Global Knowledge Sharing and Roles of Educational Institutions

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Change of the World
and
Higher Learning Environment

● **Increasing diversity, complexity, and necessity of thoughtful mediation** in politics, economy, foreign policy and social systems; nation, ethnicity, language, culture, religion and other (increasing number of) dimensions for diversity and complexity.

● **Increasing speed and personalizability of communication media.**

● **Increasing size and complexity of databases,** or the amount and the structure of knowledge shared globally across borders.

Change of the World and Higher Learning Environment

■ **People who think and act independently and collaboratively at the same time.**

■ **Open and real-time communication** for understanding each other, and for discovering and solving problems in the world.

■ **Creation, accumulation and distribution of knowledge** logically and semantically robust enough against abuse of information, and spatio-temporally stable enough for peace, sustainability, and prosperity of our globe.

◆ Needs of learning environment for **nurturing people who can be both independent and collaborative**.

◆ Needs of globally distributed **infrastructure for global communication and knowledge sharing** based on innovative digital communication networks.

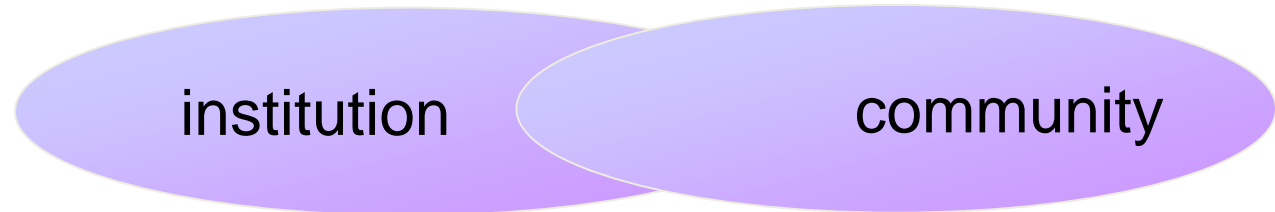# Innovation through Institution-Community Collaboration

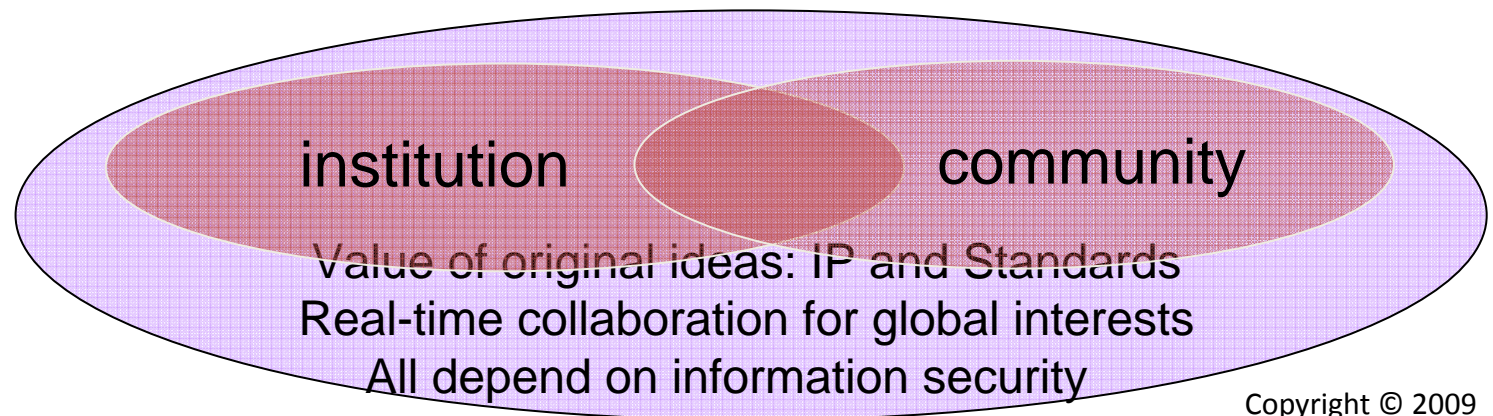Knowledge Source Model   Institution as Source of Knowledge
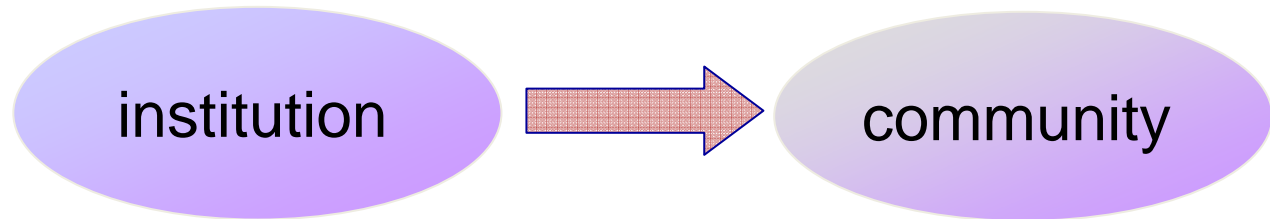
institution ➡ community

