On Digital Archive

Ching-Chun Hsieh

Institute of Information Science

Academia Sinica

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Outline

- Background: A changing world
- A Theory of on the Cultural and Social Impact of Information Technology
- Digitizing Archives
- An introduction to the National Digital Archive Project of ROC
- Concluding Remarks

We are now living in an ever-fast changing world

Major Driving sources:

Micro-electronics
Bio-Technology
New Materials
New Machines
Communication
Computer/Computing

Post-Modernism ?

Interim Report To The President

- *Information technology (IT) will be one of the key factors driving progress in the 21th century — it is quite literally transforming the way we live, learn, work, and play.*

- *Advances in computing and communication technology will create a new infrastructure for business, scientific research, and social interaction.*

National coordination Office for Computing,Information, and Communications,   August 1998

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Transforming the way we communicate

Vision

One billion people worldwide can access the Internet simultaneously and engage in real-time electronic meetings, download the daily news, conduct financial transactions, or talk to friends and relatives around the world.

This can be done regardless of the language in which the participants are speaking, since language translation can be done simultaneously, regardless of physical limitations, because devices can accept and provide input and output in many ways.

Transforming the way we deal with information

- ## *Vision*

  An individual can access, query, or print any book, magazine, newspaper, video, data item,or reference document, in any language by simply clicking the mouse, touching the computer screen, talking to the computer, or blinking an eye.

  Individual can easily select among modes of presentation: data, text, image, or audio.

  Information can be referenced and derivations can be incorporated in many new ways, adding value and revealing insights through networked and software based tools.

Transforming the way we learn

Vision

Any individual can participate in on-line education programs regardless of geographic location,age, physical limitation,or personnel schedule.

Every one can access repositories of educational materials,easily recalling past lessons, updating skills, or selecting from among different teaching methods in order to discover the most effective style for that individual.

Education program can be customized to each individual's needs so that our information revolution reaches everyone and no one get left behind.

Information Technology: *Transforming our Society*

- Transforming the way we
  - communicate
  - deal with information
  - learn
- Transforming the nature of
  - commerce
  - work
- Transforming the practice of health care

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- Transforming how we
  - design and building things
  - conduct research
  - deal with environment
- Transforming government

A Humanity Point of View

- How information technology interact with our culture and society?

- What are the cultural and social impact of Information technology?

- Can our culture survive in information age? Will our tradition become endangered while Internet become more popular?

- *If so, what shall we do?*

A Theory of

the Cultural and Social Impact of

Information Technology

Two major driving forces of social transformation

- *Communication behaviors*

- *The ways knowledge is handled*

Two Major Functions of IT

- Communication
  - Person to person
  - Person to Machine
    - *Query and Access*
    - *Learning*
  - Mass Communication
    - *Dissemination*
    - *Education*
  - Machine to Machine

- Knowledge Processing
- Ownership
- Storage
- Accumulation / Growth
- Applications of knowledge
- Searching for new knowledge

W. Weaver： *a general definition*

『The word *communication* will be used here in a very broad sense to include *all of the procedures by which one mind may affect another.* This, of course, involves not only written and oral speech, but also music, the pictorial arts, the theatre, the ballet, and in fact *all human behavior*. In some connections it may be desirable to use a still broader definition of communication, namely, one which would include the procedures by means of which *one mechanism affects another mechanism.* 』

in "A Mathematical Theory of Communication", 1949

Communication:
the source of civilization

- *Information technology is also communication technology.*

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Progress of Communication Technology

The 1st Period
230-1830
(1600 years)

- The invention of Paper   105
- Woodblock Printing   650
- Movable type Printing   1045
- Pencils   1630
- Eraser, Carbon paper   1830

The 2nd Period
1830~1990
(160 years)

- Telephone   1870
- Broadcasting   1910
- Color TV   1950
- ESS, Satellite, Optical Fiber   1970
- PC, Fiber communication   1990

