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# Chinese Digital Archive Network of Foreign STM Literature



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# Digital Archive Network of Foreign STM Literature

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- 1. The Initiative
- 2. The Framework
- 3. The Implementation and Challenges



# Digital Archival Network of Foreign STM Literature

- 1. The Initiative
- 1.1 Background (1)
  - Digital information becomes the mainstream for major research and educational institutions
    - CALIS (Chinese Academic Info and Lib System, MoE)
      - 300 major academic libraries
      - Databases 300, e-journals 24000
      - e-books 200,000, ETD 150,000
      - Download 68m articles by CALIS 2005
    - CSDL (Chinese Science Digital Library, CAS)
      - Databases 53, e-journals 8000
      - e-books 20,000, ETD 150,000
      - Download 17 m articles by CSDL 2006



# Digital Archival Network of Foreign STM Literature

- **1. The Initiative**
- 1.1 Background (2)
  - Migration from print to e-only begins in big steps
    - For example,
    - Tsinghua U. Lib foreign print journals from over 3000 to 700 in 2007
    - CAS Lib cancels more than 700 of its duplicate foreign journals in multiple locations and beginning cancellation of Chinese print journals



# Digital Archival Network of Foreign STM Literature

- 1. The Initiative
- 1.2 Objectives (1)
  - To preserve digital STM publications for long-term availability
    - Targeted resources
      - Foreign scientific scholarly R&D publications
        - E-journals, e-proceedings, ETDs
      - Chinese scientific scholarly R&D publications
        - E-journals, e-proceedings, ETDs
    - Targeted user groups
      - Chinese scientific research and educational communities



# Digital Archival Network of Foreign STM Literature

- **1. The Initiative**
- 1.2 Objectives (2)
  - To build a network of digital archives
    - With multiple distributed partners
    - Each serving at a national archive status
    - Each entrusted as a trusted public archive
    - With divided responsibilities to preserve different foreign STM digital resources
    - With public responsibilities to serve the research and educational communities
    - With built-in redundancy and succession chain



# Digital Archival Network of Foreign STM Literature

- **1. The Initiative**
- 1.2 Objectives (3)
  - Organized as a closely coupled virtual organization
    - With coordinated planning for the network
    - With government investment as the main funding
    - With collective preservation rights negotiation
    - With standard requirements for public service agreements
    - With standard guidelines for archive administration
    - With standard guidelines for archive interoperability
    - With centralized certification and evaluation