Knowledge Interaction Model   Interaction of Institution and Community

institution   community

Knowledge Globalization Model

Institution-Community Interaction in Knowledge-Sharing World

institution   community

Value of original ideas: IP and Standards
Real-time collaboration for global interests
All depend on information security

SOI (School On Internet) Asia
-based on satellite Internet technology

24 Partner Universities in 12 Countries

Thailand
Chulalongkorn University, Asian Institute of Technology, Chulachomklao Royal Military Academy, Prince of Songkla University

Laos
National University of Laos

Myanmar
University of Computer Studies

Indonesia
Brawijaya University, Sam Ratulangi University, Hasanuddin University Kampus Tamalanrea, Institut Teknologi Bandung, Universitas Syiah Kuala

Malaysia
Universiti Sains Malaysia, Asian Institute of Medicine, Science & Technology

Vietnam
Institute of Information Technology

Philippines
Advanced Science and Technology Institute, University San Carlos

Nepal
Tribhuvan University

Cambodia
Institute of Technology of Cambodia

Bangladesh
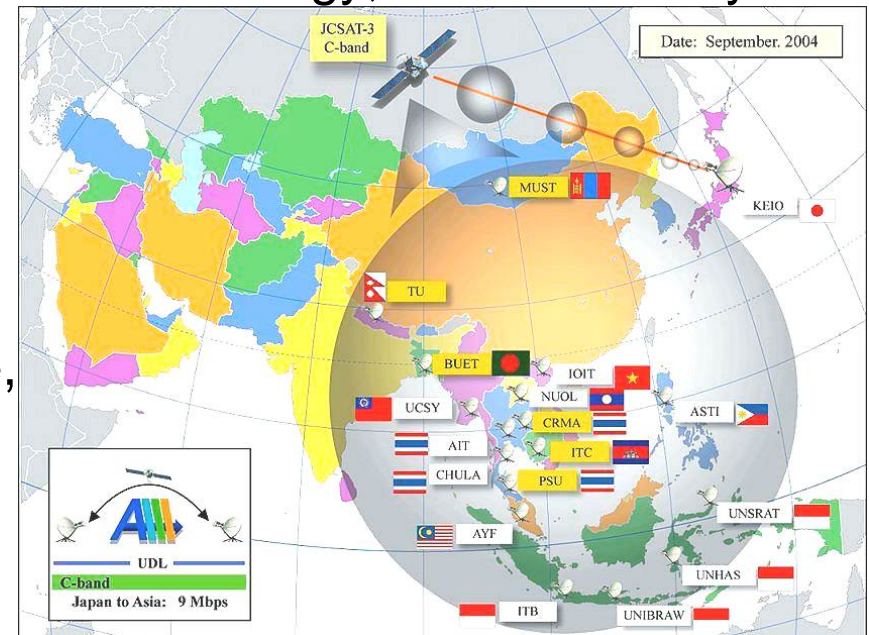Bangladesh University of Engineering and Technology

