

Chinese-European Workshop on Digital Preservation

Beijing (China), July 14 – 16, 2004

Why Digital Preservation? Needs and Challenges



Dr. Heike Neuroth

Research & Development

Göttingen State and University Library (SUB)

neuroth@mail.sub.uni-goettingen.de





ToC

- Long-term Preservation
 - Relevance for (scientific) libraries
 - Heterogeneity
- Model (?)
- Presentations
- Outlook



Long-term Presevation

- New forms of production, publication and distribution of scientific information
- Rapid change of technology, different/various ways of preservation
- Trusted repositories needed
 - well defined criteria (policy etc.)
 - certification? (e.g. DINI)
- Guarantee of trusted long-term preservation
- IPR, Digital Rights Management
- ...



...

Digital Preservation consists of processes to ensure that digital resources remain **accessible**, **usable** and **understandable** in the future.

→ To ensure that future software and hardware tools will generate an authentic and integral representation of the object



...

What is meant by „**long term**“?

→ Definition by Ute Schwens / Hans Liegmann:

- In terms of preserving digital resources, ‚long-term‘ does not mean issuing a guarantee for five or fifty years, rather the **responsible development of strategies** which can cope with the constant changes brought about by the information market.



How much information?

- UC Berkeley's School of Information Management and Systems: How much Information?
 - Analyse of year 2002 to estimate the yearly increase of new (digital and analog) information
 - physical/storage media: print, film, magnetic, optical
 - information flows: telephone, radio, TV, Internet

[October 2003]



- **5 exabytes** of new information in 2002
(= 0,5 Mio x Print-Collection of LoC)
 - storage media – magnetic:
80% increase, of which **92 %** are stored on hard disc!
 - information flow – Internet, only surface (!!):
170 terabytes of information (= 17 x LoC)
- **30 %** Increase of digital information per year
(so far)

Table 1.2: Worldwide production of original information, if stored digitally, in terabytes circa 2002. Upper estimates assume information is digitally scanned, lower estimates assume digital content has been compressed.

Storage Medium	2002 Terabytes Upper Estimate	2002 Terabytes Lower Estimate	1999-2000 Upper Estimate	1999-2000 Lower Estimate	% Change Upper Estimates
Paper	1,634	327	1,200	240	36%
Film	420,254	76,69	431,690	58,209	-3%
Magnetic	4,999,230	3,416,230	2,779,760	2,073,760	80%
Optical	103	51	81	29	28%
TOTAL:	5,421,221	3,416,281	3,212,731	2,132,238	69%

Source: *How much information 2003*



Table 1.14: World Distribution of Internet Users (in millions)

Africa	6.31
Asia Pacific	187.24
Europe	190.91
Middle East	5.12
Canada and USA	182.67
Latin America	33.35

Source: *Nielsen / NetRatings via CyberAtlas*

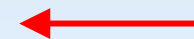
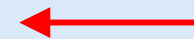
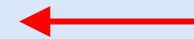



Table 1.13: The size of the Internet in terabytes.

Medium	2002 Terabytes
Surface Web	167
Deep Web	 91,850
Email (originals)	440,606
Instant messaging	274
TOTAL	532,897

Source: How much information 2003

10 TB = Print-Collection of LoC



Relevance

- (Scientific) libraries have to provide long-term access to scientific resources
 - regardless of the format
 - regardless of the document type
 - across all disciplines
- In Germany: DFG (German Research Foundation)
 - SSG libraries have a mandate to provide access to subject-specific scientific objects and to preserve them



Heterogeneity: Document-Types

- Journals and monographs at SUB (ca. 1.5 Mio)
 - retrodigitized material (e.g. Springer)
 - genuin digital material
 - different formats: PDF, TEX, TIFF, etc.
- Web-Documents, Web-Server
- Preprint-Server, Theses, e-Proceedings, etc.
- Primary data
- CD's
- ...



Heterogeneity: Format-Types

- Depends on subject, e.g.
 - Mathematics (TEX, PS, ...)
 - Geography (GIS)
 - ...
- Multimedia, e.g.
 - Animated WWW pages
 - Interactive objects in e-Learning
- Different versions in e.g. PDF, TEX, ...
- ...
- **Presentation Format + Preservation Format**



Heterogeneity: General

- Metadata formats (Dublin Core, MODS, ..)
- Exchange formats (XML, METS, XML/RDF, ...)
- Controlled vocabulary systems (Ontologies, Taxonomies, ...)
- Architecture, Protocols
- ...

Standardisation!

Interoperability!



