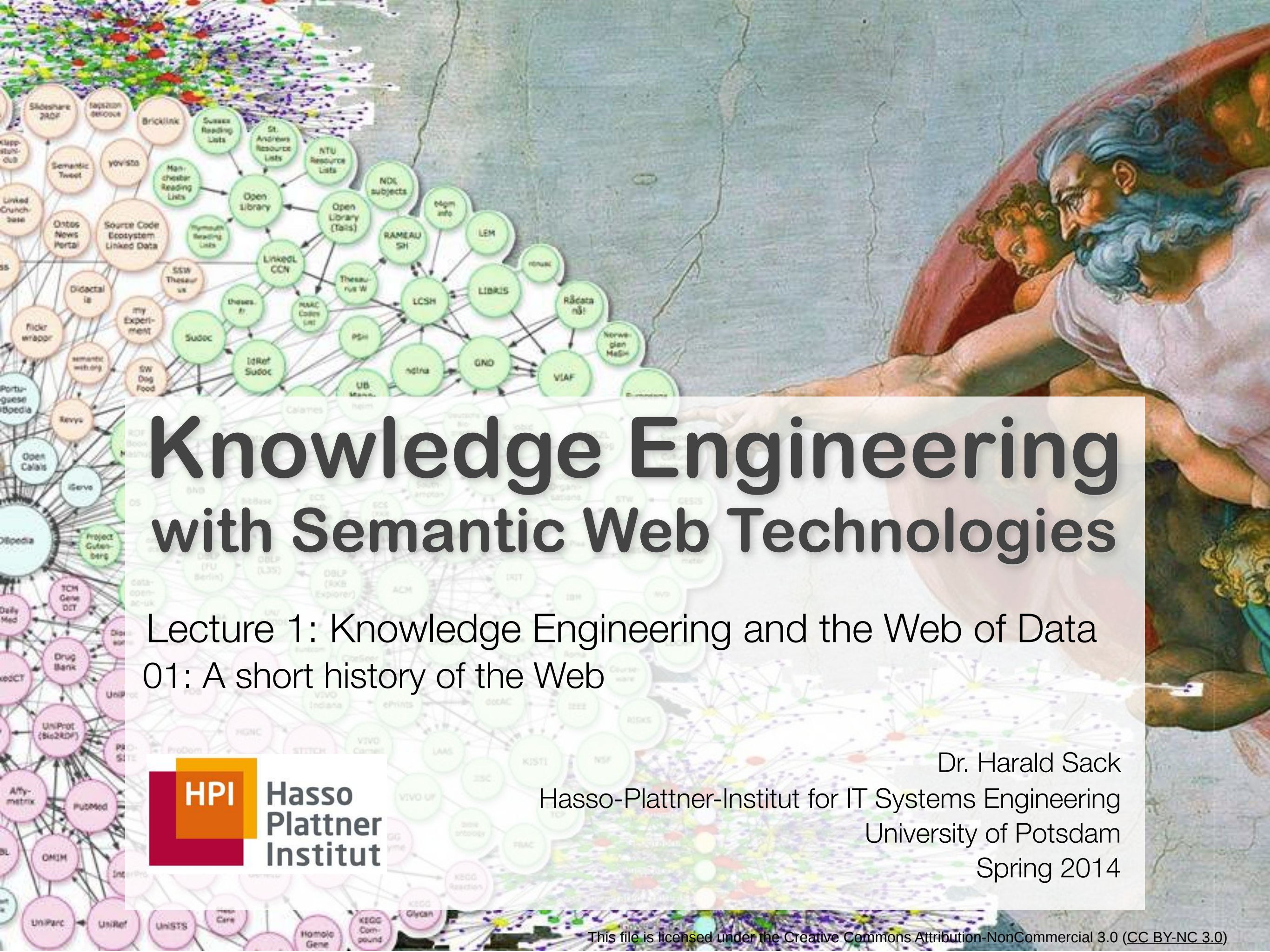




Knowledge Engineering with Semantic Web Technologies

Lecture 1: Knowledge Engineering and the Web of Data
01: A short history of the Web



Dr. Harald Sack
Hasso-Plattner-Institut for IT Systems Engineering
University of Potsdam
Spring 2014



