

UNIVERSITY OF  
Southampton

# Trailblazers: History of Hypertext Part 3

COMP3220 Web Infrastructure

Dr Nicholas Gibbins – [nmg@ecs.soton.ac.uk](mailto:nmg@ecs.soton.ac.uk)





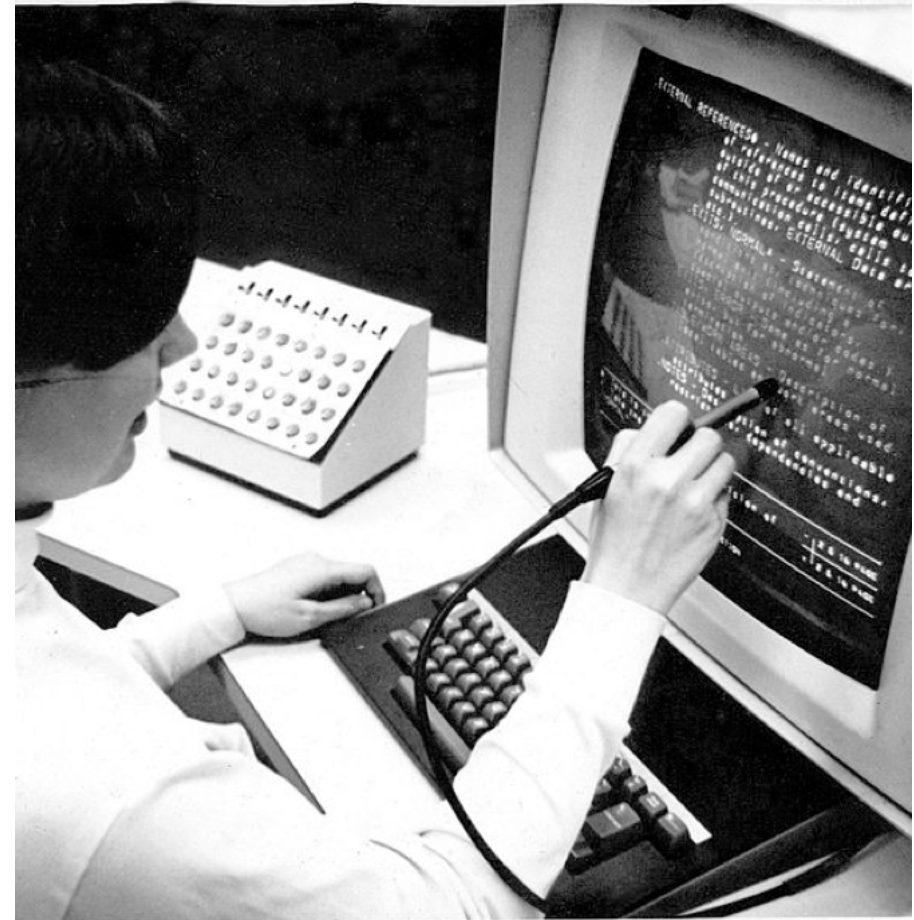
# Hypertext Systems

<http://www.flickr.com/photos/mwichary/2355783479/>

# HES/FRESS (1967)

Hypertext Editing System developed at  
Brown University

Used by NASA to produce and manage  
documentation for the Apollo programme



# ZOG (1975)

Developed at Carnegie Mellon University

Features:

- Early proponent of the “card” or “frame” model of hypertext (c.f. index cards)
- One-way links, embedded in frames

```
-----  
| This TITLE line summarizes the frame's content                               Frame1  
| This TEXT expands the frame's main point of information. It is often omitted.  
| The options below can provide an enumerated expansion.  
|  
| 1. This OPTION leads to another frame  
|  
| 2. OPTIONS often are like subpoints in an outline  
|  
| 3.-The minus sign means this OPTION has no next frame  
|  
|  
|         L. This LOCAL PAD is a cross-reference link  
|         A. Local pads can also execute actions  
|  
| edit help back next mark return zog display user top goto find info  
|-----
```



Akscyn R.M. and McCracken D.L. (1981) *ZOG and the USS CARL VINSON*. Computer Science Research Review 1980-1981. USA: Carnegie Mellon University.