Mongolia
Mongolian University of Science and Technology

Japan
Tohoku University, Tokyo University of Marine Science and Technology, Japan Advanced Institute of Science and Technology, Keio University

Brawijaya University, Indonesia

Hasanuddin University, Indonesia

Sam Ratulangi University, Indonesia

Asian Institute of Technology, Thailand

National University of Laos, Laos

Advanced Science and Technology Institute, Philippines

University of Computer Studies, Yangon, Myanmar

Asian Youth Fellowship, Malaysia

Chulalonkorn University, Thailand

Institut Teknologi Bandung, Indonesia

Institute of Information Technology,, Vietnam

Universiti Sains Malaysia, Malaysia

Mongolian University of Science and Technology, Mongolia

Prince of Songklang University Thailand

Chulachomklao Royal Military Academy Thailand

Keio University Shonan Fujisawa Campus,Japan

Universitas Syiah Kuala, Indonesia

University San Carlos, Philippines

Bangladesh University of Engineering &Technology, Bangladesh

Institute of Technology of Cambodia, Cambodia

Tribhuvan University, Nepal

Understanding and Solving Real-world Problems
at SOI Asia -Tsunami Disaster Recovery Project

Keio University and SOI Asia assisted Universitas Syiah Kuala, the largest national university in Indonesia, by providing comm. env. for disaster recovery.
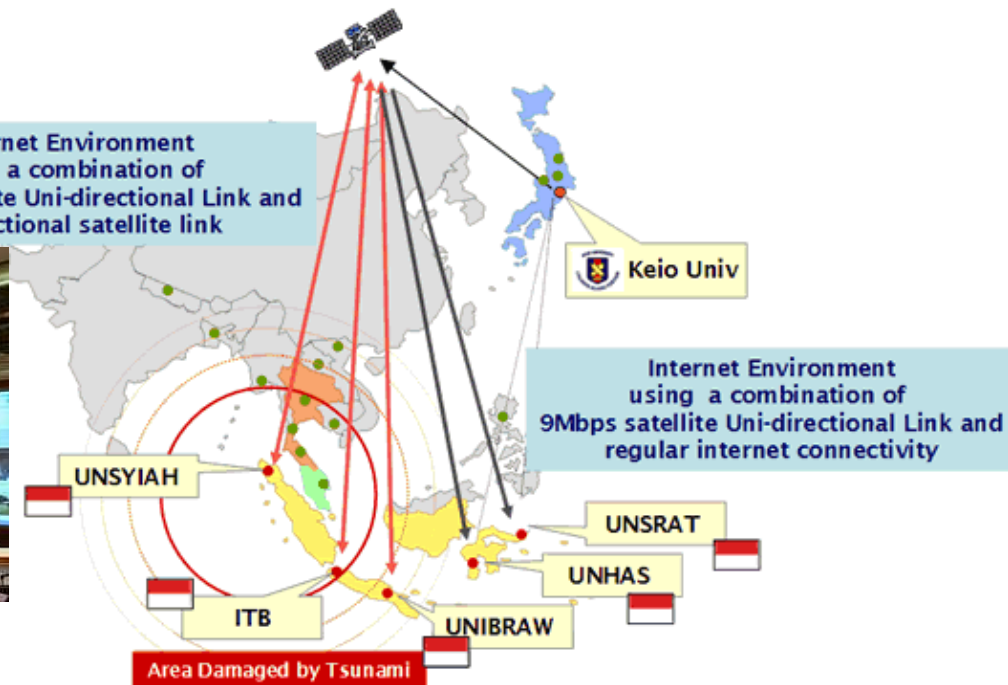
Photos by Chermg Talay Subdistrict Administration Office

Internet Environment using a combination of 9Mbps satellite Uni-directional Link and bi-directional satellite link