Lecture 1: Knowledge Engineering and the Web of Data

Open HPI - Course: Knowledge Engineering with Semantic Web Technologies



01: A short history of the Web

OpenHPI - Course Knowledge Engineering with Semantic Web Technologies

Lecture 1: Knowledge Engineering and the Web of Data



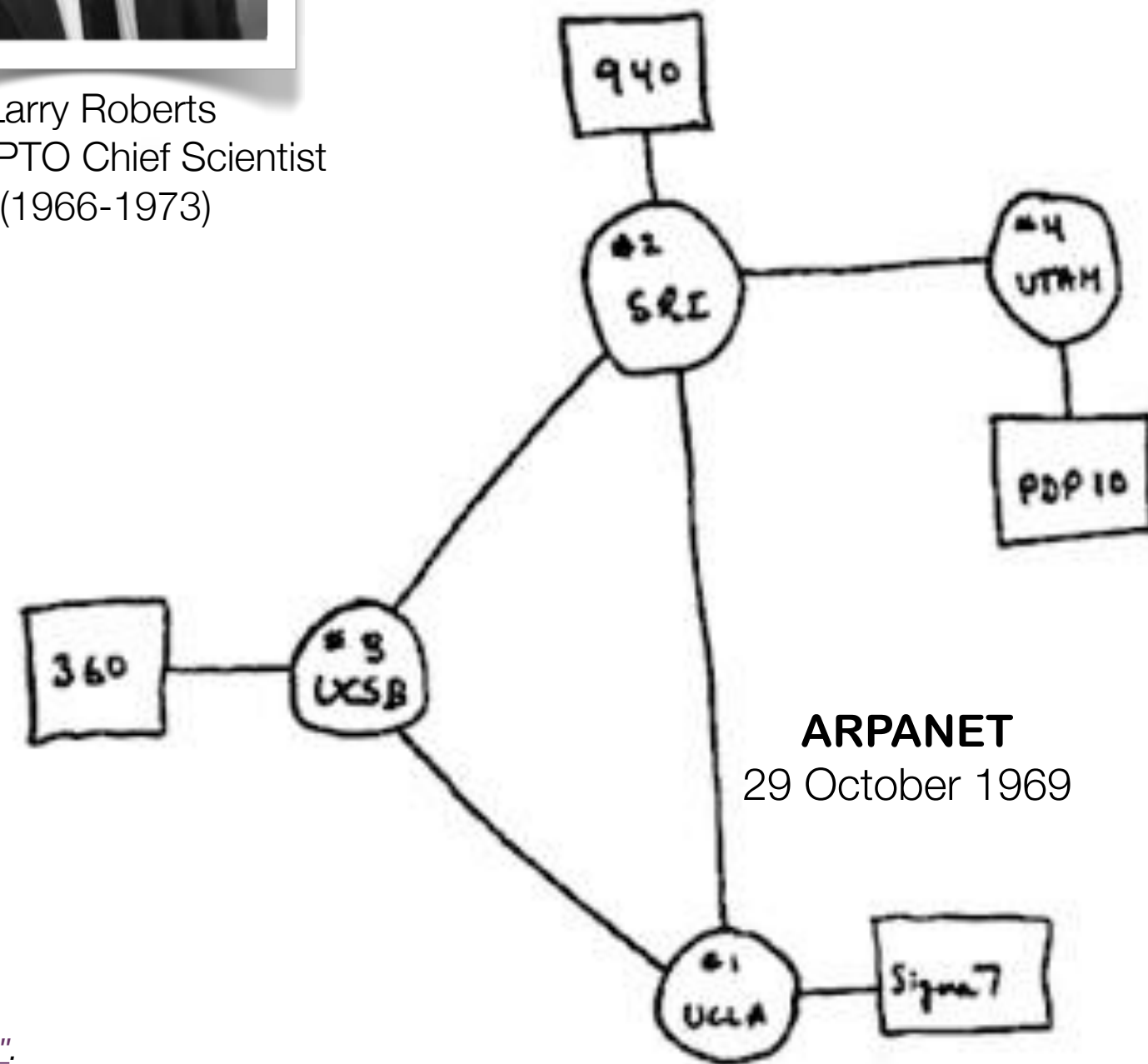
J.C.R. Licklider
ARPA IPTO Director
(1962-1964)

Robert Taylor
ARPA IPTO Director
(1966-1969)

Larry Roberts
ARPA IPTO Chief Scientist
(1966-1973)

"[...] we are entering a technological age in which we will be able to interact with the richness of living information - not merely in the passive way that we have been accustomed to using books and libraries, but as active participants in an ongoing process, bringing something to it through our interaction with it, and not simply receiving something from it by our connection to it."

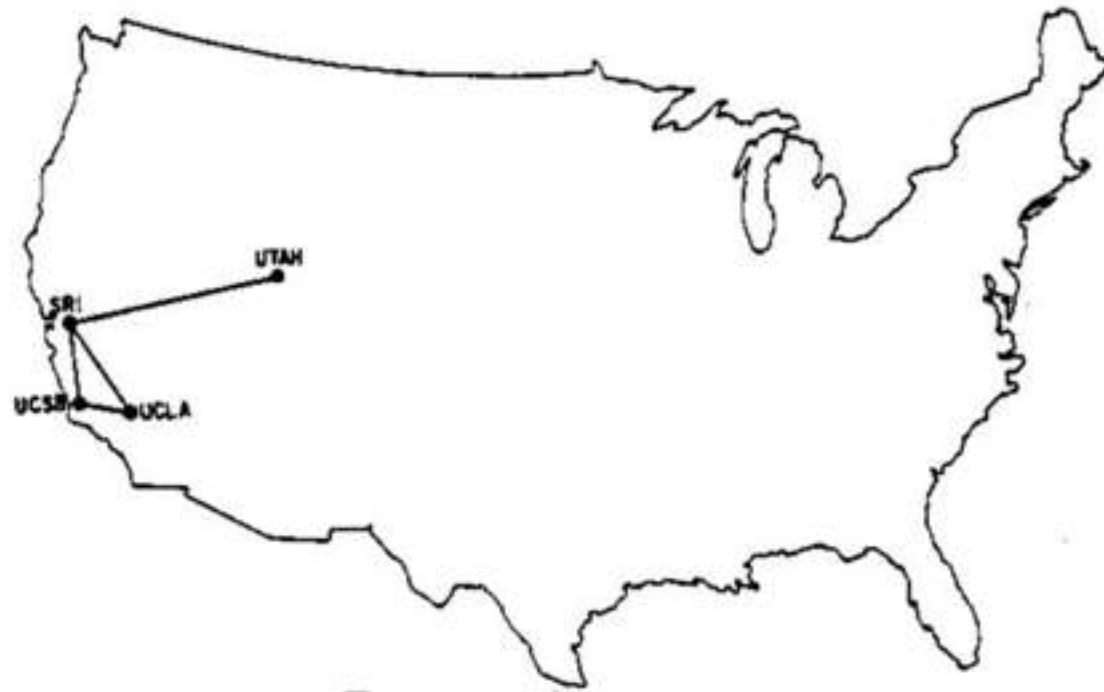
J.C.R. Licklider, Robert Taylor: *"The Computer as a Communication Device"*.
Science and Technology 76, pp. 21-31 April 1968.



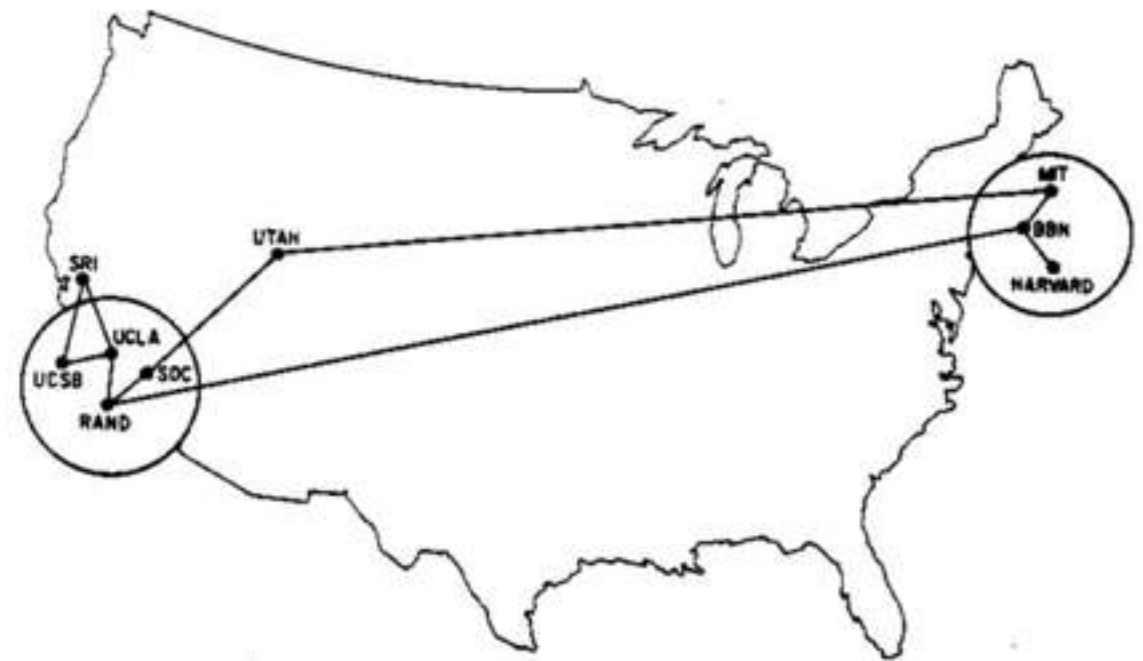
Knowledge Engineering with Semantic Web Technologies

