog by librarian Gottfried van Swieten, Prefect of the Imperial Library, Austria

1783 James Madison of Virginia proposes the creation of a congressional library

1786 Rounded sans-serif script font developed by Valentin Haüy for the use of the blind to read with their fingers

1787 Constitution of the United States, mentioned here as a milestone in written documents producing and framing a society

1787 *The Federalist Papers* by Alexander Hamilton with John Jay and James Madison in *The Independent Journal*, considered the most important documents for interpreting and understanding the original intent of the Constitution of the United States

1791 First card catalog for libraries, using the back of playing cards by a group of men with bibliographic experience led by Barthélemy Mercier

1795 Modern Pencil by Nicholas-Jacques Conté

1796 Lithography by Alois Senefelder

1796 Colour Lithography by Alois Senefelder

1800

1800 The Library of Congress established when President John Adams signed an act of Congress also providing for the transfer of the seat of government from Philadelphia to the new capital city of Washington

1801 Blackboard by James Pillans

1801 Carbon Paper by Pellegrino Turri

1804 Jacquard loom by Joseph Marie Jacquard

1806 Patent for Carbon Paper by Ralph Wedgwood

1810

1816 First typeface without serifs by William Caslon IV

1816 First working Telegraph by Francis Ronalds used static electricity; it was rejected by the Admiralty as “wholly unnecessary”

1817 A Code of Signals for the Merchant Service, the first general system of signalling for

merchant vessels by Captain Frederick Marryat

1820

1822 Mechanical Pencil with a ‘Mechanism to Propel Replaceable Lead’ by Sampson Mordan and John Isaac Hawkins

1828 Pencil Sharpener by Bernard Lassimonne

1830

1836 Chorded Keyboard by Wheatstone and Cooke

1837 Early forerunner of Morse Code by Samuel F. B. Morse, Joseph Henry, and Alfred Vail

1839 Vulcanized rubber used for erasers by Charles Goodyear

1839 Electrical Telegraph commercialised by Sir William Fothergill Cooke

1840

1843 Rotary Drum Printing by Richard March Hoe

1844 Newsprint by Charles Fenerty. Designed for use in printing presses that employ a long web (continuous sheet) of paper rather than individual sheets of paper

1844 Morse Code by Samuel F. B. Morse, Joseph Henry, and Alfred Vail, in use

1846 Printed Output envisioned by Charles Babbage from his Difference Engine 2

1850

1854 Boolean algebra the mathematical basis of digital computing, developed by George Boole in *The Laws of Thought*

1855 International Code of Signals drafted by the British Board of Trade

1857 International Code of Signals published as the Commercial Code

1857 National Telegraphic Review and Operators Guide lists emoticon precursors <3 and :* as shorthand for ‘love and kisses’

1857 *Study On Some Deficiencies in our English Dictionaries*, which identified seven distinct shortcomings in contemporary dictionaries published by the Unregistered Words Committee

of The Philological Society, a small group of intellectuals in London headed by Richard Chenevix Trench

1858 Eraser on pencil by Hymen Lipman

1858 First transatlantic telegraph cable laid by Cyrus West Field

1860

1860s The first card catalog, designed for readers, rather than staff, by Ezra Abbott, Harvard's assistant librarian

1860 Herbert Coleridge succeeds Richard Chenevix Trench as the first editor of the Unregistered Words Committee's effort; this work was the precursor of what eventually became the *Oxford English Dictionary* (OED)

1860 Hectograph, gelatin duplicator or jellygraph printing process by Nelson S. Knaggs

1861 The Unregistered Words Committee published the first sample pages, Herbert Coleridge dies and Frederick Furnivall takes over as editor

1864 Non-Digital 'spam'. Unsolicited group telegram advertisement

1868 Kineograph / Flip-Book by John Barnes Linnett

1870

1870s QWERTY layout by Christopher Latham Sholes

1874 Stencil Duplicating by Eugenio de Zuccato

1874 Typewriters (see previous section)

1876 Telephone patent by Alexander Graham Bell

1876 Telephone Switch, which allowed for the formation of telephone exchanges and eventually networks by Tivadar Puská

1876 Autographic Printing by Thomas Edison

1879 The Oxford University Press agrees to publish The Unregistered Words Committee's dictionary, to be edited by James Murray

1879 *Index Medicus* edited by John S. Billings and Robert Fletcher, published by Frederick Leypoldt

1880

1877 Current definition of entropy, by Ludwig Eduard Boltzmann

1881 Harvard Citation Style (author date) by Edward Laurens Mark at Harvard University

1881 Emoticon precursors as *Puck* magazine published a set of type-set faces expressing joy, melancholy, indifference and astonishment using basic type characters

1883 Téléphonoscope concept by Albert Robida

1884 Linotype by Ottmar Mergenthaler

1884 The Oxford University Press agrees to publish *A New English Dictionary on Historical Principles; Founded Mainly on the Materials Collected by The Philological Society*

1887 Snigger Point by Ambrose Bierce, a precursor emoji/emoticon symbol in the form of an opening parenthesis character '(', but rotated 90° to the left

1888 Ballpoint Pen by John J. Loud

1890

1890 US Census undertaken using the punched-card technology, an invention suggested by John S. Billings to Herman Hollerith in the company which would become IBM

1891 Automatic Cyclostyle duplicating machine by David Gestetner

1895 Universal Decimal Classification (UDC), starting with the Universal Bibliographic Repertory (RBU: *Répertoire Bibliographique Universel*) by Paul Otlet and Henri La Fontaine with the implementation being as card catalogue by Herbert Haviland Field, using the Dewey Decimal Classification system by Melvil Dewey

1895 *A New English Dictionary on Historical Principles* renamed as the *Oxford English Dictionary* (OED)

1900

1901 Trans-Atlantic Radio Signal by Marconi Company

1903 First message to travel around the globe by Commercial Pacific Cable Company, from US President Theodore Roosevelt, wishing "a happy Independence Day to the US, its territories and properties..." It took nine minutes for the message to travel worldwide

1904 Patent for a 'type wheel printing telegraph machine' filed by Charles Krum which

would go on to become Teletype in 1929

1906–7 Photographic Copying Machines by George C. Beidler at the Rectigraph Company

1907 Commercial Transatlantic Radio Telegraph Cable opened by Marconi Company

1910

1910 Felt-tip marking pen by Lee Newman

1910's Teleprinter, Teletext via telegraphs, by

1910 Mundaneum by Paul Otlet and Henri La Fontaine

1910 First criminal caught via wireless telegraph: the murderer Dr Crippen on board a transatlantic ship

1913 Plantin typeface by Frank Hinman Pierpont and draughtsman Fritz Stelzer of the British Monotype Corporation, based on a Gros Cicero face cut in the 16th century by Robert Granjon

1914 Optophone (OCR precursor) by Emanuel Goldberg, a machine which read characters and converted them into standard telegraph code

1914 Handheld Scanner (OCR precursor) by Edmund Fournier d'Albe a machine which read characters and converted them into tones

1920

1920s First full-time Type Designer Frederic Goudy

1922 *Ulysses* by James Joyce, first extensive use of stream of consciousness: text conveying thoughts not speech

1923 Spirit duplicator (also referred to as a Ditto machine, Banda machine, or Roneo) by Wilhelm Ritzerfeld

1925 Corkboard by George Brooks

1927 The Statistical Machine patented by Emanuel Goldberg

1927 Futura typeface family by Paul Renner

1924 Art Color Pencils by Faber-Castell and Caran d'Ache

1928 Standardised punch cards by Clair D. Lake

1929 Hellschreiber by Rudolf Hell, precursor to dot matrix printing

1930

1930 *The Readies*, a concept for portable speed reading by Bob Brown

1931 Knowledge Machine by Emanuel Goldberg

1931 Biro by brothers László Bíró and György Bíró

1932 Times New Roman typeface by Victor Lardent under the direction of Stanley Morison, on a commission of the Times newspaper, based on the Plantin typeface

1934 *Logik der Forschung* by Karl R. Popper advanced the theory that the demarcation of the limit of scientific knowledge, is its 'falsifiability' and not its 'verifiability'

1935 *Monde* book by Paul Otlet

1936 Dvorak Keyboard Layout by August Dvorak

1937 *World Brain* by H. G. Wells

1940

1940s-60s Information as a concept, through the works of Claude Shannon (information theory), Warren Weaver (machine translation), Alan Turing (universal computer), Norbert Wiener (cybernetics) and Friedrich Hayek (invisible hand is information)

1942 Xerography Patent by Chester Carlson. The technique was originally called electrophotography

1943 The term 'acronym' coined, meaning word formed from the first letters of a series of words

1944 Marking pen which held ink in liquid form in its handle and used a felt tip by Walter J. De Groft which becomes 'Sharpie'" in 1964

1945 Memex proposed by Vannevar Bush in *As We May Think*

1945 ENIAC first programmable, electronic, general-purpose digital computer by J. Presper Eckhart and John Mauchley (University of Pennsylvania)