# KMS (1983)

KMS Author: 11A fraxinus Knowledge Systems User: kgronbak TimesRoman: 6 Spacing: 2 Justification: Left

### Home frame

This is your initial **home frame**, which you are free to edit. It is your "base of operations" in KMS. KMS automatically displays your home frame when you enter KMS. You can return to this frame at any time by clicking on the Home command item at the bottom of the frame.

Typically, a person's home frame has links to all the projects and documents they're working on in KMS. As they create new sets of frames, they add links to them from this frame.

◦ Click here to see several real-life examples of home frames

---


**Index to your frames**  
(possible topics)

- Projects I'm working on
- Documents I'm writing
- Tasks I need to do
- Tasks for my assistant
- Conference planning
- Miscellaneous notes
- Financial records
- Letters and memos
- Names and addresses
- Meeting agendas
- Calendar

**Resources**

- **KMS Walking Tour**  
(we recommend you take this Tour to start learning about KMS)
- KMS Information frame  
(has links to many on-line resources)
- KMS on-line documentation
- KMS Help Index
- Your profile frames  
(for customizing the interface)
- Your saved KMS message frames
- \*H 198-ELL David KajRobl

### KMS Information

| Window system commands                                                              | Operation                            | How to do it                                                                                                                                                                                                                                    |
|-------------------------------------------------------------------------------------|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                     | Detach system cursor from KMS cursor | Click all 3 mouse buttons together                                                                                                                                                                                                              |
|                                                                                     | Reattach KMS cursor                  | Move cursor into KMS window and click any button                                                                                                                                                                                                |
|  | Redisplay both KMS windows           | Click Left and Middle buttons                                                                                                                                                                                                                   |
|                                                                                     |                                      | <ul style="list-style-type: none"> <li>• Set KMS window to half size (click on these items)</li> <li>• Set KMS window to full size</li> <li>• Get item from X Windows clipboard</li> <li>• Send attached item to X Windows clipboard</li> </ul> |

**References**

- KMS documents
- KMS Walking Tour
- KMS Help Index
- How to edit things (matrix)
- Your top Profile frame
- Examples of fill patterns, fonts, and colors
- KMS cursors
- Properly abbreviations
- Change default property values

**Programs**

|         | Frame       | FrameSet       | Tree             | Text File   |
|---------|-------------|----------------|------------------|-------------|
| Copy    | ◦ Info      |                | ◦ CopyTree       |             |
| Delete  | ◦ DeleteFr  | ◦ DeleteFract  |                  |             |
| Freeze  |             | ◦ FreezeFract  | ◦ FreezeTree     |             |
| Print   | ◦ Print cmd | ◦ PrintFract   | ◦ PrintFrameTree |             |
| Protect | ◦ Info      | ◦ ProtectFract |                  |             |
| Read    |             |                |                  | ◦ ReadText  |
| Search  | ◦ Ctrl-s    | ◦ SearchFract  | ◦ SearchTree     |             |
| Write   |             |                |                  | ◦ WriteText |

◦ Format a document (Linear)

◦ **More programs**

- Spell Checker
- How to run programs

**Symbols**

- Click on this item to display the frame with the symbol menu, copy the symbol and position and scale it.

**Fonts**

Merge one of the items below into an item to change its font family or face:

|                   |                   |                  |
|-------------------|-------------------|------------------|
| Face: Plain       | Family: Helvetica | Face: Roman      |
| Face: Oblique     | Family: Courier   | Face: Bold       |
| Face: BoldOblique | Family: Symbol    | Face: BoldItalic |

