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# Hypermedia: on Web

a <Web />.NET 2002  
tutorial

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## Topics

- Introduction
- What is multimedia?
- What is hypermedia?
- Components of hyperdocuments
- Hypermedia on Web  
[SMIL](#) and [XHTML+TIME](#)
- Examples

## Introduction

- Traditional media:

- Postal service

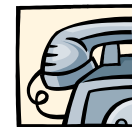


- Newspapers

- Publishing



- Telecommunications (phone)



- Broadcasts (radio, TV)

- Personal vs. Mass communication



## Multimedia

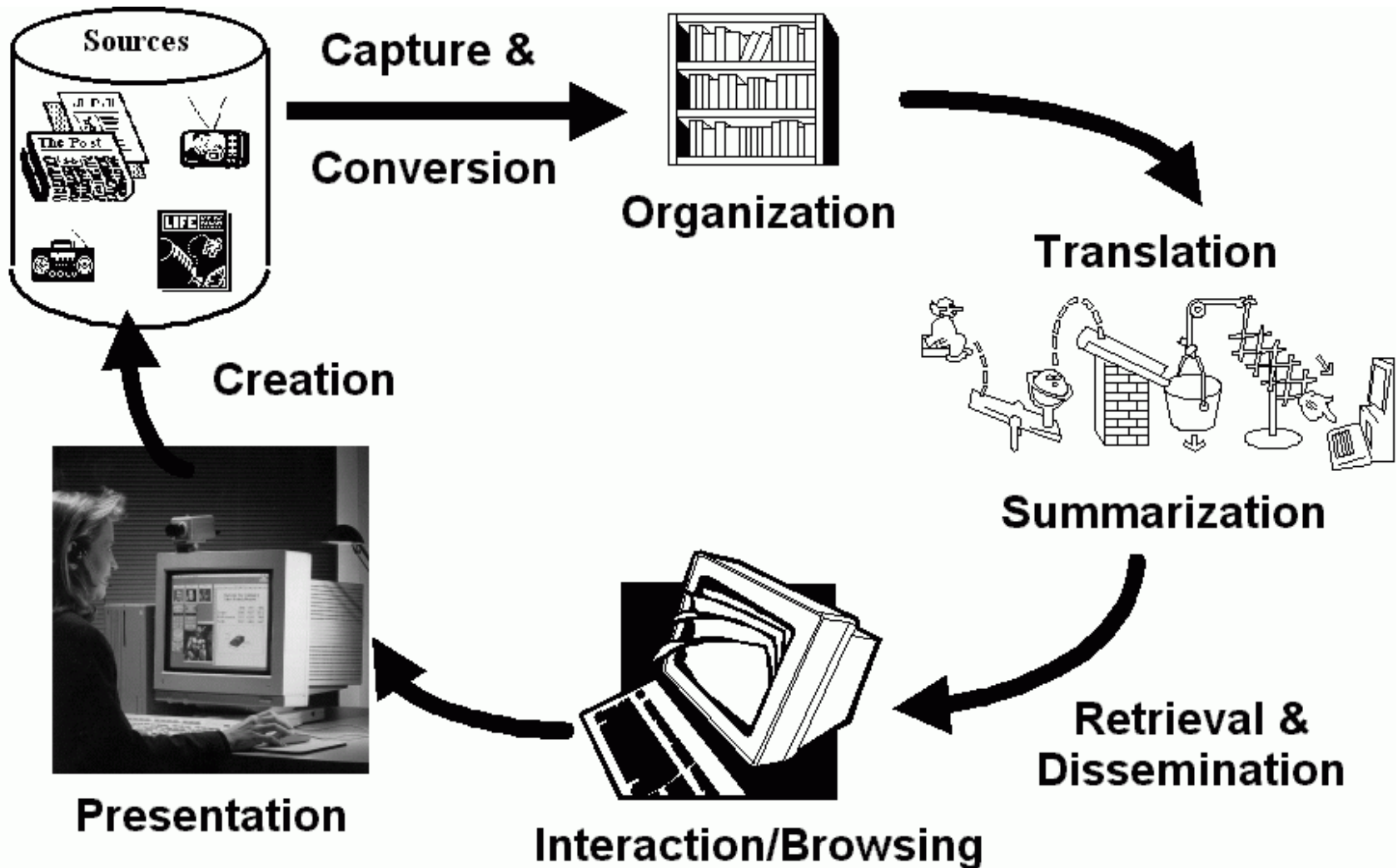
We may define **multimedia** communications as the field pertaining to the **formation, storage, retrieval, dissemination** and **usage** of documents composed of multiple “media” such as *text, graphics, still images, animation, audio* and *video*