1946 *A Logic Named Joe* by Murray Leinster

1947 Machine translation, suggested in a letter from Warren Weaver suggests to Norbert Wiener

1946 Electric Printing Telegraph by Alexander Bain, precursor to the fax

1948 *A Mathematical Theory of Communication* by Claude Shannon, including the word 'bit,' short for binary digit, credited to John Tukey

1948 *The Human Use of Human Beings: Cybernetics and Society* by Norbert Wiener. The word cybernetics was first used in the context of the study of self-governance of people by Plato and in 1834 by André-Marie Ampère to mean the sciences of government in his classification system of human knowledge. Here Norbert Wiener introduced the term for the scientific study of control and communication in the animal and the machine

1949 *El libro mecánico* by Ángela Ruiz Robles

1949 *Translation* memo by Warren Weaver

1949 The Lumitype-Photon Phototypesetting by the Photon Corporation based on the Lumitype of Rene Higonnet and Louis Moyroud

1949 Fr Roberto Busa starts work on computerizing his *Index Thomisticus* (St Thomas Aquinas), in the process founding Humanities computing

1949 The Chinese Language Character Reform Association established

1950

ca 1950 Niklas Luhmann's Zettelkasten system for storing and cross-referencing information in card indexes

1950 Whirlwind computer at MIT including a display oscilloscope becomes operational

1950s-60s Simplified Chinese characters created by works moderated by the government of the People's Republic of China

1951 Doug Engelbart's Epiphany: "Problems are getting more complex and urgent and have to be dealt with collectively – we have to deal with them collectively"

1951 *Qu'est-ce que la documentation?* by Suzanne Briet

1951 Regular expressions by mathematician Stephen Cole Kleene

1951 Linear B deciphered as a syllabic script for early Greek, by Michael Ventris

1951 LEO I the first general-purpose business computer, Lyons Ltd, text on paper-tape readers and punches

1951 UNIVAC (UNIVersal Automatic Computer) by J. Presper Eckert and John Mauchly at EMCC/ Remington Rand

1952 Manchester Mark I computer Love Letter Generator by Christopher Strachey, using a random number algorithm by Alan Turing

1952 Antitrust Investigations And Trial Against IBM starts, dragging on for thirty years, finally being dismissed in 1982. IBM will cautiously monitor its microcomputer business practices, fearful of a repeat of government scrutiny

1952–4 Dot Matrix Teletypewriter developed by Fritz Karl Preikschat

1953 UNIVAC 1103 designed by Seymour Cray at the Engineering Research Associates and built by the Remington Rand corporation

1953 Magic Marker by Sidney Rosenthal

1953 The Lumitype-Photon Phototypesetting System first used to set a complete published book and to set a newspaper

1954 Charactron by J. T. McNaney at Convair was a shaped electron beam cathode ray tube functioning both a display device and a read-only memory storing multiple characters and fonts on the UNIVAC 1103

1954 IBM 740 CRT used computers to draw vector graphics images, point by point, on 35 mm film 1956 Keyboard and Light Pen for computer text input at MIT on the Whirlwind computer

1954 The Chinese Language Character Reform Committee was founded

1956 Chinese List of Simplified Characters issued by State Council

1956 First commercial computer sold with a moving-head 'hard disk drive', the 305 RAMAC by IBM

1956 'Artificial Intelligence' term coined by John McCarthy at MIT

1957 COMIT string processing programming language by Victor Yngve and collaborators at MIT

1957 Univers typeface family by Adrian Frutiger

1957 The term 'initialism' coined, a written word formed from the first letters of other words in a name or phrase. NATO, where the letters are sounded as a word are regarded as acronyms. FBI, where the letters sound as letters, are initial-words or initialisms

1957 Dye-Sublimation printing by Noël de Plasse at Sublistatis SA

1957 Helvetica typeface family by Max Miedinger

1958 *The Uses Of Argument* by Stephen Toulmin introduces the argumentation diagram

1958 Lisp programming language designed by John McCarthy at MIT and developed by Steve Russell, Timothy P. Hart, and Mike Levin

1958 Integrated Circuit (IC) by Jack Kilby at Texas Instruments

ca 1958 Speed reading by Evelyn Wood

1960

1960s 'Word Processing' term invented by IBM

1960 PLATO (Programmed Logic for Automatic Teaching Operations) generalized computer-assisted instruction system by Donald Bitzer at the University of Illinois

1960 Colossal Typewriter by John McCarthy and Roland Silver at Bolt, Beranek and Newman (BBN)

1960 Ted Nelson's epiphany about interactive screens becoming universal, on-line publishing by individuals

1960 Suggestion for emoticon by Vladimir Nabokov

1960 *Man-Computer Symbiosis* by J.C.R. Licklider at BBN

1961 Selectric Typewriter by IBM with a ball print head instead of jamming bars, which could be easily replaced for different fonts and left the paper in place and moved the type ball instead

1961 Information Flow in Large Communication Nets by Leonard Kleinrock

1961 Synthesised Speech by John Larry Kelly, Jr and Louis Gerstman of Bell Labs

1961 Expensive Typewriter by Steve Piner and L. Peter Deutsch

1962 TECO (Text Editor & Corrector), both a character-oriented text editor/word processor and a programming language, by Dan Murphy

1962 Highlighter Pen by Frank Honn

1962 Modern fibre-tipped Pen by Yukio Horie at the Tokyo Stationery Company

1962 Enciclopedia Mecánica by Ángela Ruiz Robles

1962 RUNOFF by Jerome H. Saltzer. Bob Morris and Doug McIlroy (text editor with pagination)

1962 *The Structure of Scientific Revolutions* by Thomas S. Kuhn

1962 Spacewar! by Steve Russell in collaboration with Martin Graetz and Wayne Wiitanen

1962 *Augmenting Human Intellect: A Conceptual Framework* by Doug Engelbart at SRI

1963 Sketchpad (a.k.a. Robot Draftsman) software by Ivan Sutherland at MIT

1963 The 'smiley face' by Harvey Ball, emoticon precursor

1963 Augmentation Research Center by Doug Engelbart at SRI

1963 Transport font, a sans serif typeface first designed for road signs in the United Kingdom by Jock Kinneir and Margaret Calvert

1963 TJ-2 (Type Justifying Program) by Peter Samson (first page layout program)

1963 ASCII (American Standard Code for Information Interchange) a character encoding standard for electronic communication developed from telegraph code

1963 'Hypertext' word coined by Ted Nelson

1963 Computer Mouse and Chorded Keyset by Doug Engelbart

1964 ELIZA natural language-like processing computer program by Joseph Weizenbaum at the MIT Artificial Intelligence Laboratory

1964 LDX (Long Distance Xerography) by Xerox Corporation, considered to be the first commercial fax machine

1964 *Understanding Media* by Marshall McLuhan

1964 ASCII 7-bit standard

1964 TYPSET text formatting software used with the RUNOFF program

1965 TV-Edit, one of the first CRT-based display editors/word processors that was widely used by Brian Tolliver for the DEC PDP-1 computer

1965 Semi-Conductor based thermal printer by Jack Kilby at Texas Instruments

1965 'Hypertext' by Ted Nelson first in print, as well as first design (zipper lists)

1965 MAIL Command for MIT's CTSS, proposed by Pat Crisman, Glenda Schroeder and Louis Pouzin, implemented by Tom Van Vleck and Noel Morris

1966 *Object Oriented Programming* by Ole-Johan Dahl and Kristen Nygard at the Norwegian Computing Center

1967 HES (The Hypertext Editing System) co-designed at Brown University by Ted Nelson, Andy van Dam and Steve Carmody, as well as other student implementors, based in part on a spec Ted Nelson had written previously for Harcourt Brace

1967 The Quick-Draw Graphics System masters thesis by Jef Raskin

1967 Logo programming language designed by Wally Feurzeig, Seymour Papert, Cynthia Solomon at Bolt, Beranek and Newman

1968 A 'low-tack', reusable, pressure-sensitive adhesive accidentally created by Dr. Spencer Silver at 3M which would eventually be marketed as Post-it® Note

1968 Doug Engelbart's Seminal Demo of the NLS system at FJCC, including windows, hypertext, graphics, efficient navigation and command input, video conferencing, the computer mouse & chorded keyset, word processing, dynamic file linking and revision control

1968 Dynabook Concept computer by Alan Kay

1968 Digi Grotesk, digital typeface by Rudolph Hell

1968 *The Art of Computer Programming* by Donald Knuth

1968 OCR-A monospaced typeface for Optical Character Recognition by 23 American type foundries

1968 OCR-B monospaced typeface by Adrian Frutiger for Monotype, following the European Computer Manufacturer's Association standard