The Growth of the ARPANET

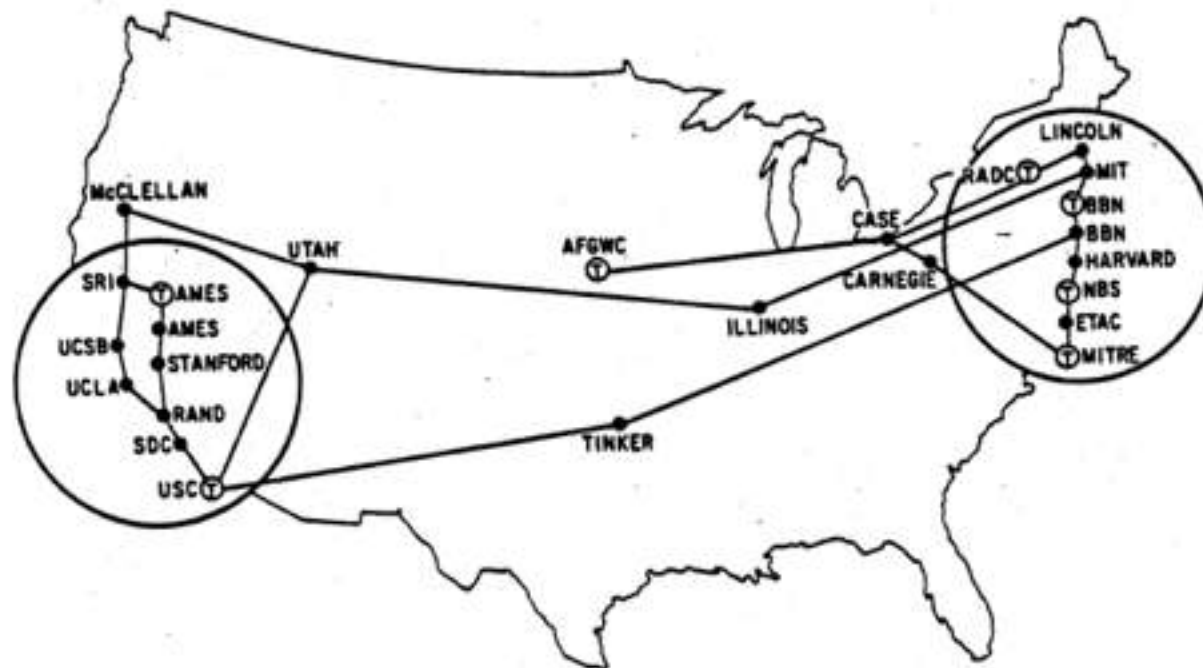
5



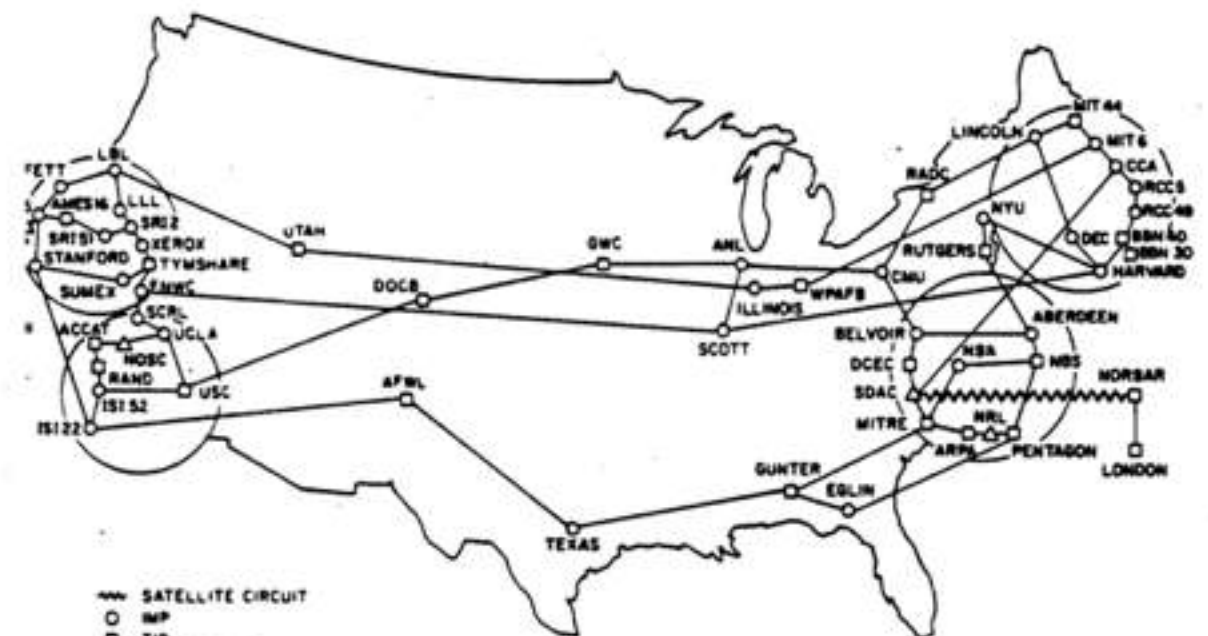
December 1969



June 1970



March 1972

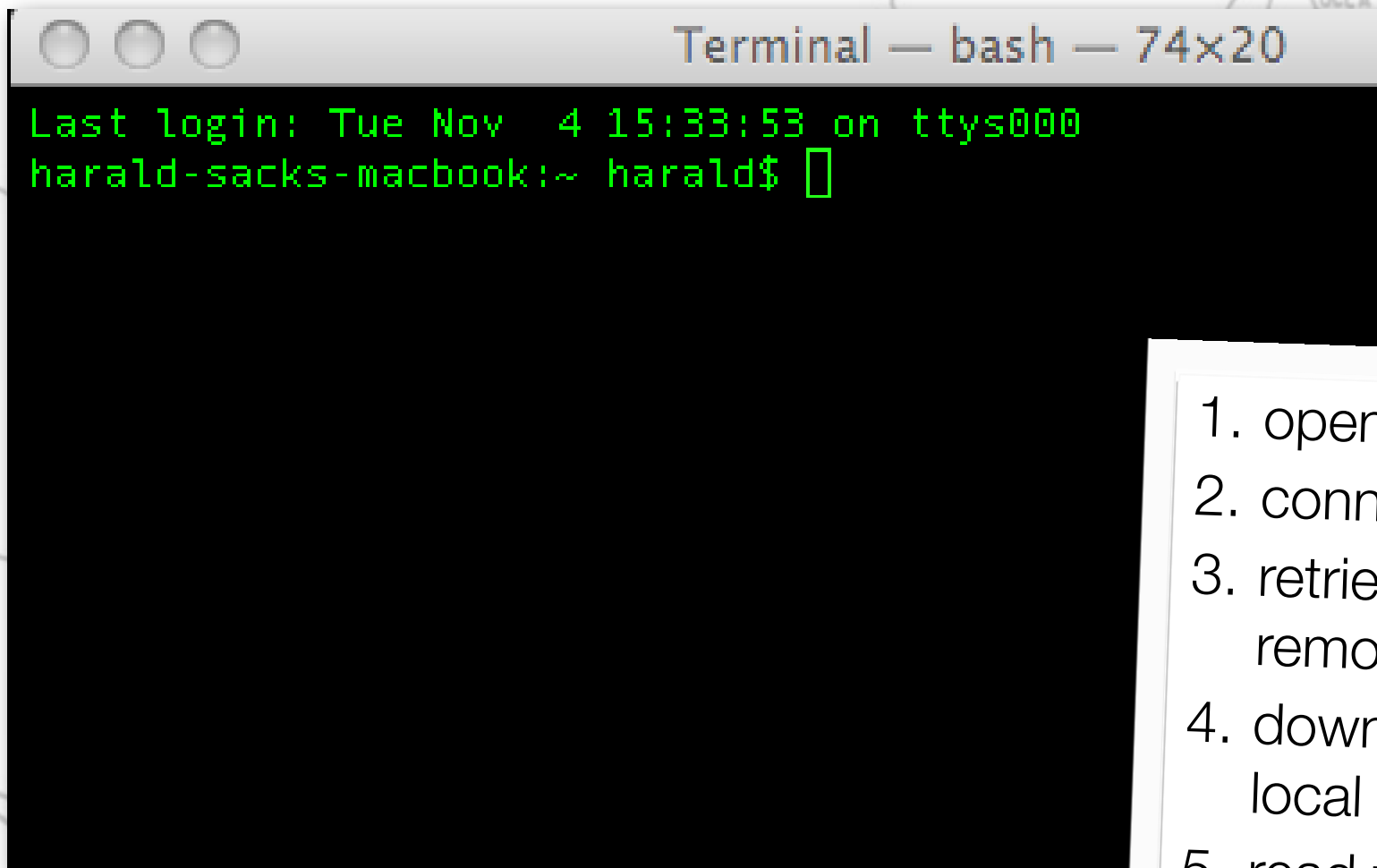


July 1977

First Generation: The Internet

Computer Centered Processing

- How did the user get the information?



```
Terminal — bash — 74x20  
Last login: Tue Nov  4 15:33:53 on ttys000  
harald-sacks-macbook:~ harald$