Keio Univ

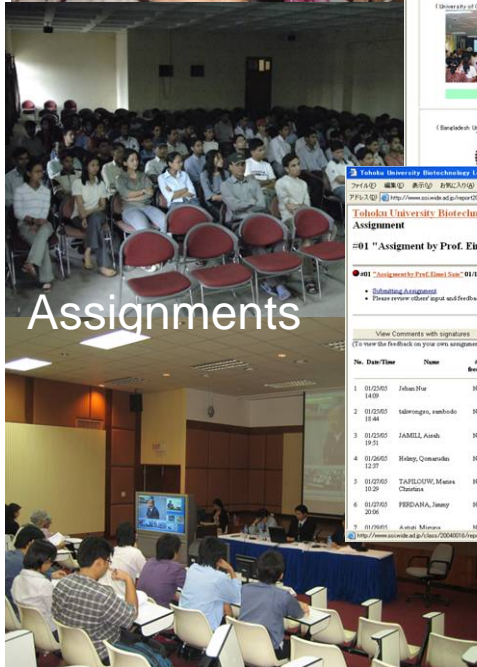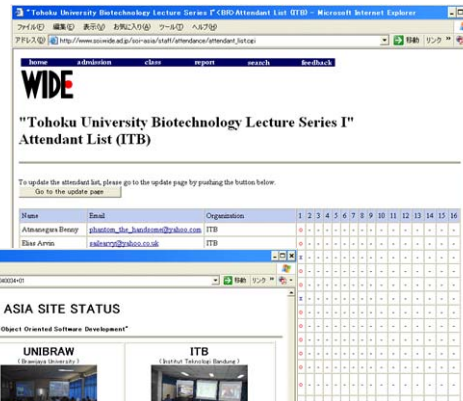Internet Environment using a combination of 9Mbps satellite Uni-directional Link and regular internet connectivity

UNSYIAH

UNSRAT

UNHAS

ITB

UNIBRAW

Area Damaged by Tsunami

Tsunami Symposium on SOI Asia network

Remote e-Learning System for SOI Asia

Attendance

Personal activity reports

Site status

Assignments

Q&A and Communication

Feedback

Industry-government-academia Collaboration for SOI Asia

Satellite Internet Infrastructure

Satellite Receiver (Product) and UDLR (Standard)

Technology Development
Internet via Satellite
2006~

JSAT

総務省
MIC Ministry of Internal Affairs and Communications

UDcast

SONY

Technology Development
Satellite and UDLR
2000~

総務省
MIC Ministry of Internal Affairs and Communications

SOI Asia Lecture Platform

IBM

Asia IT Training
2004~2005

MEXT

Content Development for Digital Media for Asia
2006

MEXT
Ministry of Education, Culture, Sports, Science and Technology

Industry/Government Partners

- Toyota Motor Corp.
- Toshiba Corp.
- NTT DoCoMo, Inc.
- Yokogawa Electric Corp.
- Matsushita Electric Industrial Co. Ltd.