1968 Serial Impact Dot Matrix Printer by OKI

1968 SHRDLU natural language understanding computer program by Terry Winograd at MIT

1969 FRESS, inspired in part by HES and Engelbart's NLS by Andy van Dam and his students at Brown University

1969 GML, leading to SGML by Charles Goldfarb, Edward Mosher and Raymond Lorie at IBM

1969 Ed line editor/word processor for the Unix, developed in by Ken Thompson

1969 Vladamir Nabokov presents concept of emoticon/emoji to New York Times

1969 Structured Writing and Information Mapping by Robert E. Horn

1969 ARPANET based on concepts developed in parallel with work by Paul Baran, Donald Davies, Leonard Kleinrock and Lawrence Roberts

1970

1970s Gyricon Electronic Paper by Nick Sheridon at Xerox PARC

1970 Xerox PARC founded by Jacob E. Goldman of Xerox

1970 IBIS (issue-based information system) conceptualised by Horst Rittel

1970 Journal by David A. Evans

1970 *Bomber* by Len Deighton, first published novel written with the aid of a commercial word processor, the IBM's MT/ST (IBM 72 IV)

1970 Daisy Wheel Printing by Andrew Gabor at Diablo Data Systems allowing for proportional fonts

1971 New York Times article refers to "the brave new world of Word Processing"

1971 Laser Printer by Gary Starkweather at Xerox PARC

1971 File Transfer Protocol (FTP) by Abhay Bhushan

1971 Project Gutenberg by Michael S. Hart

1971 Email with @ by Ray Tomlinson

1971 PUB scriptable markup language. Brainchild of Les Earnest of the Stanford Artificial Intelligence Laboratory and implemented by Larry Tesler

1972 TLG (*Thesaurus Linguae Graecae*) founded by Prof Marianne McDonald at the University of California, Irvine, to create a comprehensive digital collection of all surviving Greek texts from antiquity to the present era

1972 C programming language by Dennis Ritchie and Ken Thompson

1972 Xerox Star memo written by Butler Lampson, inspired by NLS

1973 Xerox Alto by Xerox PARC designed primarily by Charles P. Thacker

1973 Addison-Wesley replaces its mechanical typesetting technology with computerised typesetting

1973 Copy & Paste by Larry Tessler at Xerox PARC

1973 Click & Drag by Jeff Raskin at Xerox PARC

1973 Micral, first personal computer using a microprocessor by André Trương Trọng Thi, Réalisation d'Études Électroniques (R2E), (Orsay, France)

1973 Community Memory Bulletin Board precursor

1974 Omni-Font Optical Character Recognition System (OCR) Scanners by Ray Kurzweil at Kurzweil Computer Products

1974 Bravo word processor by Butler Lampson, Charles Simonyi at Xerox PARC. They would go on to produce Word

1974 *Computer Lib/Dream Machines* by Ted Nelson

1974 'Writing with light, writing on glass' were the closing words of Wilfred A. Beeching's Century of the Typewriter

1974 Transmission Control Protocol (TCP) an internet working protocol for sharing resources using packet switching among network nodes forming the foundation of the Internet (short for internet working)

1975 ZOG by Allen Newell, George G. Robertson, Donald McCracken and Robert Akscyn at Carnegie Mellon University

1975 Microsoft founded by Bill Gates and Paul Allen

1975 MUSA Speech Synthesis systems (MUltichannel Speaking Automaton) project led by Giulio Modena

1975 Altair 8800 computer by Ed Roberts and Forrest M. Mims III

1975 Gypsy document preparation system/word processor by Larry Tesler, Timothy Mott, Butler Lampson, Charles Simonyi, with advice from Dan Swinehart and other colleagues

1975 Colossal Cave Adventure text adventure game by Will Crowther and later expanded by Don Woods

1976 Second edition of *The Art of Computer Programming* by Donald Knuth, published by Addison-Wesley, which was typeset using phototypesetting which inspired him to develop TeX since he found the typesetting inferior to the original, Monotype typeset edition

1976 Frutiger series of typefaces by Adrian Frutiger

1976 Apple Computer (later Apple Inc.) founded Steve Jobs, Steve Wozniak and Ronald Wayne

1976 *The Metanovel: Writing Stories by Compute*r by James Meehan

1976 Emacs (Editor MACroS) word processor by David A. Moon, Guy L. Steele Jr. and Richard M. Stallman, based on TECO

1976 vi word processor by Bill Joy (now Vim)

1976 PROMIS (Problem-Oriented Medical Information System) by Jan Schultz and Lawrence Weed the University of Vermont

1977 Apple II computer by Steve Wozniak at Apple

1977 DataLand developed at MIT

1977 Zork interactive fiction computer game by Tim Anderson, Marc Blank, Bruce Daniels, and Dave Lebling at MIT

1977 Inkjet Printing by Ichiro Endo at Canon

1977 Preliminary Description of TEX Memo by Donald Knuth

1977 Name/Finger protocol (provided status on a particular computer system or person at network sites) by Harrenstien

1978 Aspen Movie Map, the first hypermedia/interactive videodisc by Andy Lippman, Bob Mohl and Michael Naimark of the MIT Architecture Machine Group

1978 Public dial-up BBS by Ward Christensen and Randy Suess

1978 TeX by Donald Knuth released as the first version which was used by others. Written in SAIL (Stanford Artificial Intelligence Language)

1978 American Mathematical Society Gibbs Lecture by Donald Knuth, *Mathematical Typography*; published in the Bulletin (New Series) of the American Mathematical Society, volume 1, 1979, pp. 337-372

1978 Vancouver Citation Style (author number), as a part of the Uniform Requirements for Manuscripts Submitted to Biomedical Journals (URMs)

1978 QuarkXPress desktop publishing software by Quark

1978 Earliest documented electronic Spam (although the term had not yet been coined) by Gary Thuerk

1978 LISA computer by Apple design starts, with a requirement for proportional fonts

1978 Speak & Spell by Texas Instruments

1978 Highlighters with fluorescent colours by Dennison Company

1978 Wordstar word processor by Rob Barnaby

1979 WordPerfect word processor by Bruce Bastian and Alan Ashton at Brigham Young

University

1979 Hayes Modem by Dennis C. Hayes and Dale Heatherington

1979 Metafont by Donald Knuth

1979 -) proposed by Kevin Mackenzie as a joke-marker precursor emoticon

1979 EasyWriter for Apple II by John Draper

1979 TV-EDIT word processor was used by Douglas Hofstadter to write ‘Gödel, Escher, Bach’

1979 Macintosh Project started by Jef Raskin and included Brian Howard, Marc LeBrun, Burrell Smith, Joanna Hoffman, and Bud Tribble. Named for Raskin’s favourite apple, the succulent McIntosh. He changed the spelling of the name to avoid potential conflict with the audio equipment manufacturer named McIntosh

1979 Post-Its® by 3M sold commercially

1979 Steve Jobs visited Xerox PARC, organized by Jef Raskin, as part of an investment agreement

1980

1980s SPAM used as a term to describe users on BBSs and MUDs who repeat it a huge number of times to scroll other users’ text off the screen. It later came to be used on Usenet to mean excessive multiple postings

1980 ZX80 by Sinclair

1980 Smalltalk designed by Alan Kay, Dan Ingalls, Adele Goldberg and developed by Alan Kay, Dan Ingalls, Adele Goldberg, Ted Kaehler, Diana Merry, Scott Wallace, Peter Deutsch at the Learning Research Group of Xerox PARC

1980 PC by IBM

1980 Imagen founded by Les Earnest, sold to QMS in 1987

1980 Floppy Disks become prevalent for personal computers

1980 Vydec1800 Series Word Processor by Exxon

1980 ENQUIRE proposed by Tim Berners-Lee

1980 USENET by Tom Truscott and Jim Ellis

1982–3 The Encyclopaedia Project by Alan Kay, Charles Van Doren, Brenda Laurel, Steve Weyer and Bob Stein at Atari Research Group

1981 Movie Manual by David Backer at the MIT Architecture Machine Group

1981 Raskin leaves the Macintosh project and Steve Jobs takes over

1981 BITNET, EARN and NetNorth network university IBM mainframes, allowing text (mail, files, chat) to be shared by non-Arpanet institutions

1981 TPS (Technical Publishing Software) by David Boucher at Interleaf, allowed authors to write text and create graphics WYSIWYG

1981 First major use of Information Murals in Organizations by David Sibbet

1982 Guide by Peter J. Brown at Canterbury University

1982 Adobe founded by John Warnock and Charles Geschke

1982 First ASCII emoticons :-) and :-(by Scott Fahlman at Carnegie Mellon University

1982 CD-ROM by Denon

1982 Tron movie released, the first movie written on a computer, an Alto at PARC. Written by Bonnie MacBird based on inspiration by Ted Nelson's Computer Lib with consultation from Alan Kay, whom Bonnie would later marry

1982 TeX82, a new version of TeX, rewritten from scratch, renaming the original TeX TeX78

1983 Viewtron by AT&T and Knight Ridder

1983 MILNET physically separated from ARPANET

1983 ThinkTank outliner for Apple II

1983 ARPANET switches to TCP/IP

1983 Lisa by Ken Rothmuller, replaced by John Couch with contributions from Trip Hawkins, Jef Raskin and Steve Jobs, at Apple