```

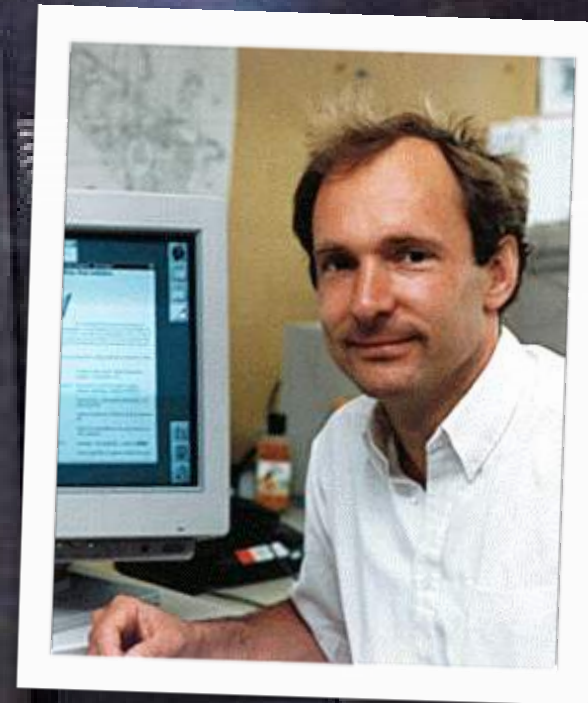
1. open terminal
2. connect to remote computer
3. retrieve file system data from remote computer
4. download file from remote to local computer
5. read file on local computer

Problem:

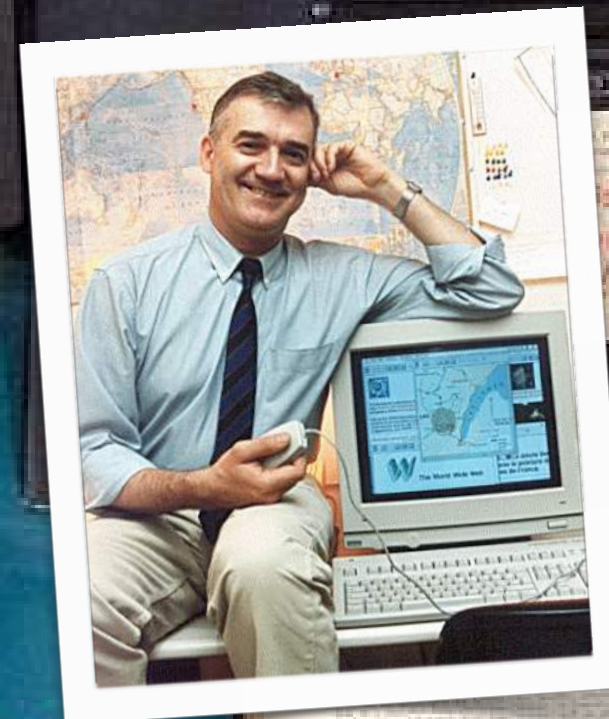
- Information access requires expert knowledge
- Information access is expensive...
- Information retrieval is very expensive...