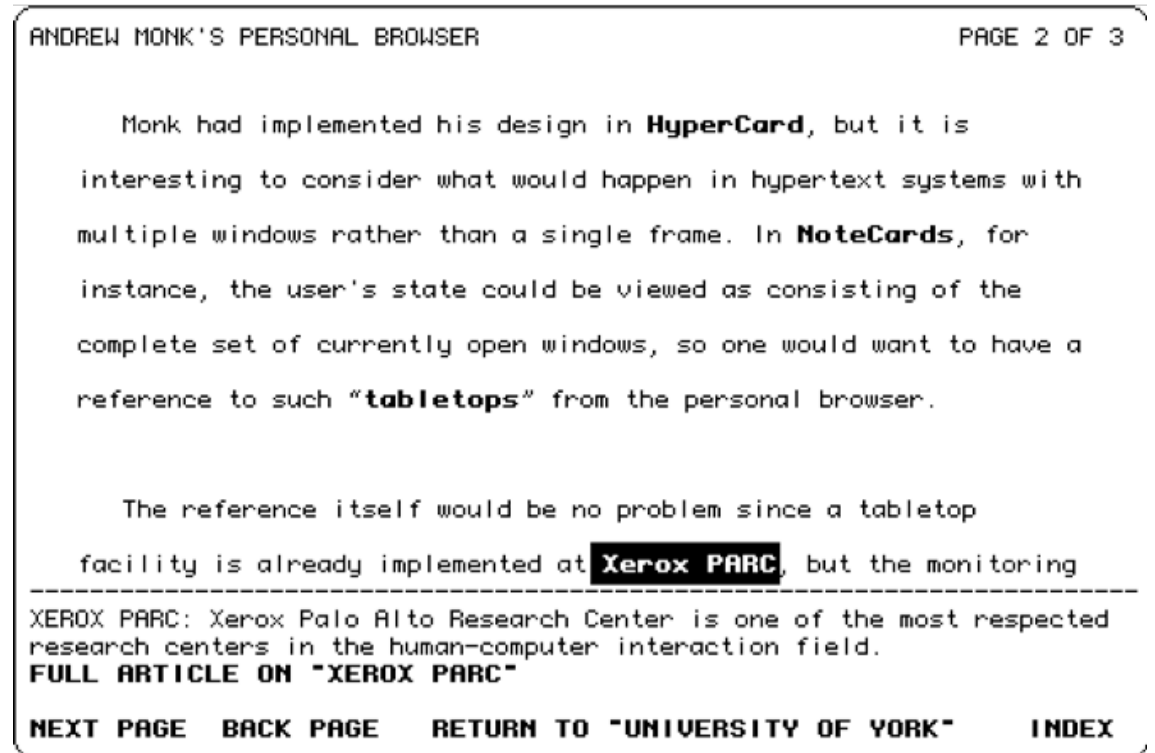
File Save Exit Reset Msg Home Prev Next Goto Help ReCalc Linear Print Fmt UnDel Grid Show
File Save Exit Reset Msg Home Prev Next Goto Help ReCalc Linear Print Fmt UnDel Grid Show