1983 Word word processor for DOS by Charles Simonyi and Richard Brodie for Xenix (Unix OS) and MS-DOS, at Microsoft. Originally called 'Multi-Tool Word'

1983 KMS (Knowledge Management System), a descendant of ZOG by Don McCracken and Rob Akscyn at Knowledge Systems (a spinoff from the Computer Science Department of Carnegie Mellon University)

1983 Hyperties by Ben Shneiderman at the University of Maryland

1983 Multi-Tool Notepad word processor by Richard Brodie at Microsoft

1983 '1984' Macintosh Television Commercial by Apple

1984 Literate Programming introduced by Donald Knuth, and approach to treat a program as literature understandable to human beings. Implemented at Stanford University as a part of research on algorithms and digital typography under the name WEB

1984 Macintosh launched. In addition to the original contributors, the team also included Bill Atkinson Chris Espinosa, Joanna Hoffman, George Crow, Bruce Horn, Jerry Manock, Susan Kare, Andy Hertzfeld, and Daniel Kottke

1984 MacWrite word processor included with Macintosh, by Randy Wigginton, Don Breuner

and Ed Ruder of Encore Systems for Apple. Also known as ‘Macintosh WP’ (Word Processor) and ‘MacAuthor’ before release

1984 The Print Shop designed by David Balsam and programmed by Martin Kahn at Brøderbund

1984 Metafont by Donald Knuth updated to a version still in use at the time of writing this book

1984 FidoNet bulletin board system software by Tom Jennings

1984 LaserWriter printer by Apple

1984 ‘Cyberspace’ term coined by William Gibson in Neuromancer

1984 Organizer by David Potter at Psion

1984 PostScript by John Warnock, Charles Geschke, Doug Brotz, Ed Taft and Bill Paxton at Adobe, influenced by Interpress, developed at Xerox PARC

1984 MacroMind founded by Marc Canter, Jay Fenton and Mark Stephen Pierce

1984 PC Jr desktop computer by IBM

1984 Notecards by Randall Trigg, Frank Halasz and Thomas Moran at Xerox PARC

1984 Highlighted Selectable Link by Ben Shneiderman and Dan Ostroff at University of Maryland

1984 TIES by Ben Shneiderman at University of Maryland

1984 LaserJet by HP

1984 Text Messaging / SMS (short message service) developed by Franco-German GSM cooperation by Friedhelm Hillebrand and Bernard Ghillebaert

1984 Filevision by Telos

1984 LaTeX by Leslie Lamport who was writing a book and needed macros for TeX, resulting in ‘Lamport’s TeX’ (‘LaTeX’)

1984 Zoomracks for Atari by Paul Heckel

1985 Symbolics Document Examiner by Janet Walker

1985 Guide, commercial edition, by OWL (Office Workstations Ltd)

1985 Pagemaker desktop publishing software by Aldus, bought by Adobe in 1994

1985 StarWriter word processor by Marco Börries at Star Division

1985 Intermedia by Norman Meyrowitz and others at Brown University

1985 Windows operating system spearheaded by Bill Gates at Microsoft

1985 Write word processor by Microsoft, included with Windows

1985 Word word processor by Microsoft ported to Macintosh

1985 Amiga computer by Commodore

1985 Emacs General Public License by Richard Stallman, the first copyleft license

1985 TRICKLE by Turgut Kalfaoglu at Ege University, İzmir; BITNET-to-Internet gateway allows sharing of text and programs between two disparate networks

1986 Guide by Peter J. Brown at the University of Kent, marketed by OWL

1986 Harvard Graphics desktop business application by Software Publishing Corporation

1986 Texinfo GNU Documentation System by Richard Stallman and Bob Chassell, developed by Brian Fox and Karl Berry

1986 FrameMaker document/word processor by Frame Technology. Developed by Charles 'Nick' Corfield based on an idea from Ben Meiry and commercialised with Steve Kirsch. Bought by Adobe 1995

1986 Hyperties commercial version by Cognetics Corporation

1986 Solid Ink Printing by Tektronix

1986 SGML (Standard Generalized Markup Language), ISO 8879

1986 Uncle Roger by Judy Malloy released on Art Com Electronic Network on The Well

1987 PowerPoint presentation software created by Robert Gaskins and Dennis Austin at Forethought Inc., bought by Microsoft same year and released as a Microsoft product 1989

1987 MacroMind Director multimedia authoring by MacroMind

1987 Storyspace by Jay David Bolter & Michael Joyce, maintained and distributed by Mark Bernstein of Eastgate Systems

1987 Unicode by Joe Becker from Xerox with Lee Collins and Mark Davis from Apple

1987 Franklin Spelling Ace by Franklin Electronic Publishers

1987 Apple Knowledge Navigator visionary concept video initiated by John Sculley, sponsored by Bud Colligan, written and creatively developed by Hugh Dubberly and Doris Mitsch with input from Mike Liebhold and advice from Alan Kay, inspired by the MIT Media Lab, with product design by Gavin Ivester and Adam Grosser at Apple

1987 TEI (Text Encoding Initiative) 'Poughkeepsie Principles': text encoding guidelines for Humanities texts

1987 HyperCard by Bill Atkinson at Apple

1987 Amanda Goodenough's children's point and click stories in Hypercard published by Voyager

1987 Hypertext'87 First ACM conference on hypertext

1988 Microcosm by Wendy Hall, Andrew Fountain, Hugh Davis and Ian Heath

1988 NeXT Cube by NeXT

1988 IRC by Jarkko Oikarinen

1988 # (hash) and & (ampersand) used in IRC to label groups and topics (RFC 1459)

1988 Wolfram Mathematica by Stephen Wolfram

1988 Hypertext edition of Communications of the ACM using Hyperties by Ben Shneiderman

1988 Idex by William Nisen of Owl, based on Guide

1988 *Hypertext Hands-On!* by Ben Shneiderman and Greg Kearsley, first commercial electronic book

1988 *Reflections on NoteCards: seven issues for the next generation of hypermedia systems* by Frank,G. Halasz

1988 Serial Line Internet Protocol (SLIP) by J. Romkey

1988 Breadcrumb Trail navigation metaphor in Hypergate by Mark Bernstein

1989 GRiDPad 1900, the first commercial tablet by GRiD Systems Corporation

1989 Robert Winter's CD Companion to Beethoven's Ninth Symphony, published by Voyager, the first viable commercial CD-ROM

1989 SuperCard by Bill Appleton at Silicon Beach Software

1989 gIBIS by Jeff Conklin and Michael Begeman, commercialised in the 1990s as CM/1 and QuestMap

1989 Bidirectional Email-to-Fax Gateway hosted by UCC

1989 Word for Windows word processor by Microsoft

1989 *Mapping Hypertext: Analysis, Linkage, and Display of Knowledge for the Next Generation of On-Line Text and*
Graphics by Robert E. Horn

1990

1990s T9 invented by Martin King and Cliff Kushler, co-founders of Tegic

1990s Compendium by Al Selvin and Maarten Sierhuis

1990 Archie, a tool for indexing FTP archives, considered to be the first Internet search engine, by Alan Emtage and Bill Heelan at McGill University/Concordia University in Montreal

1990 Python programming language by Guido van Rossum

1990 *The SGML Handbook* by Charles F. Goldfarb

1990 *Designing Hypermedia for Learning* by David H. Jonassen and Heinz Mandl (editors) in which updated conference proceedings are annotated by the authors with typed hypertext links in the margins connecting passages between the articles

1991 Gopher protocol by the University of Minnesota (initial version of the protocol appeared in 1991, codified in 1993 as a RFC 1436)

1991 *Seven Issues: Revisited* Hypertext '91 Closing Plenary by Frank G. Halasz at Xerox Corporation

1991 World Wide Web by Tim Berners-Lee becomes the first global hypertext system

1991 DocBook DTD by HaL Computer Systems and O'Reilly & Associates

1991 Camelot Project started as in at Adobe, later to become PDF

1991 PowerBook Laptops by Apple

1991 Aquanet by Catherine C. Marshall, Frank G. Halasz, Russell A. Rogers and William C. Janssen Jr.

1991 Visual Basic programming language by Microsoft

1991 Java programming language project launched by James Gosling, Mike Sheridan and Patrick Naughton. Originally called Oak, then Green, and finally Java

1991 Instant Update by ON Technology

1991 HTML by Tim Berners-Lee, influenced by SGMLguid, an in-house markup language at CERN

1991 CURIA (now CELT: Corpus of Electronic Texts) first corpus in Early Irish to be published on the World-Wide Web by University College Cork, Ireland

1991 Expanded Books Project by The Voyager Company

1991 TeachText by Apple, included with System 7

1992 First Text Message (SMS) is sent by Neil Papworth reading: "Merry Christmas" to Richard Jarvis at Vodafone

1992 Veronica a search engine system for the Gopher protocol by Steven Foster and Fred Barrie at the University of Nevada, Reno

