

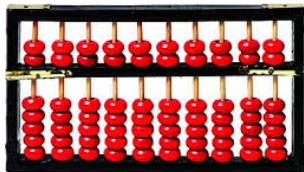
# Dele af datalogiens historie

DM534

Rolf Fagerberg

# Teknologi

2000 BC



Kugleramme (abacus)

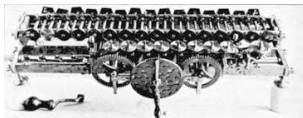
1642 AD



Pascals mekaniske  
additionsmaskine

# Teknologi

1673



Leibniz' mekaniske  
maskine til plus, minus,  
gange, dividere

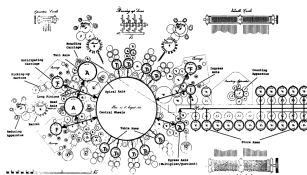
1801



Jacquards programmerbare  
væv med hulkort

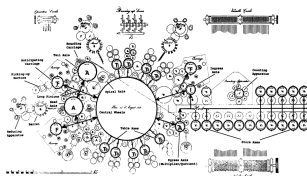
# Teknologi

1837 (udtænkt)



Babbage's "analytical machine"  
General-purpose, programmerbar,  
digital, med hukommelse, input  
og output

1837 (udtænkt)



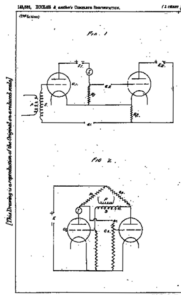
Babbage's "analytical machine"  
General-purpose, programmerbar,  
digital, med hukommelse, input  
og output

1907



De forest's radiatorer –  
strøm kan styre strøm.  
Heraf kan bygges logiske  
gates (AND, OR, ...).

1918



Første elektroniske flip-flop  
(1-bit hukommelse),  
Eccles-Jordan

Alle teknologier og ideer nødvendige for at lave en general-purpose, programmerbar, digital, elektronisk computer nu til stede.

# Teknologi

Men beregningsmaskiner var stadig mekaniske, specialiserede (og i nogle tilfælde analoge) i 1930'erne (og stadig i brug langt efter).

1931



MIT Differential Analyzer  
(Vannavar Bush)

# Teknologi

De første general-purpose, programmerbare, digitale computere: 1941 (delvis elektromekaniske) til 1948 (fuldt elektronisk, program i hukommelse).

Eksempler:

1941

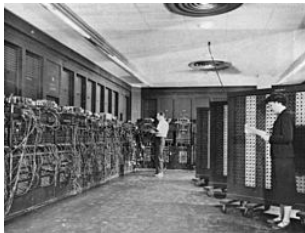


Konrad Zuse's Z3



# Teknologi

1946



ENIAC, Univ. of  
Pennsylvania

1948



Manchester Univ. "Baby"

# Teknologi

1947



Transistor (Bardeen, Brattain,  
Shockley)

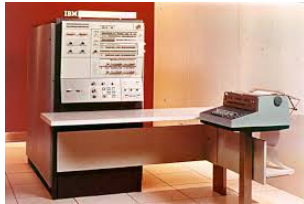
1958



Integrated circuits (Kilby)

# Teknologi

1960-nu



Mainframes (her IBM 360)

# Teknologi

1960-nu



Mainframes (her IBM 360)

1974-nu: Personlige computere.

Her: Altair, Apple I, Apple II, Commodore PET, ZX80, IBM PC (1981).



# Teknologi

1964



Engelbart's mus

1975

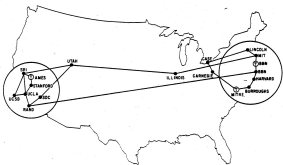


Xerox PARC Alto

1980-nu: laptops, tablets, smartphones, spillekonsoller.

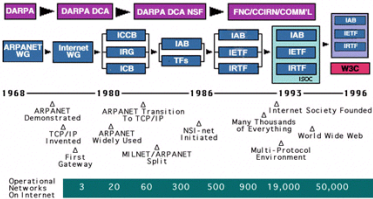
# Teknologi

1969



## ARPANET

Senere



## Internettet

# Teori

- ▶ 300 BC: Euclids algoritme (analyse 1844 AD, Gabriel Lamé)
- ▶ 1837: Plan for programmerbar computer (Charles Babbage)
- ▶ 1854: Boolean algebra (George Boole)
- ▶ 1901: Radixsort algoritme
- ▶ 1926: Minimum Spanning Tree algoritme (Otakar Borůvka)
- ▶ 1936: Turingmaskiner (Alan Turing)
- ▶ 1936: Uberegnelige problemer (Alonzo Church, Alan Turing)
- ▶ 1945: Mergesort algoritme (John von Neumann)
- ▶ 1955±: Højniveau sprog og compilere (John W. Backus, Grace Hopper, ...).
- ▶ 1959: Korteste veje algoritme (Edsger Dijkstra)
- ▶ 1961: Quicksort algoritme (Tony Hoare)

# Teori

- ▶ 1961: Packet switching networking (Paul Baran)
- ▶ 1965: Komplexitetsteori (Juris Hartmanis, Richard E. Stearns, Jack Edmonds)
- ▶ 1968: Første lærebøger i datalogi (Donald Knuth)
- ▶ 1971: NP-fuldstændighed,  $P=NP?$  (Stephen Cook, Richard Karp)
- ▶ 1976: Public-key krypteringsprincip (Whitfield Diffie, Martin Hellman)
- ▶ 1977: RSA krypteringsalgoritme (Ron Rivest, Adi Shamir and Leonard Adleman)
- ▶ 1989: WWW (HTTP/HTML) (Tim Bernes-Lee [1945, Vannavar Bush])
- ▶ 1996: PageRank algoritme (Larry Page, Sergey Brin)
- ▶ 2002: PRIMTAL algoritme (Manindra Agrawal, Neeraj Kayal, and Nitin Saxena).



# Morale

Datalogi er:

- ▶ Ideer skabt af mennesker.
- ▶ **Dynamisk**, ikke statisk (nye ideer og resultater produceres hele tiden).