März 1972

Juli 1977



Tim Berners-Lee



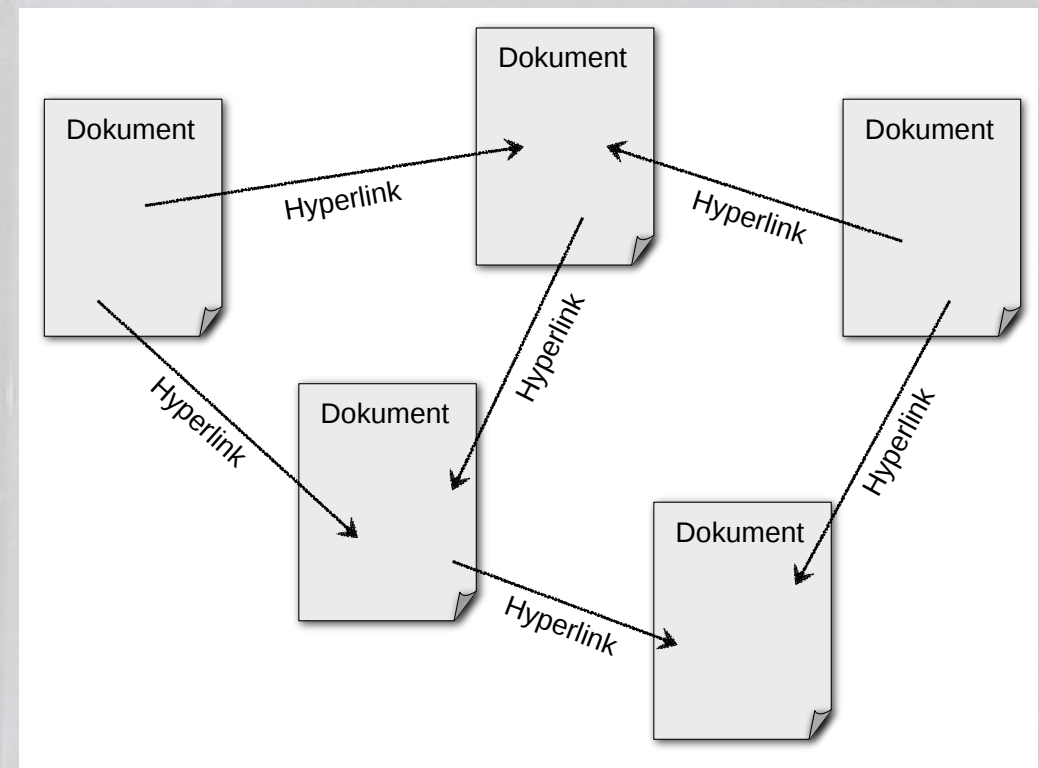
Robert Cailliau

The **World Wide Web** was born at the European Nuclear Research Center CERN in 1990...

Second Generation: The Web

Document Centered Processing

- How did the user get the information?



1. open browser
2. load document
3. click on next hyperlink
4. ...

Advantages:

- No expert knowledge required
- Simple information access
- Information retrieval via search engines

ENCYCLOPÉDIE,

O U

DICTIONNAIRE RAISONNÉ DES SCIENCES, DES ARTS ET DES MÉTIERS,

PAR UNE SOCIÉTÉ DE GENS DE LETTRES.

Mis en ordre & publié par M. *DIDEROT*, de l'Académie Royale des Sciences & des Belles-Lettres de Prusse; & quant à la PARTIE MATHÉMATIQUE, par M. *D'ALEMBERT*, de l'Académie Royale des Sciences de Paris, de celle de Prusse, & de la Société Royale de Londres.

*Tantum series juncturaque pollet,
Tantum de medio sumptis accedit honoris!* HORAT.

TOME PREMIER.



A PARIS,

Chez { *BRIASSON*, rue Saint Jacques, à la Science.
DAVID l'aîné, rue Saint Jacques, à la Plume d'or.
LE BRETON, Imprimeur ordinaire du Roy, rue de la Harpe.
DURAND, rue Saint Jacques, à Saint Landry, & au Griffon.

M. DCC. LI.

AVEC APPROBATION ET PRIVILEGE DU ROY.