1992 Lynx internet web browser by Lou Montulli, Michael Grobe, and Charles Rezac at the University of Kansas

1992 Frontier by Dave Winer at UserLand Software released on Mac

1992 OpenDoc by Kurt Piersol and Jed Harris at Apple. First code named 'Exemplar', then 'Jedi' and 'Amber'

1992 Palm Computing founded by Jeff Hawkins

1992 *The End of Books* By Robert Coover, Hypertext fiction cover story in the New York

Times Book Review

1992 Before Writing by Denise Schmandt-Besserat

1992 Portable Document Format (PDF) by Adobe

1992 BBEdit word processing software by Rich Siegel at Bare Bones Software

1993 Mosaic web browser by Marc Andreessen and Eric Bina at NCSA massively popularises the web

1993 Microsoft Word word processor celebrates its 10th anniversary with 10 million Word users

1993 Encarta multimedia encyclopedia by Microsoft

1993 Hypermedia Encyclopedias sell more copies than print encyclopedias

1993 Newton MessagePad PDA by Steve Sakoman, Steve Capps, Larry Tesler, Michael Culbert, Michael Tchao and others at Apple under John Sculley

1993 Early Blog by Rob Palmer

1993 Open Agent Architecture (OAA) delegated agent framework by Adam Cheyer et al. at SRI International

1993 Georgia typeface designed by Matthew Carter and hinted by Tom Rickner for Microsoft

1993 *Searching for the Missing Link: Discovering Implicit Structure in Spatial Hypertext* by Catherine C. Marshall and Frank Shipman. First occurrence of Spatial Hypertext in print

1993 AppleScript launched with System 7 by Apple

1994 PDF made freely available

1994 Links.net blog by Justin Hall, before the term would be used

1994 TrueType Open by Microsoft

1994 Point-to-Point Protocol (PPP) enabled internet communications between two routers directly by W. Simpson

1994 Netscape Navigator web browser by Jim Clark and Marc Andreessen at Netscape Communications Corp

1994 Scripting News by Dave Winer

1994 Yahoo! founded by Jerry Yang and David Filo

1994 Amazon founded by Jeff Bezos

1994 Semantic Web vision presented by Tim Berners-Lee at the first World Wide Web Conference

1994 QR Code System by the Japanese company Denso Wave, a subsidiary of Toyota

1994 World Wide Web Consortium founded

1994 PageMill HTML authoring by Seneca Inc., bought by Adobe one year later, discontinued 2000

1994 *VIKI: Spatial Hypertext Supporting Emergent Structure* by Catherine C. Marshall, Frank M. Shipman III, James H. Coombs

1994 *A Subversive Proposal* by Stevan Harnad at the University of Southampton

1995 WordPad word processor by Microsoft is included in Windows 95, replacing Write

1995 Netscape goes public and gains market value of almost $3B on first day of stock market trading

1995 The World Wide Web Handbook by Peter Flynn, first comprehensive book on HTML

1995 Ruby scripting langauge by Yukihiro 'Matz' Matsumoto

1995 Windows 95 operating system by Microsoft

1995 WikiWikiWeb, the first wiki, by Ward Cunningham

1995 Java public release by James Gosling at Sun Microsystems (since been acquired by Oracle), the first programming language to use Unicode for all text

1995 JavaScript by Brendan Eich at Netscape (orignally called Mocha, then LiveScript and later JavaScript)

1995 AltaVista founded by Paul Flaherty, Louis Monier, Michael Burrows and Jeffrey Black

1995 FutureSplash by FutureWave, sold to Macromedia in 1996 and renamed Flash

1996 Cascading Style Sheets (CSS) by Håkon Wium Lie and Bert Bos at the World Wide Web Consortium

1996 Palm OS PDAs including the Graffiti handwriting system

1996 Vaio laptop by Sony

1996 Cyberdog OpenDoc based Internet suite of applications by Apple

1996 OpenType by Microsoft joined by Adobe

1996 Anoto by Christer Fåhræus to provide digital pen capability to paper

1996 Hotmail email system by Sabeer Bhatia and Jack Smith, bought by Microsoft in 1997

1996 The Internet Archive by Brewster Kahle

1996 GoLive HTML authoring software by GoNet Communication, Inc., bought by Adobe 1999

1996 TextEdit word processor by Apple. Not meant for use, it was sample code

1996 Live word count by Keith Martin, demonstrated in the Wordless word processor, later appearing in Microsoft Word 98

1997 Emoji developed by Japanese mobile operators during the 1990s including SoftBank and Shigetaka Kurita for i-mode

1997 Meta Content Framework developed by Ramanathan V. Guha at Apple Computer's Advanced Technology Group, leading to RDF

1997 OpenDoc by Apple cancelled

1997 Apple Data Detectors by Jim Miller, Thomas Bonura and others at Apple's Advanced Technology Group, which would also lead on to LiveDoc

1997 Resource Description Framework (RDF) derived from W3C's PICS, Dublin Core and from the Meta Content Framework (MCF) developed by Ramanathan V. Guha at Apple and Tim Bray at Netscape

1997 Dreamweaver HTML authoring software by Macromedia, bought by Adobe 2005

1997 Yandex by Arkady Volozh and Ilya Segalovich

1997 Flash multimedia authoring and platform by Macromedia, later bought by Adobe

1997 'weblog' term coined by Jorn Barger to describe a log of his internet activity

1997 Jabberwacky released online by Rollo Carpenter

1997 E-Paper by Barrett Comiskey, Joseph Jacobson and JD Albert at E Ink Corporation

1997 Newton PDA by Apple cancelled after Steve Jobs return

1997 Unistroke by David Goldberg at Xerox PARC

1997 9000i Communicator monile phone by Nokia, the first mobile phone with a full keyboard

1997 OpenType by Microsoft

1997 Liquid Mail email system by Frode Alexander Hegland featuring smart Views

1998 iMac desktop computer by Apple

1998 First blog published on an established news site by Jonathan Dube at The Charlotte Observer

1998 *Can Computers Think? History and Status of the Debate*. Seven posters. Industrial strength argumentation map by Robert E. Horn

1998 Open Diary blogging service by Bruce Ableson

1998 Visual Language: Global Communication for the 21st Century Robert by E. Horn

1998 (possibly 1999) Fluid Links demo video at the ACM CHI conference by Polle T. Zellweger, Bay-Wei Chang, and Jock D. Mackinlay

1998 'SPAM' in The *New Oxford Dictionary of English*

1998 Google founded by Larry Page and Sergey Brin

1998 XML 1.0 becomes a W3C Recommendation

1998 Netscape goes open source with the name Mozilla

1998 XML-RPC text-based networking protocol between apps running across operating systems

1998 Frontier blog software by Dave Winer at UserLand Software released on Windows

1998 MathML by W3C

1998 @font-face by W3C

1998 AOL buys Netscape for $4 Billion

1999 Open eBook

1999 The short form, ‘blog’, was coined by Peter Merholz. Shortly thereafter, Evan Williams at Pyra Labs used ‘blog’ as both a noun and verb and devised the term ‘blogger’ in connection with Pyra Labs' Blogger product, leading to the popularization of the terms

1999 LiveJournal blogging service by Brad Fitzpatrick at Danga Interactive

1999 Blogger blogging service by Evan Williams and Meg Hourihan with significant coding by Paul Bausch and Matthew Haughey

1999 RDF Site Summary (RSS 0.9) the first version of RSS, by Dan Libby and Ramanathan V. Guha at Netscape

1999 RSS 0.91 by Dave Winer at UserLand

1999 my.netscape.com and my.userland.com

1999 Edit This Page by Dave Winer

1999 *Code and Other Laws of Cyberspace* by Larry Lessig

1999 Mac OS X operating system by Apple

1999 Ajax web development techniques for asynchronous web applications emerges

1999 *ActiveText: A Method for Creating Dynamic and Interactive Texts* by Jason E. Lewis and Alex Weyers at Interval Research Corporation

1999 *Spatial Hypertext: An Alternative to Navigational and Semantic Links* by Frank M. Shipman and Catherine C. Marshall

1999 Electronic Literature Organization (ELO) founded by Scott Rettberg, Robert Coover, and Jeff Ballowe

2000

2000 Optical Character Recognition (OCR) software is made available online for free

2000 1 billion indexable pages on the Web, estimated by NEC-RI and Inktomi

2000 ClearType by Microsoft

2000 XML Linking Language (XLink) an XML markup language for creating internal and external links within XML documents, and associating metadata with those links, by Steven DeRose, Eve Maler, David Orchard and Bernard Trafford

2000 EPrints by Stevan Harnad, funded by Wendy Hall, supervised by Les Carr and implemented by Rob Tansley and others at the University of Southampton

2000 CoolType by Adobe

2000 ScholOnto by Simon Buckingham Shum, Enrico Motta and John Domingue at the Knowledge Media Institute, The Open University. This evolved over the next decade into ClaiMaker and Cohere with Victoria Uren, Gangmin Li, Anna De Liddo and Michelle Bachler

2000 *Riding the Bullet* by Stephen King, the first mass-market e-book for encrypted download

2000 EverNote founded by Stepan Pachikov

2001 'Chinese General Language and Character Law' rolled out.