# Hyperties (1983)

Developed by Ben Shneiderman at the University of Maryland

## Features:

- Link previews
- Links point to whole documents



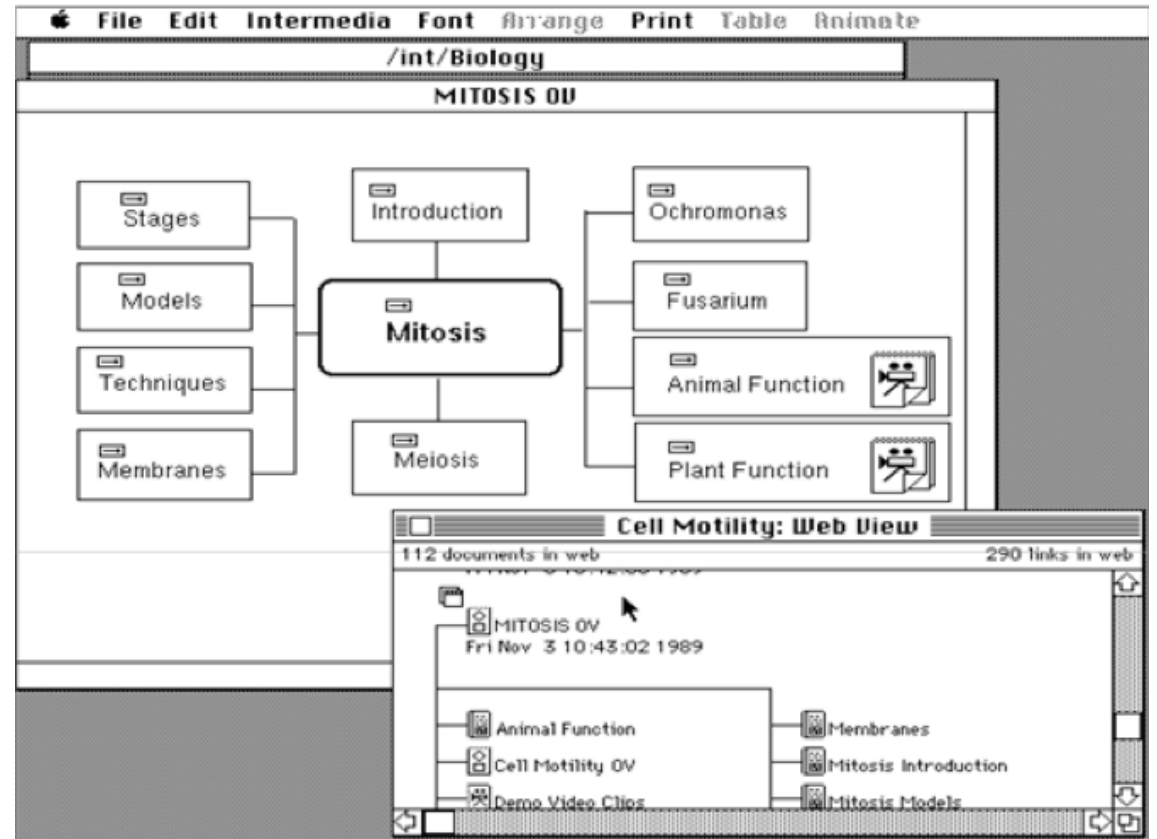


# Intermedia (1985)

Developed at Brown University

Features:

- Links stored separately from text
- Bidirectional linking
- Graphics

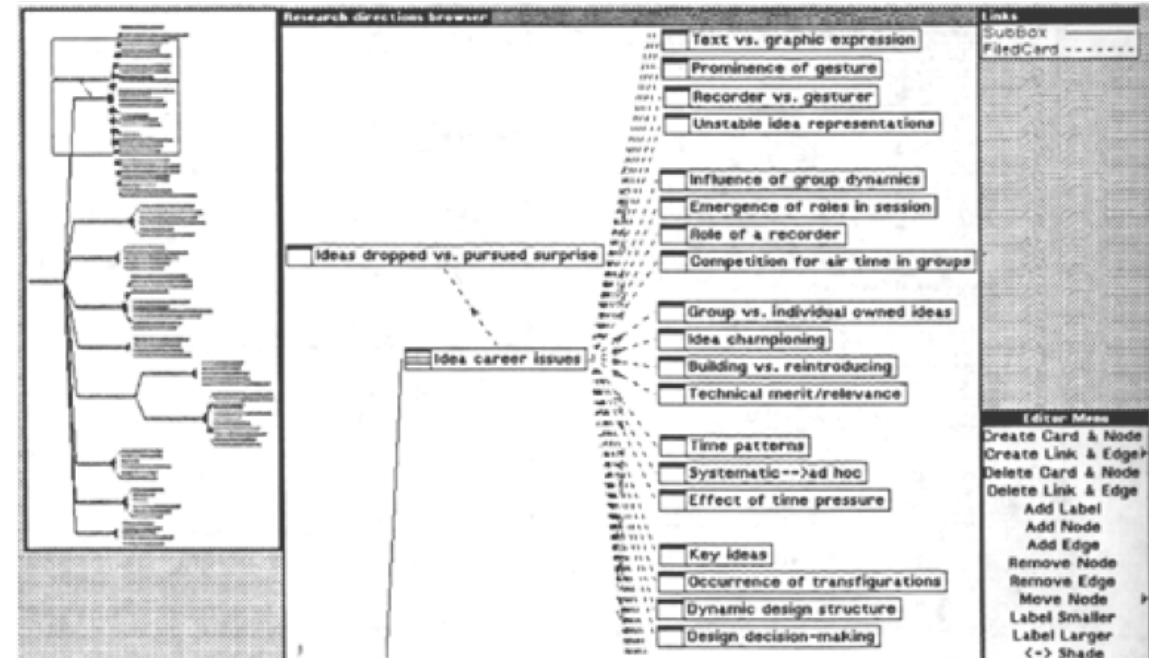


# NoteCards (1985)

Developed at Xerox PARC (Trigg, Moran and Halasz)