Strategy

- Preservation policy
- Cooperation: international/national
- Cooperation: cross-domain
- Redundance of digital repositories explicitly desired
- Cooperative management/administration of distributed digital archives/repositories

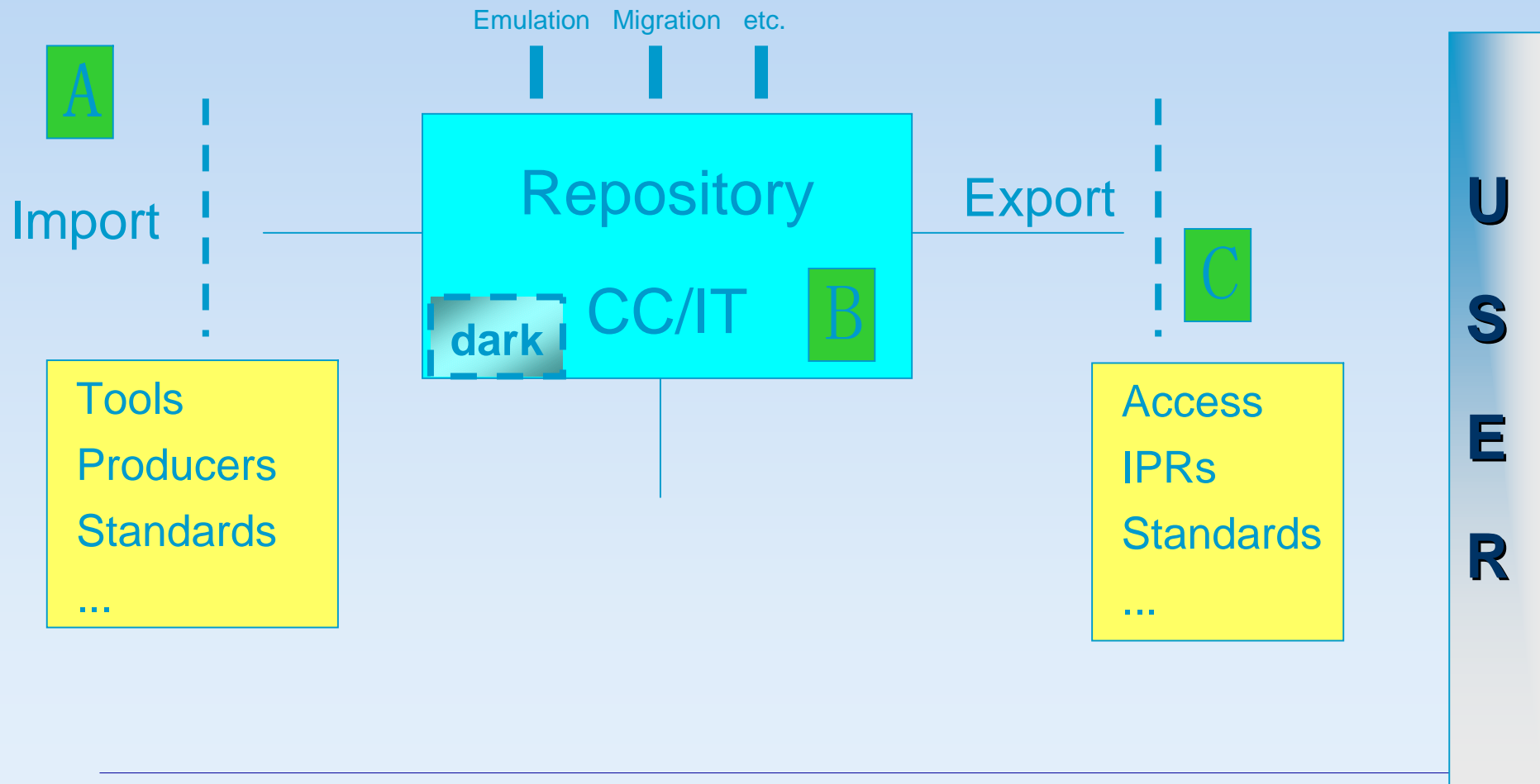


...