2001 Tinderbox by Mark Bernstein, Eastgate Systems

2001 Semantic Web vision popularised in a Scientific American article by Tim Berners-Lee, James Hendler and Ora Lassila

2001 G4 Titanium PowerBook laptop computer by Apple

2001 *The Wiki Way* by Bo Leuf and Ward Cunningham

2001 Creative Commons by Lawrence Lessig, Hal Abelson, and Eric Eldred

2001 Wikipedia online collaborative encyclopedia by Jimmy Wales and Larry Sanger at Nupedia

2001 Movable Type weblog publishing system by Benjamin Trott and Mena Grabowski Trott at Six Apart

2001 JSON by Douglas Crockford

2001 Douglas Adams' speech about Virtual Graffiti held at the 3GSM World Congress

2002 Bibliotheca Alexandrina founded, the modern Library of Alexandria, with Ismail Serageldin as the founding director

2002 EPrints version 2 lead developer Christopher Gutteridge

2003 Android Inc founded by Andy Rubin, Rich Miner, Nick Sears, and Chris White

2003 Friendster social media service Jonathan Abrams

2003 Myspace blogging and social media service by Brad Greenspan, Josh Berman and Tom Anderson at eUniverse

2003 *Deep Love* by Yoshi, first cell phone novel (Japanese 'Keitai Shousetsu')

2003 The Legal Deposit Libraries Act widens the definition of what publishers should send to the libraries to include digital publications, pending further regulation

2003 WordPress blogging service by Matt Mullenweg and Mike Little

2003 Blogger blogging service is bought by Google

2003 TypePad blogging service by BizLand, later Endurance International Group (EIG)

2003 Ulysses word processor by Max Seelemann and Marcus Fehn

2004 Facebook social media service by Mark Zuckerberg, Eduardo Saverin, Andrew McCollum, Dustin Moskovitz and Chris Hughes

2004 First hypertext format full length articles accepted at ACM's Hypertext Conference with *Twin media: hypertext structure under pressure* by David Kolb awarded 'Best Paper'

2004 First hypertext format article at ACM's Document Engineering conference by James Blustein and Mona Noor

2004 Institute for the Future of the Book founded by Bob Stein

2004 Tag Cloud at Flickr, Technorati, WordPress Plugins and more

2004 Scala programming language by Martin Odersky

2005 Pages word processor by Apple

2005 Markdown by John Gruber collaboration with Aaron Swartz

2006 Time Person of the Year is 'You'

2005 Writely by programmers Sam Schillace, Steve Newman and Claudia Carpenter at Upstartle

2006 Upstartle bought by Google

2006 Google Docs by Google

2006 Twitter social media service founded by Jack Dorsey, Noah Glass, Biz Stone and Evan Williams at Twitter

2006 One Laptop Per Child by Nicholas Negroponte

2006 HyperScope Project by Doug Engelbart and Brad Neuberg, Eugene Kim, Jonathan Cheyer and Christina Engelbart

2006 Hyperwords Project by Frode Hegland, Fleur Klijnsma and Rob Smith

2006 Office Open XML by Microsoft

2006 *The Semantic Web Revisited* by Tim Berners-Lee, Nigel Shadbolt, and Wendy Hall, in IEEE Intelligent Systems

2006 Debategraph by Peter Baldwin and David Price

2006 *Gamer Theory* by McKenzie Wark's, the first networked book, produced by the Institute for the Future of the Book

2006 *Dialogue Mapping: Creating Shared Understanding of Wicked Problems* by Jeff Conklin

2007 Hashtag by Chris Messina (name by Stowe Boyd)

2007 iPhone by Apple Inc.

2007 Kindle by Amazon

2007 Scrivener for macOS by Keith Blount at Literature & Latte

2007 EPUB by IDPF

2008 MacBook Air by Apple

2008 Last Stable Build of Netscape Navigator

2009 Like Button by Facebook

2009 Webfonts by Typekit

2009 OmmWriter by Herraiz Soto & Co

2009 iPhone Copy & Paste by Apple

2009 Twine open-source tool for authoring interactive fiction by created by Chris Klimas

2010

2010 Thumbs Up Emoji

2010 Retina Display by Apple

2010 iA Writer word processor by Oliver Reichenstein

2010 iPad tablet by Apple

2010 Swift programming language development by Chris Lattner, with the eventual collaboration of many other programmers at Apple

2010 Siri developed by Dag Kittlaus, Tom Gruber, and Adam Cheyer, bought by Apple

2010 Emoji ratified as part of Unicode 6.0

2011 iMessage by Apple

2011 ByWord word processor by Metaclassy

2011 Scrivener word processor for Windows by Keith Blount at Literature & Latte

2011 Annual Future Of Text Symposium by Frode Alexander Hegland launched

2011 Liquid text utility by Frode Alexander Hegland at The Liquid Information Company

2011 Siri personal digital assistant released as part of the iPhone 4S by Apple

2011 Swype by Cliff Kushler allying users to drag their fingers on a virtual keyboard to connect the dots between letters

2011 ClaiMaker by Gangmin Li, Victoria Uren, Enrico Motta, Simon Buckingham Shum and John Domingue

2012 Knowledge Graph by Emily Moxley, Google's lead product manager, at Google

2012 Muse by Adobe

2012 *The Web-Extended Mind* by Paul Smart

2012 *Inventing on Principle* presentation by Bret Victor

2012 Google Now Assistant launched by Google

2012 Medium online social publishing platform by Evan Williams

2012 LiquidText by Craig Tashman

2012 Outlook by Microsoft replaces Hotmail

2013 Non-Print Legal Deposit Regulations further define the digital elements of the Legal Deposit Libraries Act and lead to large-scale on-going transfer of e-journals and e-books to the legal deposit libraries for posterity

2013 First Full-Scale Harvest of the UK Domain by the UK Web Archive, using the Non-Print Legal Deposit Regulations

2013 Ulysses III (major rewrite) by Max Seelemann and Marcus Fehn

2014 Xanadu by Ted Nelson

2014 Alexa assistant released by Amazon

2014 Cortana assistant released by Microsoft

2014 Framtidsbiblioteket (The Future Library project) launched, a public artwork that aims to collect an original work by a popular writer every year from 2014 to 2114

2014 Author reboot by Frode Alexander Hegland at The Liquid Information Company with coding by Jacob Hazelgrove

2014 Most up to date version of TeX is 3.14159265 as of the publication of this book

2014 Swift programming language launched at the Apple Worldwide Developers Conference (WWDC)

2014 Author early release by Frode Alexander Hegland at The Liquid Information Company

2014 Augmented Writing by Textio

2015 Notion by Ivan Zhao at Notion Labs

2015 Watch by Apple

2015 Hamilton musical, by Lin-Manuel Miranda, makes it Broadway debut, highlighting the beauty and power of the written word, with an opening line stating that Hamilton "put a pencil to his temple, connected it to his brain"

2016 Reactions, also-called Tapback, for iMessage by Apple

2016 Universal Clipboard by Apple

2016 Viv Labs, developed by Dag Kittlaus, Adam Cheyer and Chris Brigham, acquired by Samsung

2016 Notion founded by Ivan Zhao and Simon Last

2017 Roam Research founded by Conor White-Sullivan

2017 Web Annotations Standardised by the W3C Web Annotation Working Group

2018 Bixby Marketplace, an open assistant ecosystem based on Viv Labs Technology, launched by Samsung

2019 Reader PDF viewer with Visual-Meta support by Frode Alexander Hegland at The Liquid Information Company with coding by Jacob Hazelgrove

2020

2020 Muse by Adobe discontinued

2020 Flash by Adobe discontinued

2020 iPad Keyboard with Trackpad by Apple

2020 Adobe Liquid Mode for Easier PDF Viewing on Mobile Devices powered by Sensei Machine Learning

Future

2023 (Jan 1), Adobe Type 1 (Postscript) fonts reach end of life; no further support in Adobe products (other software unaffected)

unknown The “absolutely final change (to be made after my death)” of TeX will be to change the version number to π,

at which point all remaining bugs will become features. Likewise, versions of Metafont after 2.0 asymptotically approach e (currently at 2.7182818), and a similar change will be applied after Knuth’s death.

unknown All the pioneers of digital text will die, leaving it to future generations to rediscover and hopefully improve upon how we interact with our textual knowledge, and each other.

unknown You will read this. What will you do with what you have learnt in this book, what will you think of the way we

saw text in 2020, how do you think the way we present and interact with text can be improved?