## Multimedia (cont.)

- **Media** refers to a form of human interaction that is amenable to computer capture and processing, whereas **multi** signifies that several of those “media” are present in the same application or document
- We can call an application as a “multimedia” one if it contains at least one *time-continuous media* (e.g. audio, video or animation) and a *time-discrete media* (e.g. text or image)

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## Multimedia (cont.)



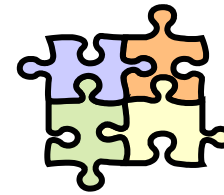
## Multimedia (cont.)

- **Benefits**

- Video conferencing



- Collaborative systems



- Distance learning



- Entertainment

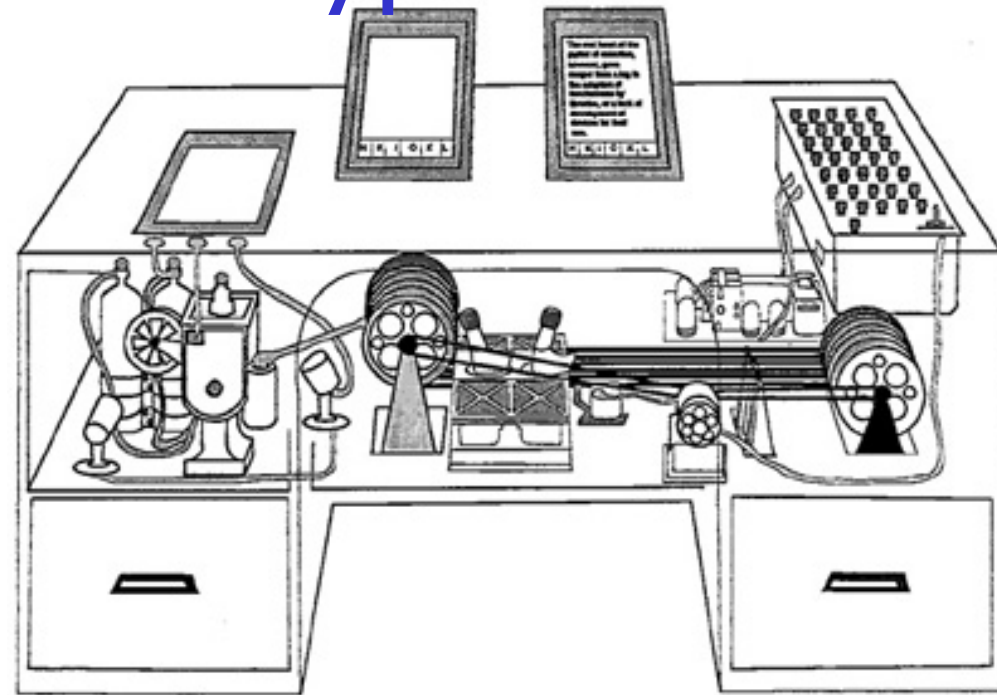


- Enable a number of participants to exchange various multimedia information via Internet

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## Hypermedia

- Background
  - Vannevar Bush  
**MEMEX** (1945)
  - Ted Nelson  
**hypertext** (1967)
    - Hypertext systems are “a computer based medium for thinking and communication” (Conklin, 1987)
    - Non-linear writing