- DENSO Corp.
- Fuji Xerox Co., Ltd.
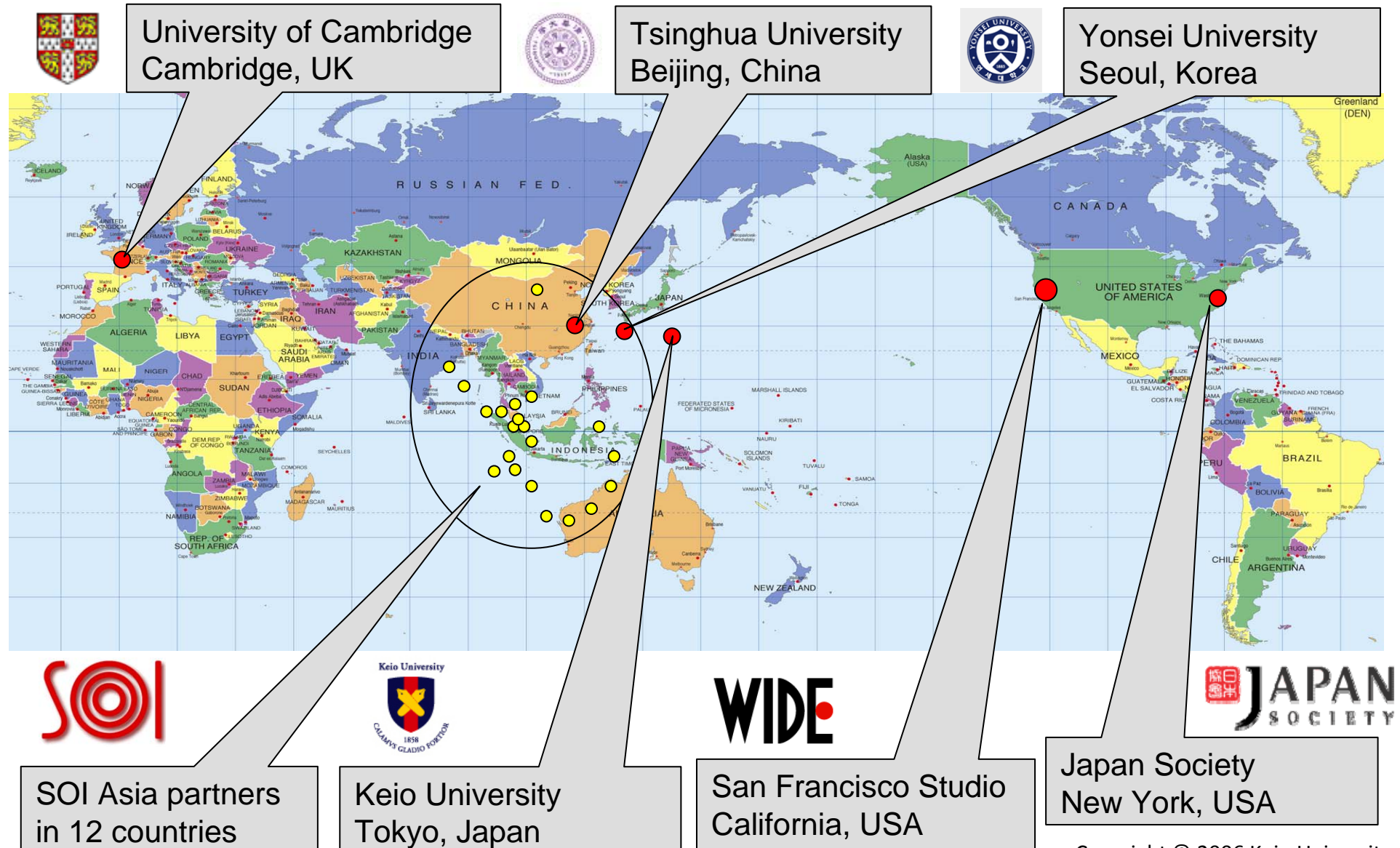- Fujitsu Ltd.
- Hitachi Ltd.
- Honda R&D Co., Ltd.

- IBM Japan, Ltd.
- KDDI Corp.
- Microsoft Corp.
- Ministry of Education, Culture, Sports, Science and Technology etc

Operator Training for SOI Asia

Annual SOI Asia Operators Workshop
(in 2005 at Brawijaya University, Indonesia, for the photo)

Global Digital Studios (as of 2006)

University of Cambridge
Cambridge, UK

Tsinghua University
Beijing, China

Yonsei University
Seoul, Korea

SOI Asia partners
in 12 countries

Keio University
Tokyo, Japan

San Francisco Studio
California, USA

Japan Society
New York, USA

What are Global Digital Studios?