Features:

- Hierarchical browser
- Programmable API
- Graphics

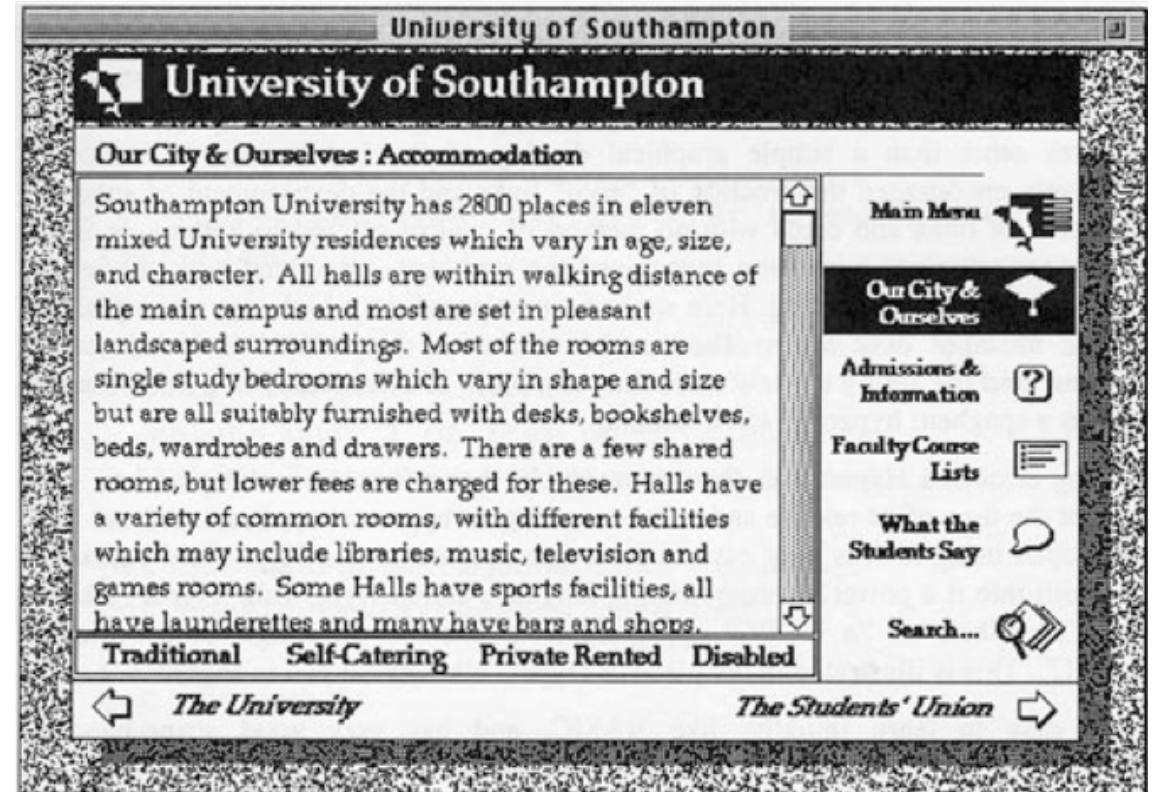


# HyperCard (1987)

Developed by Apple Computer Inc., and bundled with new Mac SEs.

Features:

- OO programming language (HyperTalk)
- Graphics
- Widely used for application development





Miller, R. and Miller, R. (1993) *Myst* [Video game]. Mead, WA, USA: Cyan, Inc.

# Conklin on Hypertext

# Hypertext: An Introduction and Survey

“The concept of hypertext is quite simple: windows on the screen are associated with objects in a data base and links are provided between these objects, both graphically (i.e. as labelled icons) and in the data base (i.e. as pointers).”