# Digital Archival Network of Foreign STM Literature

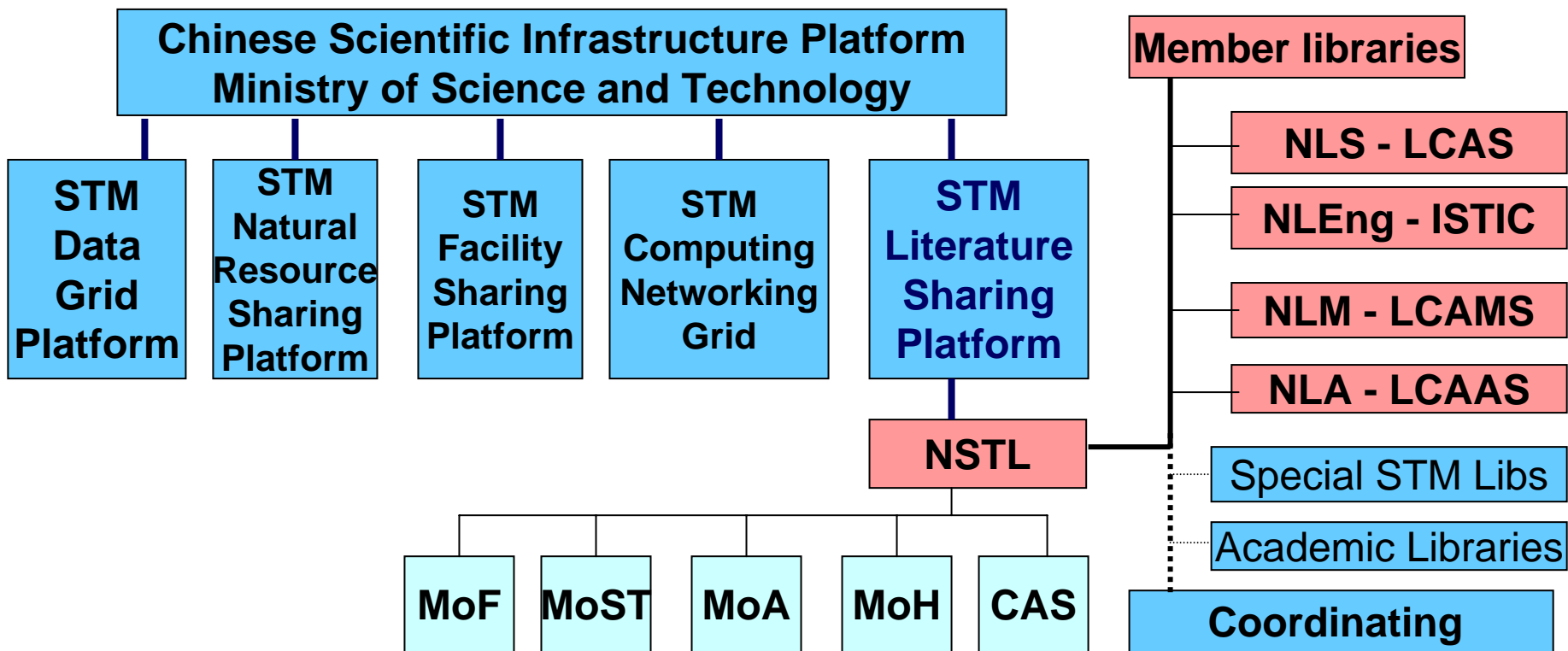
- **1. The Initiative**
- 1.3 Structure (1)
  - Supported by MoST
    - As part of National Scientific Infrastructure Platform
    - With collaboration from MoF, MoE, MoC, MoA, MoH, CAS, NSFC
  - Managed by NSTL
    - Status: as a standing program for funding and management
    - Administration:
      - A steering group for planning and overseeing
      - A administration Center within NSTL for administration
    - Participation:
      - A group of institutions designated as trusted operators of archives within the network
      - Competitively selected by open bidding and certification





# Digital Archival Network of Foreign STM Literature

- 1. The Initiative
- 1.3 Structure (2) - NSTL





# Digital Archival Network of Foreign STM Literature

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- 1. The Initiative
- 2. The Framework
- 3. The Implementation and Challenges

# Digital Archival Network of Foreign STM Literature

- 2. The Framework
- 2.1 General framework

Preserving what?

Prioritize the resources

Who preserves the resources?

Design the responsibility network

How to preserve the resources?

Develop the requirements (IPR, technical, workflow, service, ...)

How to manage the processes?

Implement administrative means (funding, certification, fail-safe...)

How to sustain the processes?

Institutionalize long-term policy & Planning mechanism



# Digital Archival Network of Foreign STM Literature

- **2. The Framework**
- 2.2 Selection of the targeted resources (1)
  - Value and Crisis analysis
    - Key R&D resources
    - Resources in nationally strategic fields
    - Most used or subscribed resources
    - E-only resources
    - Important resources subscribed by few
    - Resources with easier preservation arrangements
    - .....



# Digital Archival Network of Foreign STM Literature

- **2. The Framework**
- 2.2 Selection of the targeted resources (2)
  - Targeted resources
    - Major STM publishers' e-journals
    - Major STM societies' e-journals
    - Important university presses' e-journals
    - Major STM publishers' e-books/proceedings
    - Major STM ETD databases
    - Major patents/standards/reports databases
    - Major STM abstract/index databases
    - Major reference works
    - .....