Contributors

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Sources & Suggested Reading

To delve into the stories the list on the previous pages only hint at, we suggest the following literature (early list):

Paratext

Margins & Marginality *by* Evelyn Tribble

Aspects of Text

The Mind on Paper *by* David R. Olson
Thinking on Paper *by* V.A. Howard and J.H. Barton

Textual Infrastructures

Metadata *by* Richard Gartner

Effects of Text

The Gun, The Ship & The Pen *by* Linda Colley

Deep History

Origins *by* Lewis Dartnell

Postscript : On Timelines

Note on the complexities of simple things such as a timeline

The composition of a timeline is never as easy as it may look. Much depend on purpose, perspective and scale– and of the very understanding of the word, the phenomenon referred to and the question whether it is the idea or concept, an instance of an idea or a phenomenon, a process or an event.The timeline may focus on peaks or it may focus on first appearances/ occurrences/manifestations, or both.This is further complicated since both the phenomena; their names and their meanings may change over time.Former meanings may become redundant or they have to accommodate to and coexist with new meanings. The time and place of the composition of the timeline is to be considered in interpreting the things listed.

A main function of timelines is to provide an overview over a longer history, it is a kind of mnemotechnic device.The entries in the timeline should be brief and indisputable. Therefore, timelines often identify the first occurrences' rather than most widespread or most qualified instances leaving the fuller and more complex and possibly disputable story out. But even first occurrences are often difficult to establish. The first occurrence is most often only the first finding of an instance.One cannot leave out that older instances will be found at a later time. This is also often the case in the history of text.

The notion 'text' can be found way back in the middle ages used for the main body of a manuscript as distinct from additional notes and illustrations.Later, it was applied to printed texts, as in textbooks, rather than written manuscripts. In 20th century linguistic theory maintains the use of text for linguistic expressions (sometimes expanded to include spoken, recorded expressions), while in literary theory the notion is both expanded to include all sorts of sequential expressions (multimedia) and dissolved (in intertextuality, and in reader interpretations). Which aspects of this broad - and far too short - story should be included? The word text furthermore overlaps wordings as script, writing, document, linguistic expression, and so forth. A History of Text timeline thus depends on both explicit and implicit ideas of the everchanging notion 'text' and related wordings.

The notion of text does not depend on a particular material form neither concerning production, storage, reproduction, dissemination nor concerning reception. During the 20th century it was often modelled as abstraction of characteristics of printed text, and the history of text is to a very high degree influenced by the material dimensions. Take as example the physical dissemination of texts which have been influenced both by new – not least mechanical and electrical – means of transportation, and most often accompanied by

developments of new genres. If we list the first modern newspaper (daily circulated) one might suggest that the ‘forerunners’ of weeklies or non-periodic news media should also be listed.

Even if it seems possible to list the major material innovations in the history of text the question becomes more intriguing when it comes to genres. The notion of genre is extremely difficult to define, but it is needed for our orientation in the huge universe of texts. Novels, short stories, poetry, drama, audio and video genres etc. The issue of genre is complicated for at least two reasons.To identify a genre always take more than one instance, usually a series of texts sharing a set of – eventually also changing – characteristics. It is a relational term. The second reason is that the same text often can be included in a hierarchy of genres as well as in a set of network relations to other texts. We may for some purposes distinguish between media which can be identified as materiel conveyors of content (shared physical characteristics of a set of texts) and genres which can be identified only by looking into the content (shared meaning characteristics of a set of texts).

Of course, opening for genres opens foran endless number of issues which is maybe more relevant within the humanities than in the sciences. However, where you have text you have troubles be it in the humanities or the sciences.

Today, text has also become a verb, to text a message which on the one hand marks the arrival of a new medium for text, but referring only to a very particular instantiation of digitaltext as written and possibly real time interactive network communication rather than longer documents. This again leads to ambiguities of what is meant by ‘digital text’, when did it come into existence? Did it originate as a new idea?Or was it rather a renaming of something already manifested? An unforeseen invention only recognized at a later time? While such issues can be discussed at length a timeline need some sort of decision. For digital text the basic issue is whether the text referred to is a digital copy or simulation of older texts or the notion refers directly to the sequences of bits. Both meanings make sense, though they have quite different implications. While the first sense restricts the notion to the visual screen level, the second may include all sorts of manifestations in the binary alphabet, independent of visual appearance, and in which both the Latin alphabet, other alphabets, musical scores, speech and images as well as the lay out machine instructions and a wide range of processes, scripts, instructions and programs are manifested.

The two notions of digital text (or e-text/electronic text) are both closely related to the notion of hypertext. The first type, digitized text can only be accessed by help of the hypertextual characteristics of all digital media:The document is opened by help of a link to a destination and a command telling what to do at the destination.Hypertext is used for navigating and searching in the document, but is not part of its content. The second type may

incorporate hypertext as part of the textual content. Thus hypertext both connect and complicate the relation between digital texts. But when did the phenomenon, hypertext, itselfcome into existence?

There is no doubt that Ted Nelson' notion of hypertext is considered to be the first articulation of the term.Still, the feature 'mechanical linking' was already there, included for instance in Paul Otlet's*Mundaneum* (1934), in Vannevar Bush' idea of a 'Memex' (1945).Similarly, the use of optional choice of the next step formed the basis for Alan Turing's notion of the universal computer as a choice machine(1936). Furthermore, the later history includes quite different notions of hypertext than Ted Nelsons (e.g. the www protocols (Berners Lee, 1989). This is also the casefor the use of links as intrinsic part of a text Michael Joyce (1988, 1990) and not simply as neutral connection between elements of the text or as a relation between texts. Actually, the French author Gerard Genette used the same word for a particular type of relation between texts, one text (denoted hypotext) was used as template for a later text (Genette, *Architext* 1979). According to Genette James Joyce's *Ulyssees* was a hypertext because it used the Homerian Odysseus as its hypotext. In the case of (digital) hypertext one might say that the 'firstness'of Ted Nelson's notion of Hypertext is that of the coinage of the word, and connected to his particular – and very influential – interpretation rather than the whole array of hypertext definitions and phenomena referred to before and after his coinage of the term.

The delimitation of hypertext is also tricky because the fundamental feature, the mechanical, coded and editable connection between an anchor and a destination is identical with the very basic architecture of any computational device which is based on the connection between input device and the storage consisting of an address and some sort of stored content to be found at the address accompanied by a command of what to do at that adress. The relation is often hidden behind the concept of the computer as a logical or computational device, and sometimes also hidden in the description of the binary alphabet as a logical set or as a conditional 'if then' rather than as binary alphabet - but it is precisely this feature which brings the computer-tech as such into the foreground in the history of text.

"Claims about the actual starting point of a field of study are notoriously inexact" wrote Sergei Nirenburg and Yorick Wilks in their 1987-paper on the development of the field of Machine Translation. At the time the starting point was often assumed to be Warren Weaver's idea, first presented in a personal mail to Norbert Wiener (1947) and later as a Memorandum called"Translation" circulated in 1949. However, they added, there was evidence that "Some work on mechanical translation preceded the Weaver memorandum. Not only did Booth and his colleagues start such work in Britain in 1946, but several patent applications were filed in the 1930s for translation devices, including very ingenious ones by the Soviet engineer

Smirnov-Troyansky."As early as 1948 Andrew Booth and Richard Richens had established a MT-lab at London University. Later it became clear that the Soviet Engineer Petr Petrovitch Smirnov-Troyanski (1894-1950) and others had worked on machine translation since 1933. His work is discussed in John Hutchins and Evgenii Lovtskii.'Petr PetrovichTroyanskii (1894-1950): A Forgotten Pioneer of Mechanical Translation.' *Machine Translation*. Vol. 15, No. 3 (2000), pp. 187-22. Who then, should be included in a time line of the history of text? It may be argued that Warren Weawer was the one who spread the idea of Machine Translation and made it grow, but he was not a founding father. Booth came first in the west. It may also be argued that Smirnov-Troyanski had no influence on the early development in the years prior to his recognition in the West in the late 1950-es. Still, he is the first known researcher in the rising field of Machine Translation.

This brief history of the starting point of Machine Translation illustrate the development of science towards a more global scope. Thus it also illustrates a very basic question concerning timelines: what part of the history is to be indexed? Smirnov-Troyanski's work in the 1930-es was not known in the west. But similar stories can be told also in other areas. In many years it was assumed that the use of movable types to print was an invention of Johan Gutenberg in the mid 15th century, but use of movable types was found in Korea and China around the 11th century or before. For a History of Text timeline it also raises the issue which alphabets are to be included or whether the timeline should be delimited to focus on alphabetic texts whether written, printed or digitized? Since digital media transcend and transform these borderlines into editable distinctions, it will be difficult to maintain a clear exclusion of other sorts of texts. For digital texts the question will always be which parts of the binary sequences belong to the text and which do not? For the History of Text timeline the question is to identify major trajectories to be pursued if the timeline should be further developed. To those indicated above one might also want to include the communication networks throughout history from the Egyptian postal system (known from 2000 B.C.) through the four major European networks of the middle ages (the communication networks of the church, the kings and nobles, the merchants, and wandering groups of musicians, beggars, actor troupes) to the modern system of newspapers, postal services, phone-services, cable networks, broadcast and streaming services and the global internet.