# Disadvantages of hypertext

## Disorientation

- The tendency to lose one's sense of location and direction in a non-linear document
- “Lost in Hyperspace”

## Cognitive overhead

- The additional effort and concentration necessary to maintain several tasks or trails at one time.

# A hypertext typology

- Macro Literary Systems

Large on-line libraries in which inter-document links are machine supported; all publishing, reading, collaboration, and criticism takes place within the network

- e.g. Memex, NLS/Augment, Xanadu



# A hypertext typology

- Macro Literary Systems
- Problem Exploration Tools

Tools to support early unstructured thinking on a problem when many disconnected ideas come to mind

- Early authoring and outlining
  - Problem solving
  - Programming and design
- 
- e.g. gIBIS

# A hypertext typology

- Macro Literary Systems
- Problem Exploration Tools
- Structured Browsing Systems

Smaller-scale systems for teaching, reference, and public information, where speed of access and ease of use is crucial

- Typically designed only for reading, not for authoring
- e.g. ZOG/KMS, Hyperties

# A hypertext typology

- Macro Literary Systems
- Problem Exploration Tools
- Structured Browsing Systems
- General Hypertext Technology

Research platforms to allow experimentation with a range of hypertext applications; most commonly applied to reading, writing, collaboration

- e.g. NoteCards, Intermedia, HES/FRESS

# Halasz on Hypertext

# Reflections on Notecards

In 1989, Halasz identified seven issues for the next generation of hypertext systems:

- Search and query
- Composites
- Virtual Structures
- Computation over networks
- Versioning
- Support for collaboration
- Extensibility

# The seven issues

## Issue 1: Search and query in a hypermedia network

- Link navigation is not always the best way to find things
- Better might be content-based or structural search

## Issue 2: Composites - augmenting the basic model

- A way of representing and dealing with sets (or sub-networks) of nodes and links as unique entities separate from their components

## Issue 3: Virtual structures

- Documents created/defined by queries  
(could be considered equivalent to views in a relational database)

# The seven issues

## Issue 4: Computation in (over) hypermedia networks

- APIs allow cards to be orchestrated and scripts to be executed when certain events occur

## Issue 5: Versioning

- Versioning was a natural feature of early OSs that was discarded by Microsoft for DOS (versioning of hypertext is difficult)

## Issue 6: Support for collaborative work

## Issue 7: Extensibility and tailorability

- The ability to change the system to extend and change behaviours, have different appearances and use different hypertext models

# Halasz on Hypertext (part 2)



# Seven Issues Revisited

Halasz gave a keynote at Hypertext '91 in San Antonio that reconsidered and amended his seven issues:

- Ending the tyranny of the link
- Open Systems
- User interfaces for large information spaces
- Very large hypertexts

# Ending the Tyranny of the Link

Hypermedia that includes non-network structures as well as virtual structures on an equal footing with network structures.

- Wider variety of hypermedia “data models”
- Provides increased opportunity for integration with a variety of complementary systems and technologies

# Open Systems

“The monolithic hypermedia system of the 1980s is no longer a viable species (!)”

Introduction of open hypermedia systems:

- Decompose hypertext system into separate components
- Define communications protocols and formats for coordination

# User Interfaces for Large Information Spaces

Interfaces that allow users to manipulate large network structures on a workstation screen is a long-standing problem for many hypermedia systems

- Many previous systems used some form of network browser, but not always successfully

# Very Large Hypertexts

Very large: >10s or 100s of thousands of documents (!)

- Large hypertexts uncommon at this time
- One of the main selling points in the hypertext vision has been its proficiency in helping to manage VERY LARGE document collections

Challenge is to build a useable industrial-strength hypertext system capable of handling 10,000 documents (!)