# Digital Archival Network of Foreign STM Literature

- **2. The Framework**
- 2.3 Securing the preservation rights (1)
  - Preservation rights as a national and public rights
    - Negotiated as national archive rights
    - Negotiated as part of public investment requirements for subscription
  - Multi-facets of preservation rights
    - Rights to ingest and preserve
    - Rights to modify and processing for preservation
    - Rights to serve designated populations or the public



# Digital Archival Network of Foreign STM Literature

- **2. The Framework**
- 2.3 Securing the preservation rights (2)
  - Further analysis of preservation rights
    - Rights to ingest and preserve
      - Rights on behalf of the public and other partners
      - Rights for redundancy back-up and succession
      - Rights for full metadata and full support in ingesting and preserving the data
    - Rights to serve
      - Rights to serve when service is unavailable to the subscribing body
      - Rights to serve the collaborating partners when regular service is unavailable to them
      - Rights to serve the public when the market fails
  - Guidelines and approvals for rights negotiation



# Digital Archival Network of Foreign STM Literature

- **2. The Framework**
- 2.4 Implementing the tech infrastructure
  - Basic tech requirements
    - Following the OAIS model
    - Using multiple OSS-based and well populated systems
    - Adopting standard SIP/AIP/DIP formats and metadata
    - Supporting well-formed workflows
    - Utilizing standard S&R interfaces
    - Implementing standard modules for monitoring and auditing
  - Special tech requirements
    - Redundancy back-up capability
    - Succession workflow capability
    - Open access control management
    - Fast serviceability within limited time periods





# Digital Archival Network of Foreign STM Literature

- **2. The Framework**
- 2.5 Planning the preservation workflow management
  - Workflow
    - Clearly defined with desired details
    - Well documented
    - Verifiable
    - Coupled with responsibility systems
    - Supported by necessary resources
    - With corrective measures
  - Trusted workflow management
    - Built-in workflow planning, designing, control, evaluation, and modification in preservation administration
    - Following common standards and guidelines
    - Exposed to outside evaluation and certification
    - Supported with automatic workflow analysis and management



# Digital Archival Network of Foreign STM Literature

- 2. The Framework
- 2.6 Planning trusted service management
  - Service
    - Sustainability of the shared responsibility relies on well-performed services to each other and to the public
    - Contract with NSTL as service level agreement
  - Specified acceptable service levels
    - Performance standards for archiving
    - Performance standards for services
      - Response time for service when needed
      - Service functionality
      - Service reliability
      - Service without undue access control limitations
      - Service without undue financial charges
  - Trusted lawful legal practices
  - Subject to Open evaluation



# Digital Archival Network of Foreign STM Literature

- **2. The Framework**
- 2.7 Selection of the preservation partners (1)
  - General framework for the trusted partners
    - Entry criteria for the partners
      - Responsibilities, obligations, competencies, resources, ..
    - Competitive selection process
      - Open bidding
      - Certification standards in initial evaluation
      - Shared investment
      - Built-in fail-safe redundancy in responsibility
  - Rigorous management of the partners
    - Contractual management
    - Periodic evaluative re-certification
    - Performance binding with public investment
    - Compulsory succession mechanism



# Digital Archival Network of Foreign STM Literature

- 2. The Framework
- 2.7 Selection of the preservation partners (2)
  - General criteria for the trusted partners
    - Legally independent organizations
    - Public research and education institutions
    - With sufficient formal organizational commitment
    - With sufficient organizational and financial sustainability
    - Subscriber to the targeted resources
    - Subscriber with service responsibility to the primary users
    - With statutory and historical responsibilities
    - With proved public and collaborative service competencies
    - With tested technological and administrative competencies
    - Enabling distributed responsibilities, especially among major library systems
    - .....



# Digital Archival Network of Foreign STM Literature

- 2. The Framework
- 2.7 Selection of the preservation partners (3)
  - Possible partners
    - National Libraries (especially national STM libraries)
    - Major research universities
    - Major national research organizations
    - Major public libraries
    - (with support from data centers in universities and research organizations)
  - Possible division of labor
    - According to the subject emphases
    - Necessary concentration of resources for economy of scales
    - Necessary distribution of resources for reliability
    - .....