Niels Ole Finnemann

Postscript : Digital Text

Sometime in the Fall of 1954, Douglas Ross wrote his name–in freehand–into a computer using “a bright, glowing displayed spot of blue-white light, about 1/4 inch square” [1] hunched over a 16 inch oscilloscope called the ‘Area Discriminator’. This may well have been the first entry of interactive text into a computer where by ‘interactive’ I mean that it could later potentially be moved, deleted, changed the visual appearance of and more. At the time the term was ‘manual intervention, shortened to ‘MIV’. Two years later write a memo suggesting the use of an electrically-controlled typewriter, specifically a Flexowriter for text input.

Alas, this exciting description of the first moment of interactive text turns out not to be the first moment, though it may be the first moment text was entered freehand. Alan Kay, who knew Ross, questions his assertion (via private email) and Ivan Sutherland, who would go on to create the hugely innovative Sketchpad, commented—also via private email: “I don’t know. It was certainly well before Sketchpad. Program text has been in digital form since the very early days of computing. But how that text was ‘displayed’ may have been only on paper via a teletype machine or electrically controlled printer. Visual editing on a display system as opposed to a printer also pre-dates Sketchpad. So called WYSIWYG editing was done early I can suggest only our dead colleagues for more information (or a library)”.

However what we do know is that in the Barta Building on MIT’s Cambridge campus, at some point towards the end of 1949, a 5 inch laboratory CRT flickered alive and the first digital text appeared on the first real-time interactive computer, the Whirlwind, shining in an array of 256 by 256 dots [3]. The designer was by Jay Forrester and it is therefore likely he who entered the first text, but this has not been recorded.

Basic web search for subsequent dates of digital text history are easy to find, such as the first use of the term ‘digital’ {coined by Bell Labs researcher George Stibitz in 1942}, Doug Engelbart’s epiphany: “Boy, the world is complex, jeez, the problems are getting more complex and urgent and have to be dealt with collectively—we have to—deal with them collectively” {1951} Ted Nelson coining the term ‘hypertext’ {1963}, Doug Engelbart’s ‘Mother of all Demos’ {1968}, the first sending of a text message {December 3rd, 1992}, launch of the web {1991} and so on.

Not so for the very first glow of that screen–the very first spark of digital text–the exact first moment we entered symbolic text into a digital system. This moment is as lost in time as much as when the very first time our ancestor made a purposeful mark. At this moment magic

(of the Arthur C. Clarke ‘Third Law’ type) was unleashed on the world.

The early days of digital text are not behind us however. We still have serious limitations with how we can interact with our text and serious issues with addressing and citing. As we have moved into an era of digital-first documents, we have introduced more connectivity but also more brittleness-when servers go down or DNS fails to resolve, connections are lost. We can, and must, invent a better Future of Text: https://futuretextpublishing.com

Glossary

"Augmented Glossary" is a function enabled by Visual-Meta where Author adds a heading called ‘Glossary’ at the end of their document and adds paragraphs of text where the term to be defined is in bold in “double quotes” and and the Visual-Meta carries a list of glossary terms in order to overcome the lack of structure on PDF documents.

When the document is exported to PDF with Visual-Meta and opened in Reader, a user can, as normal select any text in the body of the document and do cmd-f to change the view to only show lines with the selected text.

However, if this text is in bold in the Glossary, the paragraph it appears in will appear at the top of the screen in full, under a heading ‘Glossary’ and with a diving line before all the other Find results, as mocked up below. If more than one paragraph has bold text which matches the search term, they will also be shown. I believe this is the simplest (or at least a very simple) implementation which could be useful for a reader and very simple for an author to create. The author can easily create and copy from an old document to a new document or from a ‘Glossary’ document and edit/add to as they see fit and the reader can choose to read the Glossary in full or see items as they come across terms the would like to look up.

Note: This glossary for this paper is the first time this has been tried and it is a result of many years of ‘dabbling’ with glossaries implementations using blogs and Liquid and other means, as I have noted in over 100 blog entries:

http://wordpress.liquid.info/?s=glossary

This is a/an concept, capability.

"Augmented Text" is a term which can be used in reference to the work of Doug Engelbart and other pioneers, in how they augmented digital text by providing the user with means through which the user can interact with the text in ways not possible in pre-digital substrates. I coined the term ‘augmented text’ to link the notion to the work of Doug Engelbart and his ‘’NLS/Augment’ system, to differentiate the idea of ‘hypertext’ which has become near-synonymous with ‘linking’ and because the current state of the art of being able to copy text, perform spell-check and a few other uniquely digital capabilities, such as ‘undo’ has become the neutral background onto where further text augmentations can take place.

This is a/an concept, capability.

"Augmented Views" is a term for several capabilities:

- Find other occurrences of typed in or highlighted text, by doing Cmd-f which results in a view of only the lines of text in the document which contents the text. If the text is also a term in the glossary, the glossary definition will appear on top of the Find results, giving the reader further information without the reader needing to learn additional commands. cmd-f again or ESC to close this view.
- Fold Documents to only see headings in an instant Outline in Author or Reader. cmd -
- In-Body Citation Click. Click on a citation in the document body and a pop-up menu appears, showing the References information which the user can use to dismiss the citation, accept its validity or view the source document. If the user chooses to view the document, the system will first search the user's local storage and open the document (if not found, there will be an option to search online) to the cited location. [Reader only]
- Headings & Names ('n') view [Reader only]
- Headings & Highlighted ('h') view [Reader only]
- Dynamic View. On cmd-d the word processing view is replaced by a non-linear 'Dynamic View' which the user can add any text to. Double click on any text in this view presents a Find list of any occurrences in the document. [Reader only at this point]

This is a/an capabilities, software function.

"Doug Engelbart, Doug, Douglas Carl Engelbart, Douglas Engelbart" Doug was my friend and mentor.

He was a seminal figure in the history of interactive computing.

Overview of his approach: http://futureoftext.org/doug-engelbart.html

This is a/an person.

"Visual-Meta" A method of adding metadata in a document as an appendix on the same visual level as the body of the document, in the BibTeX and JOSN formats, to allow the reader software to provide rich interactions, in a robust manner.

This is a/an infrastructure, concept.

project site: http://visual-meta.info

References

[1] Ross, D., *Proceedings of the ACM Conference on The History of Personal Workstations*. 1986. New York, NY, USA.
DOI: 10.1145/12178.12180.

[2] Anon, *Timeline of Computer History*. 2019.
From https://www.computerhistory.org/timeline/computers/. [Accessed 18 12 2019].

[3] C, K. & Smith, T., *Project Whirlwind. A case history in contemporary technology*. 1975.
From https://archive.org/details/bitsavers_mitwhirlwirlwindACaseHistoryInContemporaryTechnolo_14582082/page/n1. [Accessed 19 12 2019].

Visual-Meta

@description {
This appendix to the document is called Visual-Meta. The purpose is to add useful metadata to the document in order that the reader software can provide useful interactions to the user, such as letting the user copy as citation, fold the document into a table of content and more.
It is based on the academic BibTex citation information standard in LaTeX with added (optional) JOSN to describe the document you are reading, in order to enable rich interactions which are otherwise stripped from the document when exported to PDF or other delivery documents.
The way reader software looks for Visual-Meta in the PDF is to parse it from the end of the document and look for the @{visual-meta-end} tag. If this is found, the software then looks for the @{visual-meta-start} tag and uses the data found between these marker tags.
The introductory section, @visual-meta, specifies which version of Visual-Meta is used, followed by what software generated the Visual-Meta. This can be the software which created the document: 'generator' or software which appended the Visual-Meta onto the back of a previously created document, which would be labeled 'appended by'. For example, our 'Reader' application looks for a DOI on the first page of the document if no Visual-Meta is found, and asks the user for permission to resolve the DOI into a BibTeX entry which can be inserted into the document.
The first informational section is usually prefaced by @article for articles/papers or @book for books. The difference is useful to determine how to display the document, for example, in our 'Reader' software @book opens to a single front page in full screen. This section further includes standard BibTeX information which should be appended to the clipboard/copy space when copying any text from the document, in order to allow the software–for example a word processor–the user pastes into to paste as a full citation, which the software can then automatically list in a Reference section on export.
> The above is core and the following is optional <
The @headings section is in the <json> format and specifies what text in the document is a heading, what level heading it is as well as the name of the author for that section, if the section was authored by someone else than other than the main document, in the following way{"name":"Heading "Name, "level":"level2, "author":"Author "Name}. This is valid until a following section is marked as being authored by someone else.
This information should also be added when copying text from that section, to allow the pasted citation to correctly cite the author.
@glossary This sections lists what terms are in the glossary.
Feel free to add your own tags but please describe them in this introduction section in order for others to derive value from them now and in the future.
This was written March 2021 by Frode Alexander Hegland. More information is available from https://visual-meta.info or from emailing frode@hegland.com Visual-Meta was initially implemented in the 'Author' word processor and the 'Reader' PDF viewer: https://www.augmentedtext.info
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@glossary{
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 "Augmented Views",
 "Doug Engelbart, Doug, Douglas Carl Engelbart, Douglas Engelbart",
 "Visual-Meta"
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