- Coordinated cooperation needed between:
 - Producer of digital objects (e.g. scientist)
 - Provider (e.g. library)
 - Distributor (e.g. publisher, hosts of db)
- International standards (e.g. DC, OAI, OAIS, METS), interoperability

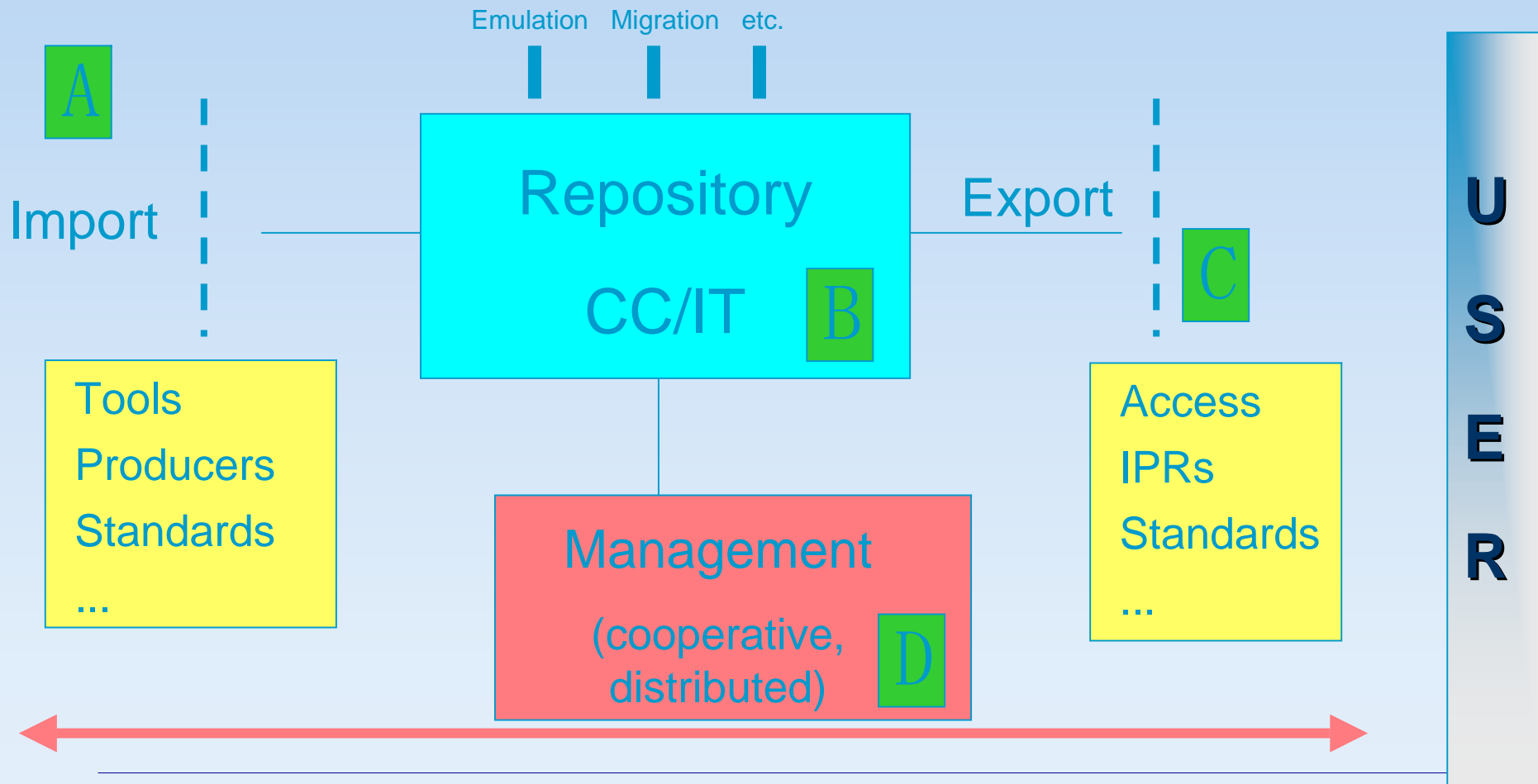


Model (?)