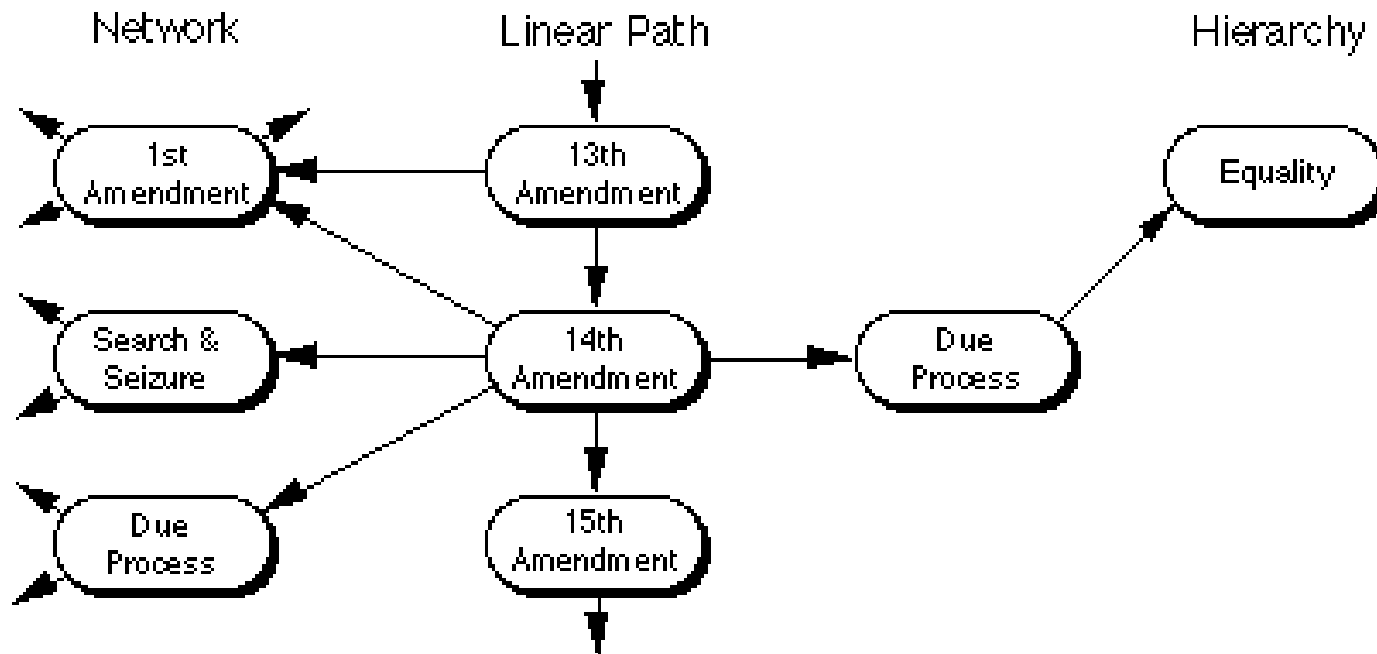


## Hypermedia (cont.)

- Information is stored in chunks, called **nodes**, which are linked together to form a network of links
- Hypertext can be viewed as a form of non-linear writing where a user follows **links** between nodes to access information

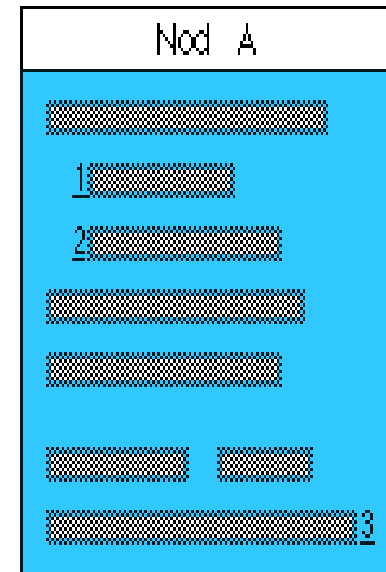
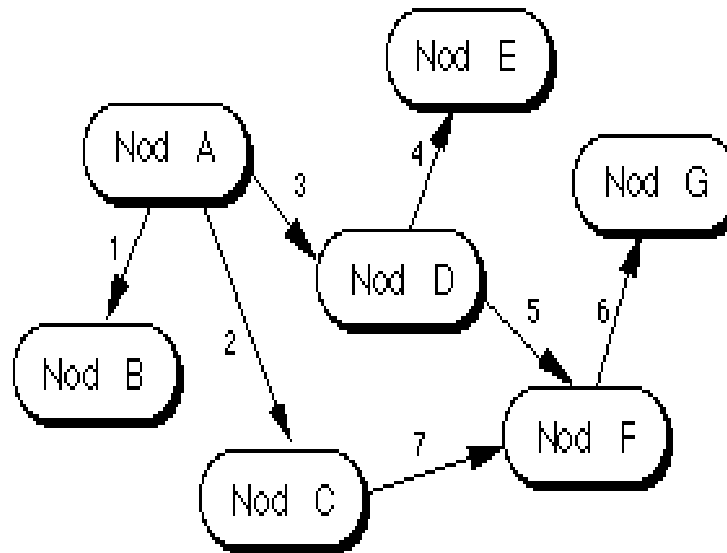
## Hypermedia (cont.)