# Digital Archival Network of Foreign STM Literature

- **2. The Framework**
- 2.8 Funding structure for the network
  - Public funding as the basis and the enabler
    - Public responsibility of the government to preserve
    - MoST funding as part of the National Scientific Info Platform
  - Shared funding
    - MoST funding for initial development, continuing extension, and part of continuing operation
    - Institutional funding for part of the initial development of the assigned archives and for continuing maintenance (staff, facilities, administration, ...)
    - Maybe combined with NSTL support of resource acquisition
  - Performance binding funding
  - Specific funding management at NSTL and institutions



# Digital Archival Network of Foreign STM Literature

- **2. The Framework**
- 2.9 Certification and evaluation mechanisms
  - Certification processes
    - as a prerequisite for selection of partners
    - as a periodic evaluation and management tool
  - Certification
    - by outside bodies authorized by MoST for official evaluation
    - by expert groups organized by NSTL for management
  - Certification management
    - Standards utilizing global experiences
    - Standing procedure and budget for certification
    - Open certification and evaluation standards
    - Enforcement mechanisms for evaluation results



# Digital Archival Network of Foreign STM Literature

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- 1. The Initiative
- 2. The Framework
- 3. The Implementation and Challenges





# Digital Archival Network of Foreign STM Literature

- **3. The Implementation and Challenges**
- 3.1 Phased implementation (1)
  - Secure approval for the initiative as official endeavor and initial funding from MoST for the experiment phase
  - Secure commitment from Most for future full-scale development
  - Secure commitment of collaboration from other go ministries and major partners



# Digital Archival Network of Foreign STM Literature

- **3. The Implementation and Challenges**
- 3.1 Phased implementation (1)
  - Explorative and Experimental Phase
    - Limited scale experimental archive development with
      - 1 general foreign full-text database
      - 2-3 subject-based or special type foreign databases
      - 1 Chinese full text database
    - In-context explorative administrative development with
      - Resource selection planning
      - Preservation rights management
      - Service level agreement guidelines
      - Workflow management guidelines
      - Certification standards and processes
      - Funding estimates and management
    - Building up the collaborative culture and channels



# Digital Archival Network of Foreign STM Literature

- **3. The Implementation and Challenges**
- 3.1 Phased implementation (2)
  - Production implementation phase
    - Resource selection plan
    - Rights management plan
    - Funding planning
    - Selection by Certification
  - Full scale preservation efforts for major resources
  - Full life-cycle operations for early experimental resources
  - Full scale development of the network management
  - .....



# Digital Archival Network of Foreign STM Literature

- **3. The Implementation and Challenges**
- **3.2 Challenges (1)**
  - To mobilizing STM communities and relevant gov agencies
  - To advocate shared responsibility in a distributed network
  - To educate about trusted preservation services
  - To develop convincing funding structures and formulas
  - To devise shared service structures and management
  - To train capable technical and managerial personnel
  - To showcase successful trusted archiving systems
  - .....



# Digital Archival Network of Foreign STM Literature

- **3. The Implementation and Challenges**
- 3.2 Challenges (2)
  - Working with multiple lines of administration and interests
    - Universities by MoE
    - Research organizations by CAS or other ministries
    - Public libraries by MoC and local governments
    - NSTL by MoST
    - .....
  - Need to involve all (would-be preservers and beneficiaries) from planning to evaluation



# Digital Archival Network of Foreign STM Literature

- **3. The Implementation and Challenges**
- **3.2 Challenges (3)**
  - **Policies**
    - Adjustment of policies of MoST and NSTL for supporting a digital archival network of STM literature
    - Adjustment of policies of participating institutions to align with the MoST/NSTL policies
  - **Collaborations**
    - With scientific data preservation
    - With H&SS resources and cultural heritage preservation
    - With institutional knowledge assets management
    - With international partners in scientific communities
  - **Services**
    - Integration with current STM information services
    - Experimenting with enriched content and service context
    - .....



## Digital Archival Network of Foreign STM Literature

- **3. The Implementation and Challenges**
- Learning from our colleagues from the world is one of our important answers to the challenges
- We are indebted to those participated iPRES2004/2005/2006
- We hope we will be able to collaborate with colleagues abroad and within in China



# Digital Archive Network of Foreign STM Literature

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Thanks!

谢谢!