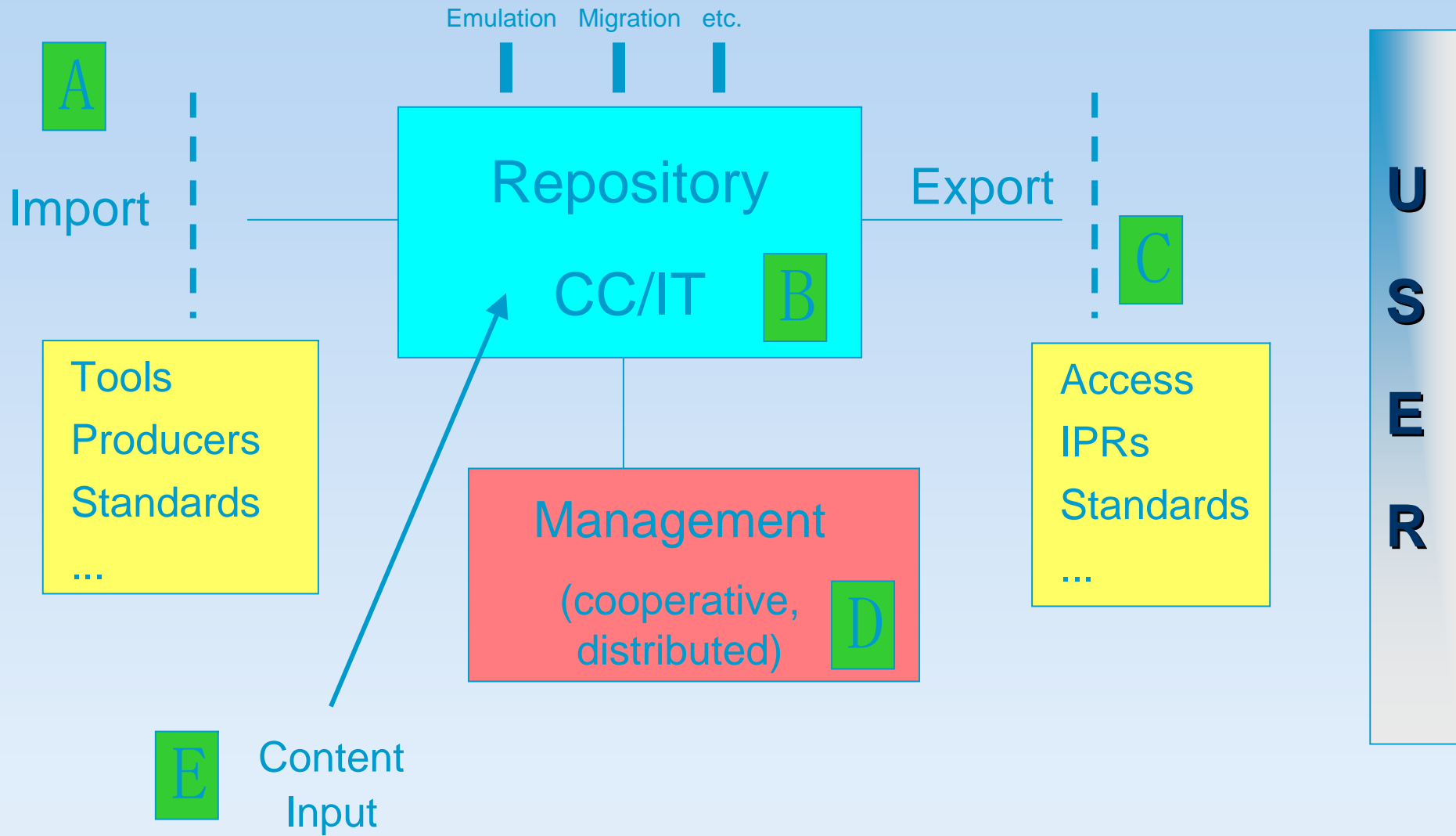


...