The 3rd Period
1990-2006?
(16 years)

- ATM, PCS, CD, WWW, Multi-media...
- ? ? ? ....
  - *Karl Hsu, Lucent Technology Inc., 1998*

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Material obstacles to traditional media

- *There are many forms of traditional media, but all rely on the consumption or destruction of physical resources to spread knowledge; know matter how few they use, they still use significant resources.*

- *As long as they use manufactured articles, media will always have these physical characteristics, and there will always be economic problems regarding storage, manufacturing, transportation, and distribution.*

- *In use, besides having to pay attention to preservation, one needs to deal with depreciation, depletion, spoilage, not to mention loss, theft, fire and flood damage, etc.*

The influence of media material

- As carriers of information, the nature of the physical media thus influences forms of thinking, methods, form, efficacy, and cost.

- Examples triggered by photosensitive materials:
  - *Photography, motion pictures, photolithography, microfilm …...*

  - *Microelectronic lithography*
    - *semiconductor wafers, microprocessors…...*

Digital Media

- Using *energy* as media with very, very low material obstacles
- Very easy to make copies at very low cost
- Almost no time barrier
- Almost no space barrier
- It is a unique general media.

Knowledge and "What is known"

- *People have the potential to learn to know.*

- *In ancient times, when discussing epistemology, it was often said that man has "the ability to know".*

- *All of the things which people does know and will be known are called "what is known".*

"What is known" thus includes:

- *components of rationality, such as common sense and intellectual knowledge*

- *components of sensation, such as feeling and mental reaction*

- *components of creativity, such as planning and design*

- *components of will, such as belief*

Media

- "What is known" is ineffable; it relies on material qualities for expression before it can be brought to the perception of others. Only after it has been brought to the perception of others can it be communicated, preserved, and otherwise made us of.

- For this reason, "what is known" is dependent on physical matter, and is thus limited by the properties of that matter, as well as by the skills and technology which expresses it.

- *We use the term "media" to mean material, tools and techniques for expressing "what is known".*

Media and Social Change

From historical investigations of the development of human civilization, media's influence on the representation and dissemination of knowledge has been very great. Whenever a new form of media was introduced, it invariably led to changes in the dissemination of information and knowledge, led to changes in human relations, brought about organizational and social change, and developed new forms of civilization.

Media and Culture: *A historical view*

- The Dawning of Civilization
  - The presence of Language
  - The presence of Writing
  - The invention of paper
  - The invention of woodblock printing
  - High speed printing and binding
  - …...

A Definition of Information

- *Information is the form of expression of "what is known" by media.*

  - *They are two sides of the same coin; "What is known" is the content of information; information is the form of "what is known"*

    - *Information is the projection of content on media.*

    - *Information is not solely dependent on "what is known;" it is the form of expression of "what is known" by media; it carries "what is known" in a form that is perceptible to our sense organs. When we apply it, we use the content of information ("what is known") rather than its form.*

Nature of Information

- *Inherits the nature of knowledge or "what is known"*

- *Subject to the nature of media; derived from the latter's material being*

- *Harnesses the nature of media; enhanced by tools and technology for extension*

- *Depends on methods for expressing content and quality of expression.*

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The Practice of IT

- *Derived from the technical level, the means of transmission is independent of the content transmitted, but the converse is not true.*

- *At the semantic level and the effective level, the influence of the technical level is considerable. Because of this, Shannon's theory ought to form one of the bases for communications theory.*

by W. Weaver

- *C. Shannon, A Mathematical Theory of Communication*

The Role of IT in Supporting Various Disciplines

- Not only is it a very powerful tool
- For each discipline it
  - provides new ways of looking at problems
  - offers new ways of interpreting problems
  - offers new methods of solving problems
  - provides new models and new theories to understand problems