- Hypermedia = multimedia + hyperlinks
- Hypermedia is multimedia hypertext



## Hypermedia (cont.)

- Nodes
- Links
  - Static
  - Dynamic
- Hypermedia document
- Storage system (e.g. Internet) – **server side**
- Browser – **client side**



## Hypermedia documents

- Components
  - Text (XHTML, WML, XML,...)
  - Image (BMP, EPS, TIFF, XBM, GIF, JPEG, PNG, WBMP,...)
  - Sound (MIDI, Waveform, MP3,...)
  - Animation/Video (AVI, MPEG, QuickTime, Flash,...)
  - 3D Worlds (VRML, X3D)

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## ... on the World-Wide Web

- Why Web?
  - **Strengths**
    - Convergence of technologies
    - Integrated services
    - Ease of use
    - Platform independence
    - Short development time
    - Flexibility & mobility



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## ... on the World-Wide Web

- Why Web?
  - **Weaknesses**
    - Access
    - Bandwidth
    - Loading time
    - Disorientation
    - Superficial learning



## ... on the World-Wide Web

- Synchronized hypermedia documents:
  - Basic media objects, like video or audio, have intrinsic duration
  - They can be temporally organized by the author which adds to the document a temporal structure called the **temporal scenario**
  - Edition and presentation operations are carried out at different times and by different users (authors, readers)

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## ... on the World-Wide Web

- Issues:
  - Graphical, sound and video content can not be annotated by using traditional markup languages
- Solutions:
  - XML-based languages (e.g. SVG, VML)
  - Open standards (i.e. PNG, MPEG)

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## ... on the World-Wide Web

- Web standards for authoring hypermedia presentations:
  - **SMIL (Synchronized Multimedia Integration Language)**
    - SMIL 1.0 (Aug. 1998)
    - SMIL 2.0 (Aug. 2001)
  - **XHTML+TIME (Timed Interactive Multimedia Extensions for XHTML)**
    - HTML+TIME 1.0 (MSIE 4, 5)
    - XHTML+TIME 2.0 (MSIE 5.5, 6)

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## ... on the World-Wide Web

- Advantages of SMIL
  - Wide variety of basic multimedia objects
  - Rich set of operations on them
  - Possibility to control the delivery of continuous media
  - Interactivity & adaptability
  - Temporal style definitions
  - Fast editing/presentation cycle
  - Platform independence

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## ... on the World-Wide Web

- **Browsers (players)**

- RealPlayer/RealOne
- Oratrix GRiNS
- Internet Explorer 5.5 or later

- **Authoring tools**

- Oratrix GRiNS
- RealNetworks
- Visual SMIL Editor

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## Examples

- SMIL

```
<smil>
  <head>
    <layout type="text/smil-basic-layout">
      <region id="r1" top="20" left="20"
        height="200" width="300" />
      <region id="r2" top="400" left="400"
        height="100" width="50" />
    </layout>
  </head>
  <body>
    <par>
      <video region="r1" src="video1.rm" dur="30s" />
      <video region="r2" begin="3s"
        src="http://www.infoiasi.ro/v/v2.mpeg"
        dur="2min" repeat="2" />
    </par>
  </body>
</smil>
```

`<par>` or `<seq>`

`<text>` `<textstream>` `<img>`  
`<audio>` `<video>` `<animation>`

## Examples

- XHTML+TIME

```
<html xmlns:t="urn:schemas-microsoft-com:time">
<head>
  <style type="text/css">
    .time { behavior: url(#default#time2); }
  </style>
  <?IMPORT namespace="t"
    implementation="#default#time2" ?>
</head>
<body>
  
  <table border="1" id="t"
    class="time" begin="0; t.end+2" dur="1">
    <tr><td>Blinking table...</td></tr>
  </table>
</body>
</html>
```

## Overview

- Introduction
- What is multimedia?
- What is hypermedia?
- Components of hyperdocuments
- Hypermedia on Web
- Examples

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**Thank you!**  
**Questions?**