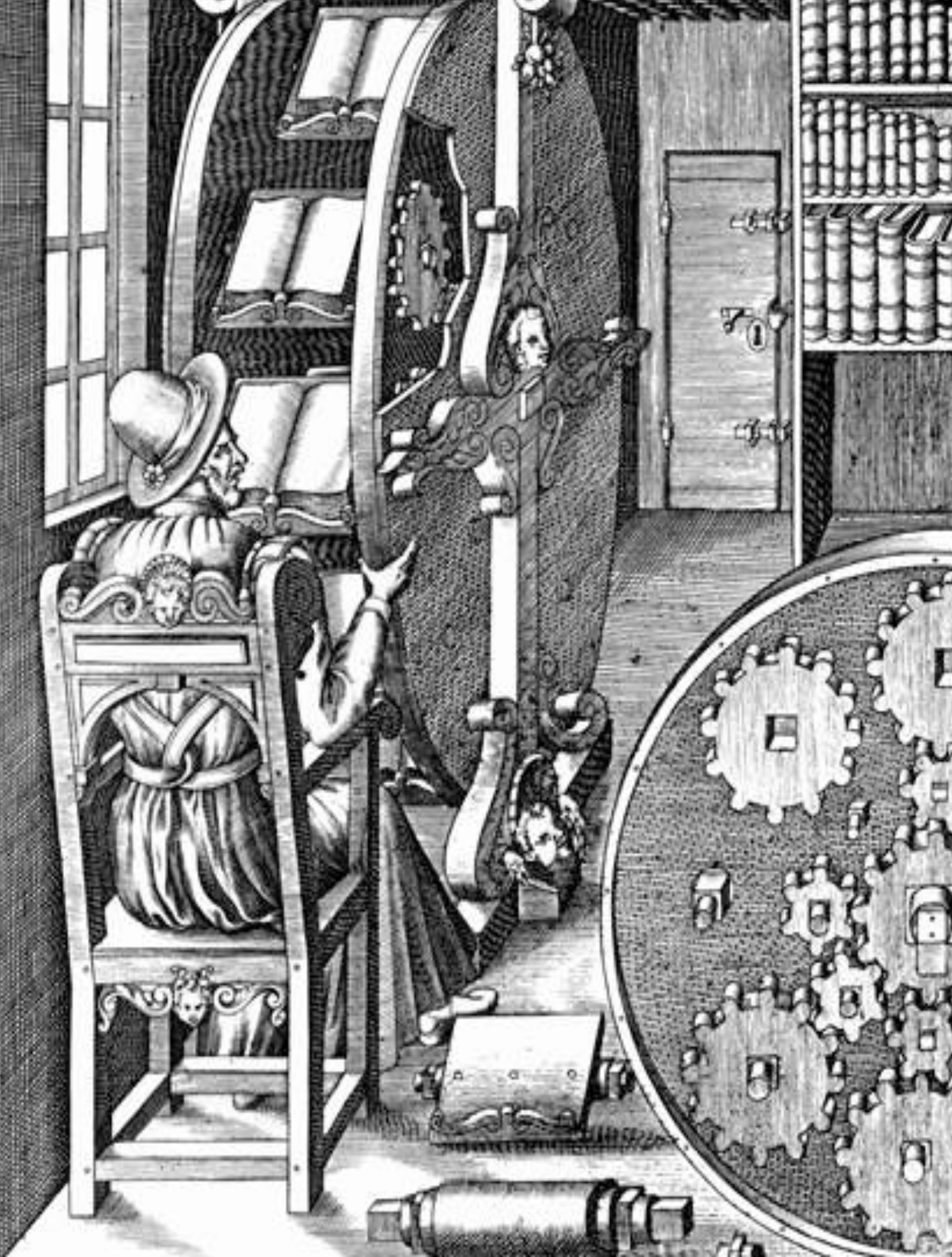
But the original idea is much older....



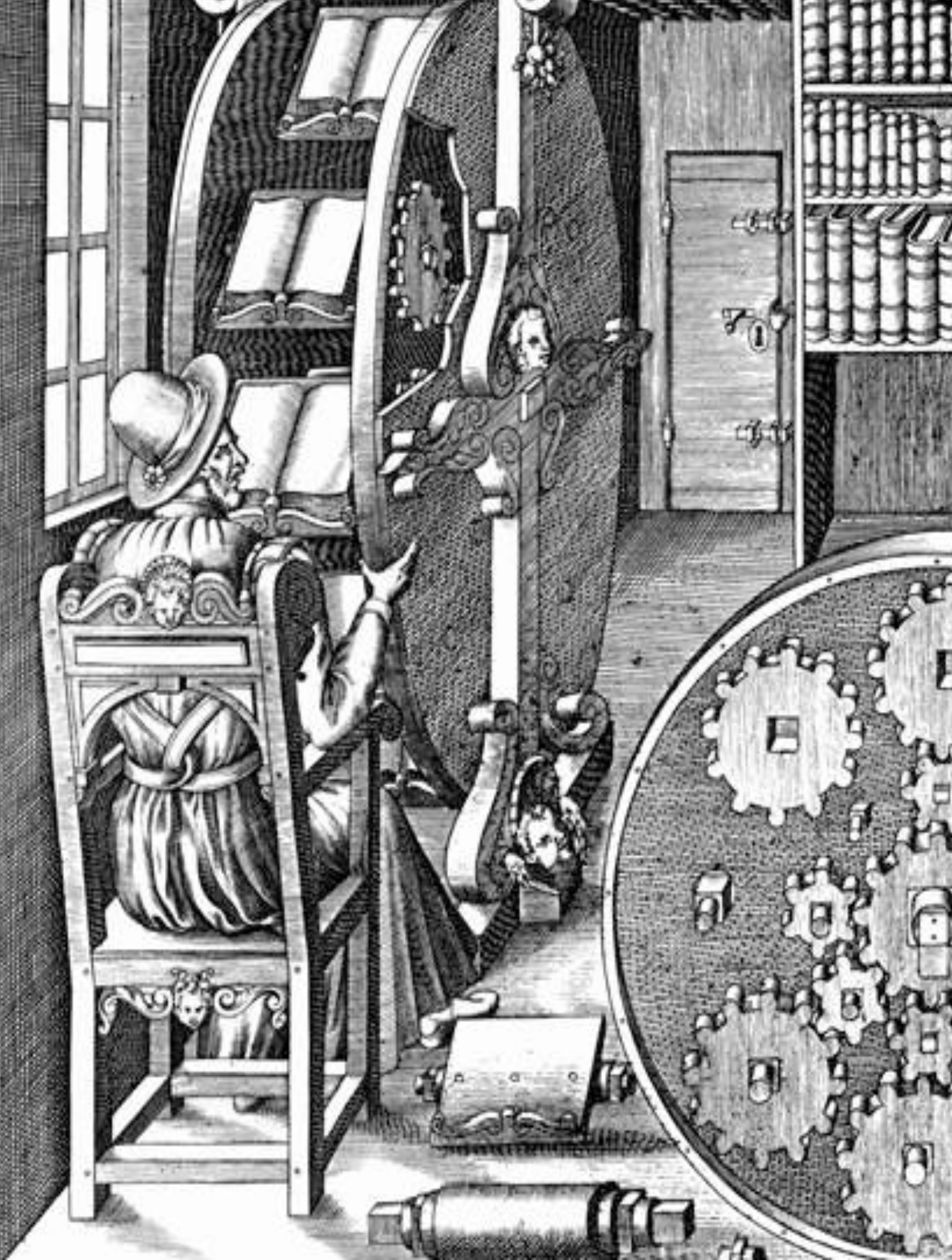
Denis Diderot
(1713-1784)



Jean-Baptiste
le Rond
d'Alembert
(1717-1783)



Agostino Ramelli (1588),
Le diverse et artificiose machine;
composte in lingua Italiana et Francese