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From Paper to Digital Media

- Library Automation
- Desk-top Publishing
- Full-text Databases
- Multi-media
- Digital Library and Digital Museum
- Digital Archive and Public Information Systems

Goals of Digitizing Archives

- Preserving national cultural collections
- Popularizing fine cultural holdings
- Strengthening cultural heritage
- Popularizing knowledge / Information
- Enhancing education and learning
- Bootstrapping cultural and value-added industries
- Improving quality of life

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An Introduction to
the National Digital Archive Project of ROC

- A 5-year plan, from 2001 to 2005
- 7 organizations involved:
  - National Palace Museum
  - National Library
  - National Museum of History
  - National Museum of Natural Science
  - The Taiwan Provincial Archive Division
  - National Taiwan University
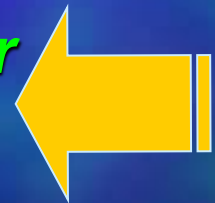 - Academia Sinica

A Scenario

Original Holdings → **Digital Files**
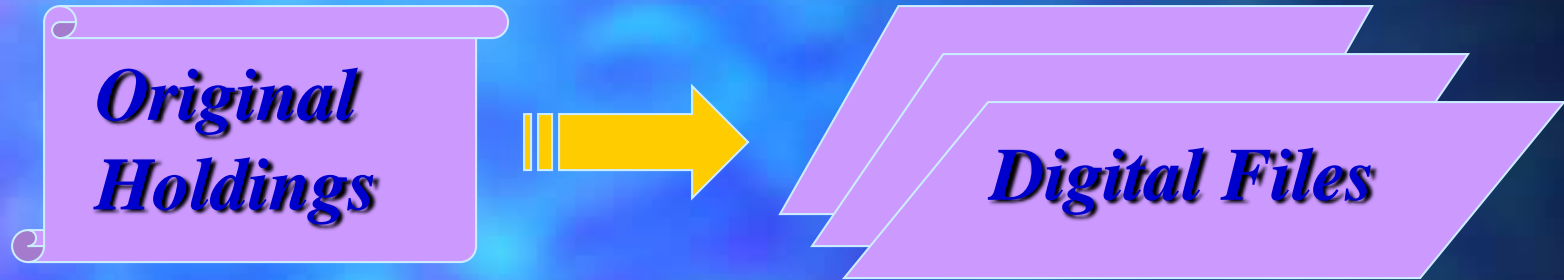
Education and learning

Research and development

Public information systems for knowledge and information sharing

Boost up creativity, productivity and quality of life

Culture Industry

Value-added Industry

Content Industry

Software Industry

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Important Issues

- Intellectual property right
- Time and space coordinates
- Multi-lingual issues
- Public information
- Technical standards
- Metadata and content markup
- Cooperation and collaboration

Concluding Remark

- The Internet speeds up the coming of a new civilization.

- The trend of shifting major media from paper to digital is unavoidable. Under this circumstance, cultural issues are the most priority we must solve.

- Digital Archive/Museum/Library projects provide a good start to address cultural issues.

Concluding Remark

- The Digital Archive Project has great cultural and social impact in many ways
- Cooperation/collaboration is the key success factor to solve cultural issues.

The End

Thank you very much !

綜觀問題:

- 這些問題都不是純粹的科技問題，*是應用資訊科技於社會時，與人文和社會現況互動所產生的結果*。

- 是應用資訊科技時的眼光、價值取向、態度、方法以及規劃、創意發生問題。

- 如果不明白資訊和資訊科技的本質，不了解現代文化思潮的內容和趨勢，無視於科技與文化互動可能對社會帶來的改變和衝擊，那麼將導致嚴重的社會問題

因應之道：健全的資訊素養

- 建立新觀念
- 多了解環境的變遷和未來的趨勢
- 培養操作設備的技術
- 增強溝通及應用資訊的能力
- 加強本科的學識與技術水準
- 資訊倫理的培養
- 了解過渡時期的失序現象