...and then the Web happened

# 1990

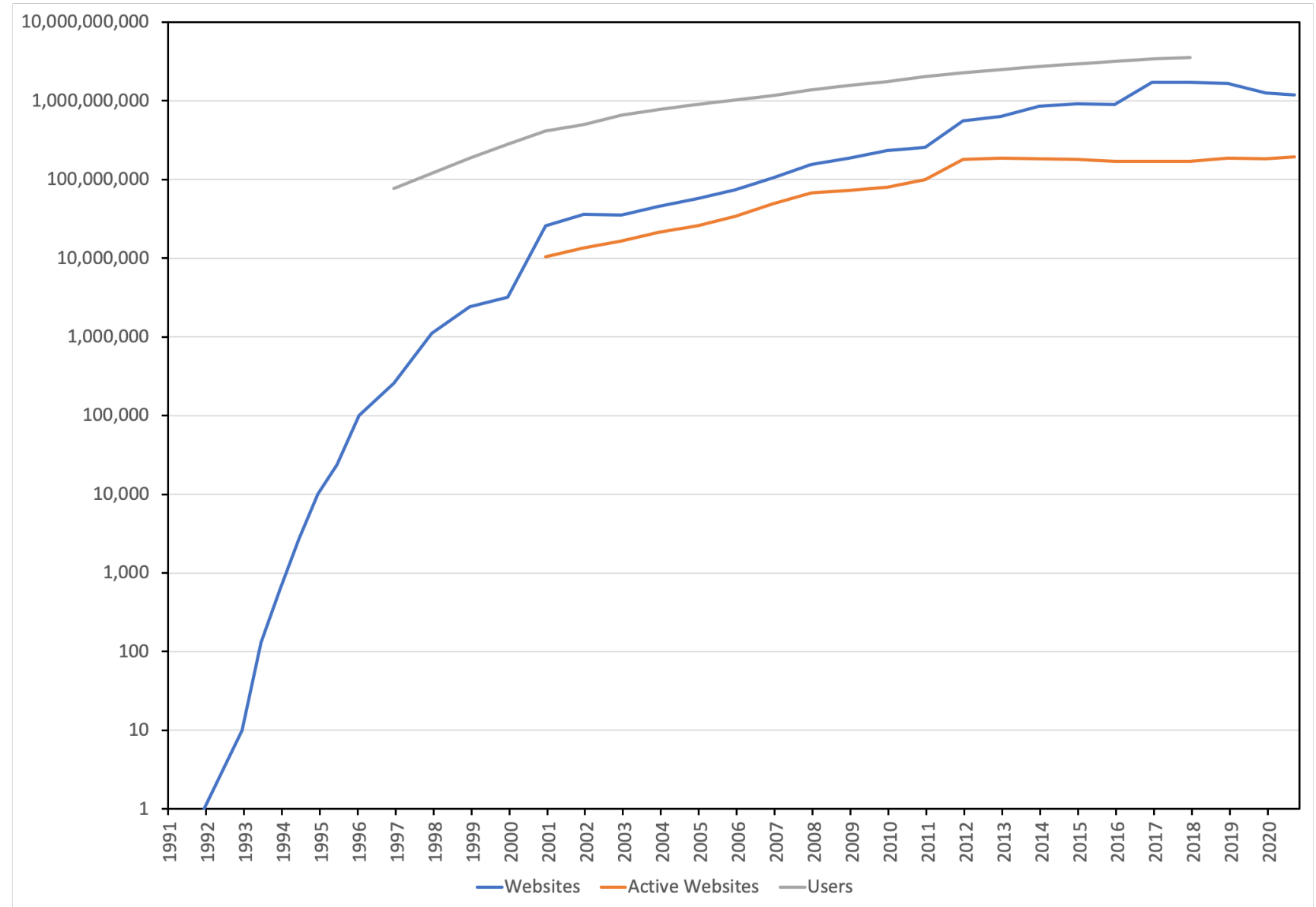
Three new Hypertext systems made their first appearance

- The World Wide Web
- Hyper-G
- Microcosm

The above list is roughly in ascending order of the degree to which they addressed Halasz's seven issues...

...and in descending order of their uptake

# Web Growth





# What is (was) the Web?

The idea of a boundless information world in which there is:

- A system of identifiers for resources (URIs)
- A network protocol that can be used to interact with those resources (HTTP)
- A mark-up language used for representing resources (HTML) which every client must understand how to render – and which can contain links to other resources



THIS IS FOR EVERYONE

Next Lecture: Open Hypermedia