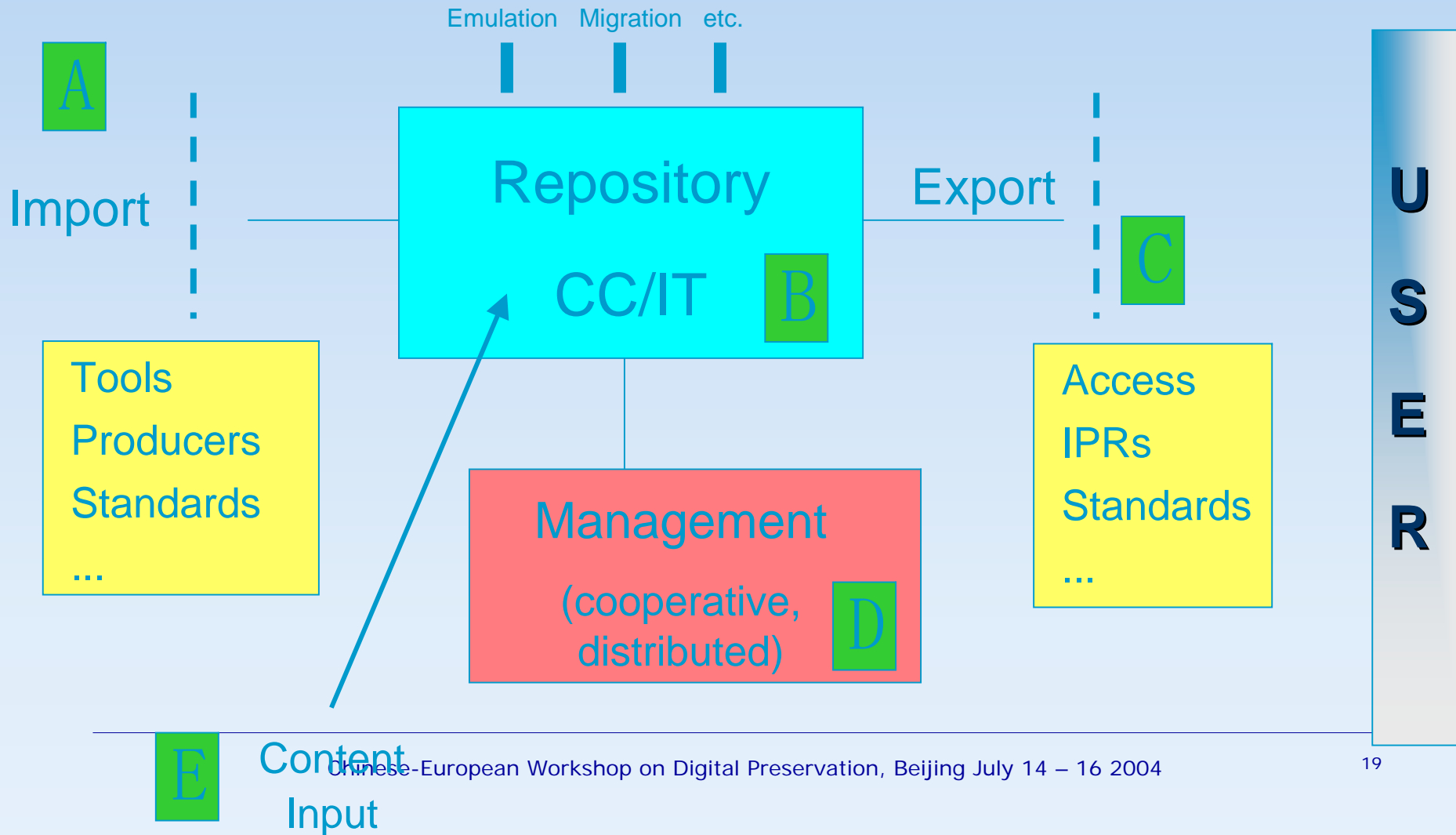




...



PRESERVATION POLICY





Presentations

- A: Import + E: Content Input
 - Preservation of Image Documents + Case Study
René
 - Preservation of E-Journals and E-Prints
Neil
 - Preservation of Scientific E-Journals: Case Study
Hilde
 - Preservation of Scientific Data in Natural Sciences
Thomas
 - Preservation of Scientific Data in the Humanities
René
 - Preservation of Web Information at the NL China, Case Study
Zhigeng



...

- B: Repository, Archival Storage System
 - Different approaches to Digital Preservation (Migration, Emulation)
Hilde
 - Metadata for Preservation
Michael
 - File Format Characteristics and Significant Properties
Andreas A.
 - The OAIS Reference Model, Current Implementations of the OAIS
Michael
 - Trusted Digital Repositories, Certification
Reinhard & Heike



...

➤ C: Export

- Are there already some experiences?

➤ D: Management

- Legal Aspects of Digital Preservation
Neil
- File Format Registries
Andreas A.
- Persistent Identifier
Reinhard
- Metadata Registries
Heike



➤ Preservation Policies

- Preservation strategies of the NL Netherlands
Hilde
- Using Utility Analysis to Evaluate and Compare Preservation Strategies
Andreas R.
- Preservation Strategy for Third-Party Materials of the Chinese Science Digital Library (CSDL) of the Chinese Academy of Sciences (CAS)
Xiaolin
- Preservation Planning, Institutional Strategies and Policies
Thomas



Outlook

- Common minimal set of preservation metadata
 - International
 - Standardized
 - Cross-domain
- Distributed management of digital archives, repositories
 - Nobody is able to preserve everything
 - Trusted repositories, certification (registry?)
 - Public preservation policies, strategies (registry?)



...

- Long-term objective: ***Interoperability***
 - Architecture, metadata, exchange format, protocol,
...
- But also:
 - Granularity of digital object?
 - Collection Level Description
 - Digital Rights Management
 - Terminology
 - Sensitisation (e.g. EU)
 - ...
- ***International*** Cooperation, Conferences, Initiatives



国家科技图书文献中心
National Science and Technology Library

NATIONAL LIBRARY OF CHINA



中国高等教育文献保障系统
China Academic Library & Information System

CSDL

中国科学院国家科学数字图书馆
Chinese National Science Digital Library

首页 关于我们 FAQ

Thank you very much
for your attention



Dr. Heike Neuroth
Research & Development
Göttingen State and University Library (SUB)
neuroth@mail.sub.uni-goettingen.de

Österreichische
Nationalbibliothek