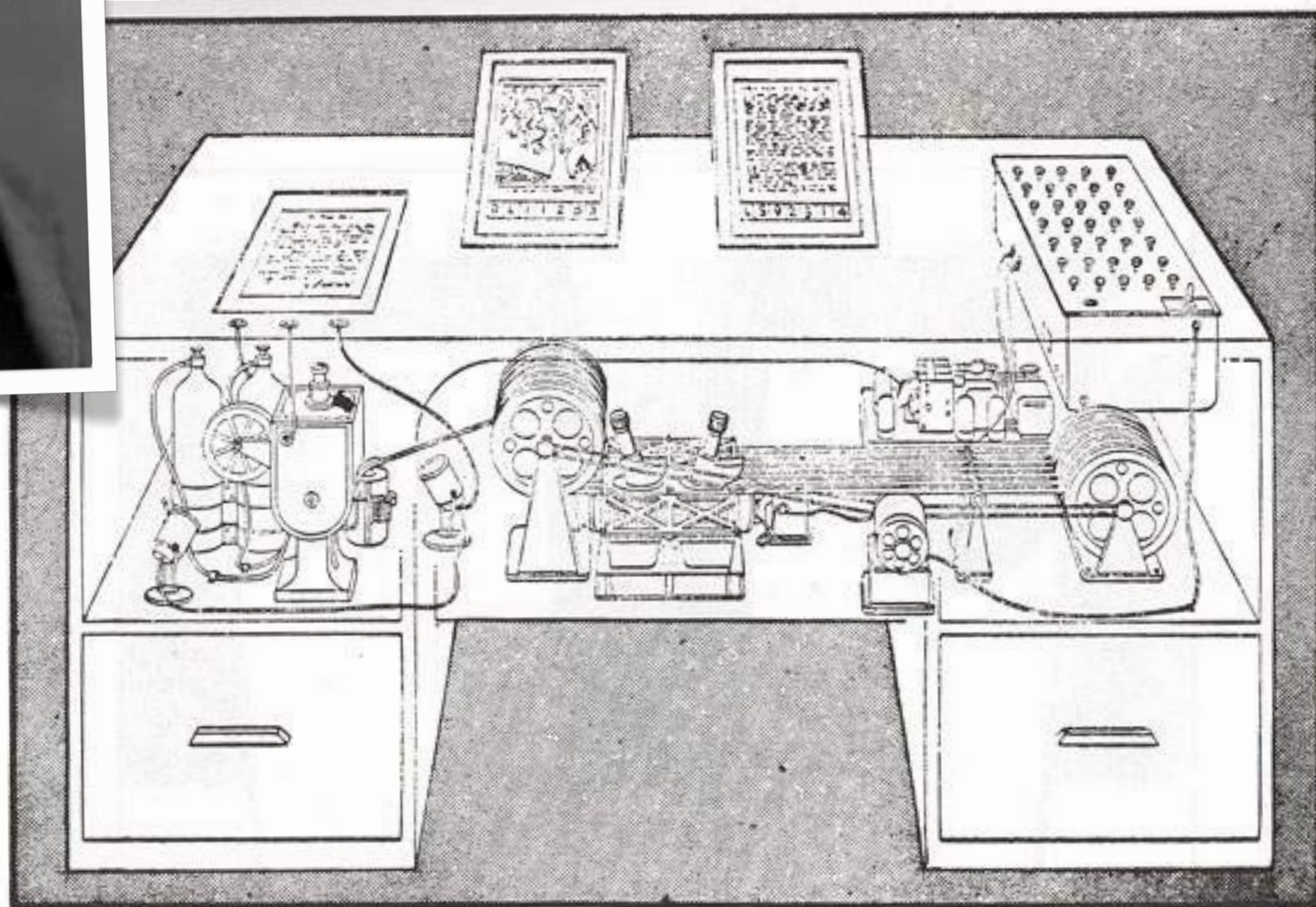
**What about
Usability...?**

Agostino Ramelli (1588),
Le diverse et artificiose machine;
composte in lingua Italiana et Francese



Vannevar Bush
(1890-1974)

