

# **Towards An Information Utility**

**Prof. V. Rajaraman**  
**(IT Advisor IIM Kozhikode)**  
**IBM Professor of Computer Science**  
**Indian Institute of Science Bangalore**

# INFORMATION UTILITY

- What is an Information Utility?
- What are the unique advantages of a computer based information utility?
- What are the relevant Technologies?
- How will it affect the society?

# WHAT IS INFORMATION UTILITY

- Information sources stored in secondary stores of computers geographically connected by high speed links
- Access from any place at any time – uniform standards for storage and organization of information
- Regulations on storage, retrieval and charging for use

# LIBRARY ON DEMAND

- Library comes to you at your place of study (anywhere, any time mobile computers)
- Information of all types digitized and stored
  - Text, graphics, audio, video
  - Information indexed and linked
  - Non-Linear reading
  - Geographically dispersed
  - Computer assisted search
  - Intelligent Agent – Alerts user based on/his her profile

# INFORMATION UTILITY

Existing Library – Mainly hard copy based

- Library – Books, Periodicals
  - Microfilms, Microfiche
  - Audio, Video tapes
  - Professionals to help in retrieval
  - Catalogues, indexing, classification
- Information Services
  - Selective dissemination of information
  - Citation data

# INFORMATION UTILITY

- Problems
  - One person only can use at a time a book/periodical
  - Misplacing – A Perpetual Problem
  - Handling difficulty – Rare Manuscripts Brittle
  - Storage Cost very high
  - Poor utilisation of non-text material

# OTHER INFORMATION REQUIREMENTS

- Govt.rules/regulations
- Daily stock prices
- Daily commodity prices
- Public transport schedule
- Daily Entertainment schedule

These are variable and transient

# ENABLING TECHNOLOGIES

- Storage
  - Hard disk 100s of GBs – Doubles every year
  - CDROM 500 MB (500 Page book 0.25MB)
  - DVDROM
  - Juke Box stores
- Bandwidth – Doubles every 9 months
- Computer Networks
  - Internet
  - Intranet
  - Wireless nets



# ENABLING TECHNOLOGIES

- Digitizing and compressing
- Powerful Processors – speed doubles every 18 months
- Window Base display
- Scanning Devices
- Digitizing
- Text – scan – bit map (1000KB/page  
(Best to convert to ASCII))
- ASCII (2KB/Page)

# ENABLING TECHNOLOGIES

- Numeric Data – Tables live (can manipulate)
- Graphics - Photos, Maps- scanned and stored - tif, gif, jpeg formats
- Audio - Digitized compressed (MP3)
- Video – Digitized and compressed (MPEG-2 90 min. video in 7 GB)

# ENABLING TECHNOLOGIES

- Indexing
- Keywords selected and Logically linked
- Hypertext, hyper links seamless access to data distributed on the web
- Standard html, Xml
- Internet Infrastructure
- World wide web
- Semantic web

# PROFILE OF EMERGING LIBRARIES INFORMATION UTILITIES

- Variety of holdings - Text
- Hypermedia - Multimedia
- Digitized
- Compressed
- Indexed & linked – hypertext
- Time varying collection
- Time varying contents
- Distributed

# PROFILE OF EMERGING LIBRARIES INFORMATION UTILITIES

- Networked
- Interactive
  - Multiple views
  - Easy cut and paste from multiple sources
- Delivered to user “on Demand” at his/her workspot
- Out of print, out of copyright books – Google books, Open Content Alliance (Oct.2005)

# PROFILE OF EMERGING LIBRARIES INFORMATION UTILITIES

- Some unrefereed material (ftp sites/web pages)
- Multiple simultaneous access to any document
- Allows collaboration among users
- Search engines – Google, MSN, Yahoo
- Intelligent agent - Softbots
- Alerts user based on his/her profile.

# UNIQUE ADVANTAGES

- Many can refer at a time
- No wear and tear
- Rare manuscripts may be accessed
- Data alive (can be processed)
- Unconventional data (e.g. data from scientific experiments, spectra)
- Famous lectures/concerts etc.
- Current information (quick dissemination)

# UNIQUE ADVANTAGES

- Catalogues, Data sheets on components
- Collaboration of scientists with similar interests world wide
- Electronic journals
- Ease of search



# HOW WILL IT AFFECT US

- Need to have internet access
- Self-publication
- Faster access – journals in digital form
- Collaboration
- Web presence important

# INTELLECTUAL PROPERTY ISSUES IN AN INFORMATION UTILITY

## In Print Era

- Copy right laws traditionally balance public good and private interest by
  - Allowing public access to limited number of copies by public libraries
  - Providing controls to authors/publishers on protection of their intellectual property for a limited period

# INTELLECTUAL PROPERTY ISSUES IN AN INFORMATION UTILITY

- Older technologies protect information as
  - Copying require physical handling
  - Copies being not “perfect”
  - Expense involved in copying and distribution high

# IN THE DIGITAL AGE

- Access implies copying
- One copy in digital form is sufficient to satisfy millions of readers
- Copies perfect reproduction indistinguishable from the original
- Low cost reproduction
- Distribution instant at negligible cost

## IN THE DIGITAL AGE

- Natural barriers to copyright infringement removed
- Access universal – almost at every home
- Individual behaviour in privacy of homes become problems to IPR enforcers

# CONSEQUENCES ON IPR

- Licensing to use rather than selling
- Sale implies ownership – second sale allowed legally – Allows distribution for private use.
- Licence terms specified unambiguously
- Public access restricted
- Licensing period extinguishes availability

# INTELLECTUAL PROPERTY MECHANISMS IN DIGITAL AGE

- Technical Solution
- Encryption
  - Decryption key unique, e.g., serial number of computer
  - Copying restriction of decrypted data
- Can read but not print or copy

# INTELLECTUAL PROPERTY MECHANISMS IN DIGITAL AGE

- Business Solution
  - Make it easier and cheaper to buy than copy – iPod success story
  - Legal copies provide service, reliability and speed
  - Appeal to fairplay
  - Give away free – make money from services (Google advertisement model)
  - Give away free original – make money on updates



# INTELLECTUAL PROPERTY MECHANISMS IN DIGITAL AGE

- Give away free one product – make money on related product.
- Individual customization
- Low price for first copy – depend on volume sale – constant updates

# LEGAL PROTECTION DIFFICULT TO ENFORCE AGAINST INDIVIDUALS

## U.S. Government Initiatives on IPR

- Has overly tilted towards large business houses such as movie producers, publishers etc., to the detriment of general public's fair use of information as understood in old copyright laws.

# INTELLECTUAL PROPERTY MECHANISMS IN DIGITAL AGE

## Examples

- Digital millennium copyright Act (1998) prohibits even attempts to produce AIDS to decrypt encrypted data
- Using parts of data bases to create new ones prohibited without permission of original database creator
- Napster Case
- Gorkster case