Vannevar Bush proposed the first
Hypertext-System „MEMEX“ in 1945

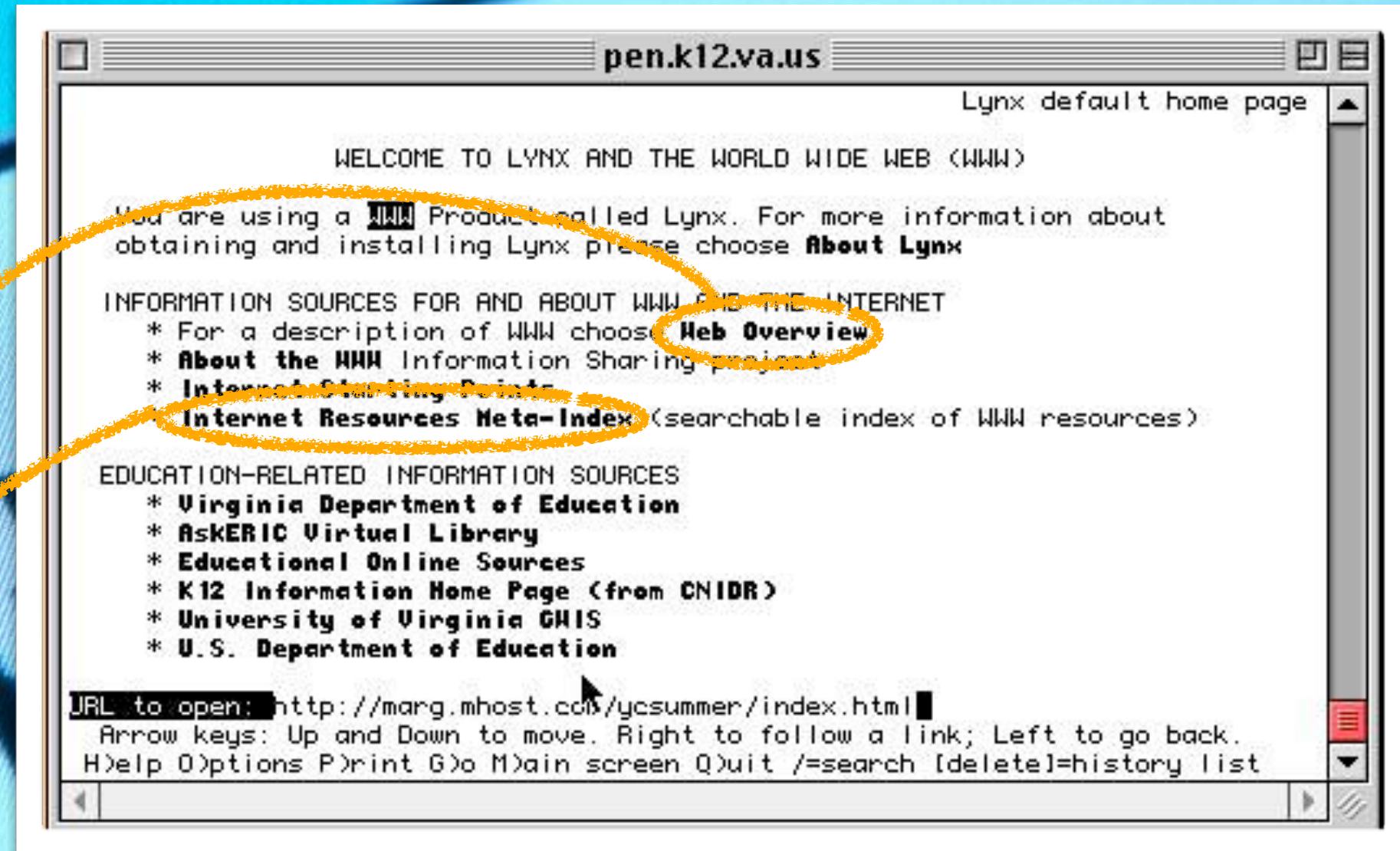


Memex in the form of a desk would instantly bring files and material on any subject to the operator's fingertips. Slanting translucent viewing screens magnify supermicrofilm filed by code numbers. At left is a mechanism which automatically photographs longhand notes, pictures and letters, then files them in the desk for future reference (*LIFE* 19(11), p. 123).

vgl. Vannevar Bush, *As we may think*,
The Atlantic Monthly, **1945**, July

Why was the Web such a big success ?

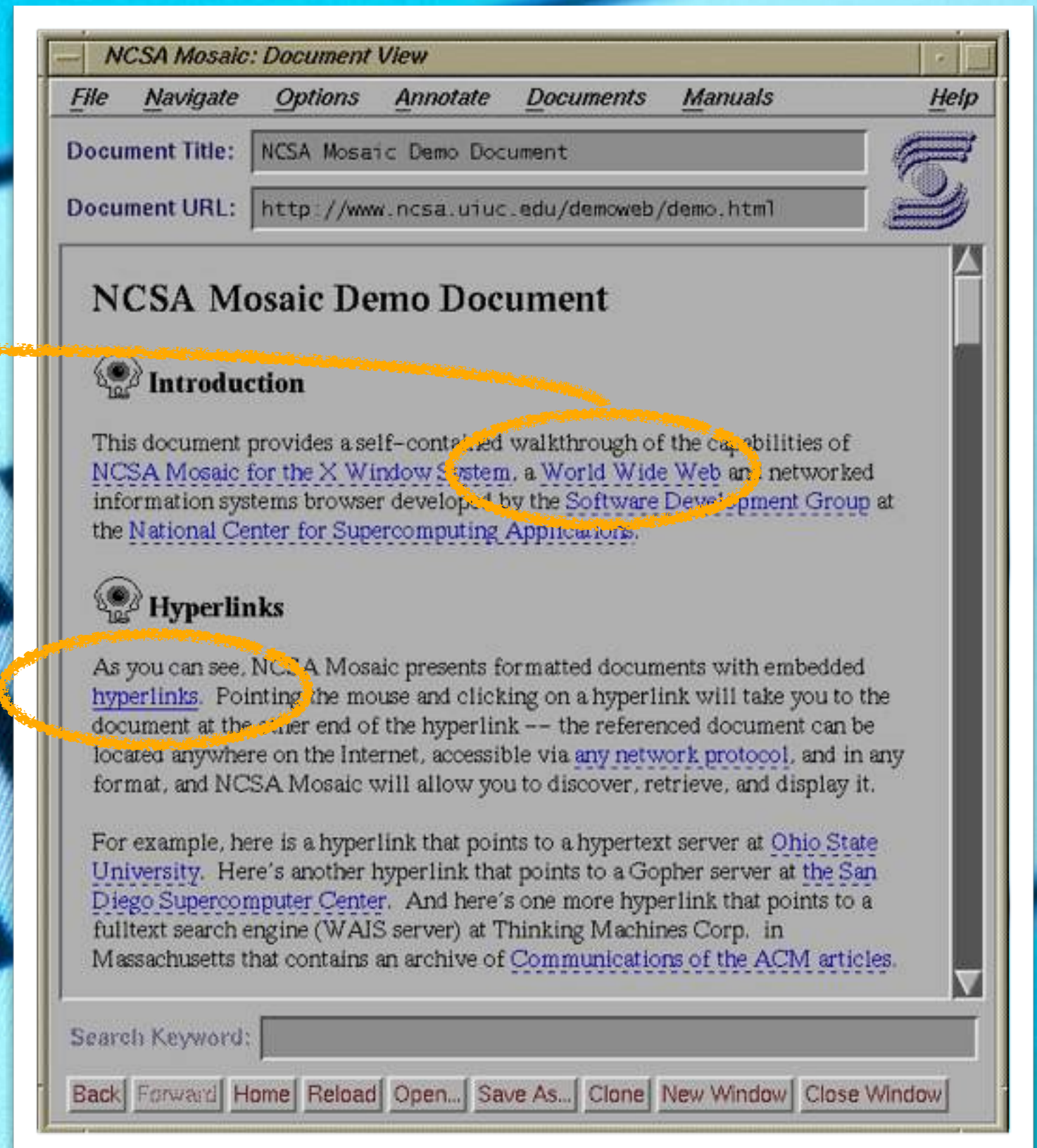
Lynx 1993



Why was the Web such a big success ?

NCSA Mosaic 1994

13



Why was the Web such a big success ?

14

IPad
Safari 2010



What's next...?

Google Glass
2013

15



There seem to be no Limits of Growth...

Internet Domain Survey Host Count



Source: Internet Systems Consortium (www.isc.org)

Web Content and Applications are Changing

-- Tim O'Reilly, 2003



Just keep in mind that the Web is based on public infrastructure, protocols, and data transfer...



SCORE 7040

LIVES



Next section



02: The Limits of the (current) Web ...

OpenHPI - Course Knowledge Engineering with Semantic Web Technologies

Lecture 1: Knowledge Engineering and the Web of Data