- Studios are:
  - ✓ Standardized digital communication spots
  - ✓ With high quality digital video/audio facilities
  - ✓ Located in key places for handling digital content
  - ✓ Connected to each other through a global digital network
  - ✓ Shared by diverse education and research communities
  - ✓ Interoperable since they adhere to the same standard
  - ✓ Autonomously operated by each partner
  - ✓ Registered as shared resources among partners.
- Partner institutions can:
  - ✓ Make use of any/all registered studios for any convenient occasion through very simple procedures.

Examples of Self-operated Global Digital Studios

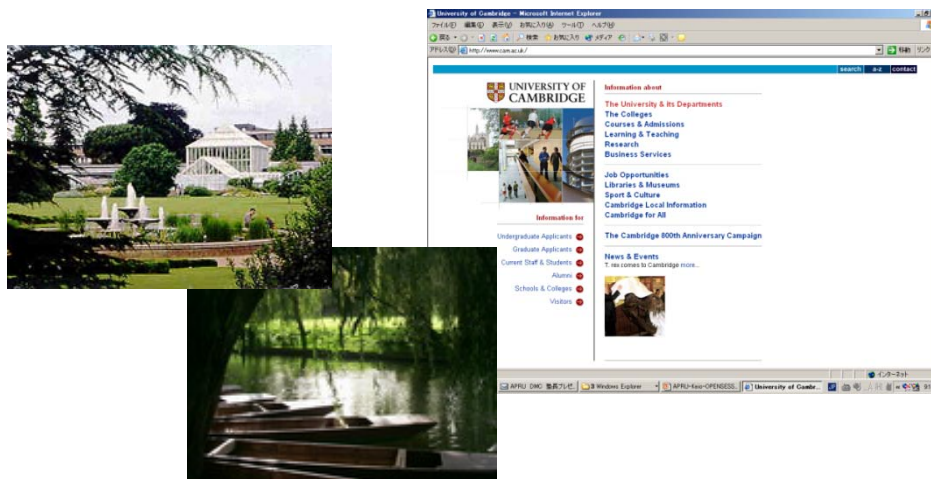## Studio at Tsinghua University

Location 1/3 Overview

FIT
Future Internet Technology
Research Center

清華大学主楼
Main Bld.

清華大学東門
East Gate

Studio at Yonsei University

Studio at University of Cambridge

Studio at Japan Society

Studio at Keio University

✓ Location: Tokyo, Japan
✓ Operated by: Keio University
✓ DVTS and Polycom / Multipoint capable
✓ IPv4/IPv6
✓ Re-constructed in February 2006

Global Digital Studios Provide Excellent Opportunities

Creation and Distribution of Contextual Digital Content

✓ **Digital content with context**, such as real-time images, video clips, audio tapes, movie programs, animation programs, sport, music, performances, scientific experiments or other scenes, books, journals, reports or other edited pages of documents, a series of digitalized pictures or photographs, promotion videos for universities, industries, governments, and so on.

Knowledge Sharing in the Global Community

✓ Contextual digital content could constitute an **enormous portion of our body of knowledge**, to be shared & used for many purposes in global & local communities.

Research and Development

✓ How to create, store, send, distribute, share, retrieve, edit, use, & profit from contextual digital content in a global community is an **open & challenging issue** for R&D in media technology, human-machine interaction, knowledge handling, business management, financing, legal systems & others.

Benefits for Society

✓ Industries for contextual digital content are generally **labor-intensive and/or cost-inefficient**; better technologies & management will produce greater benefits for society.

Human Resources

✓ There are **very few professionals** in universities, industries or governments who can design and manage contextual digital content and its large-scale platforms. Thus, universities need to take a decisive role.

Intellectual Property Rights and Standards related to Global Knowledge Sharing

✓Copyright Protection & Promotion of Distribution
  ✓Encouraging the improvement and clarification of contractual practices in business and academia
  ✓Supporting the development of content protection schemes

✓More control over copyright infringement
  ✓Establishment of a legal framework for dealing with trans-border copyright infringements
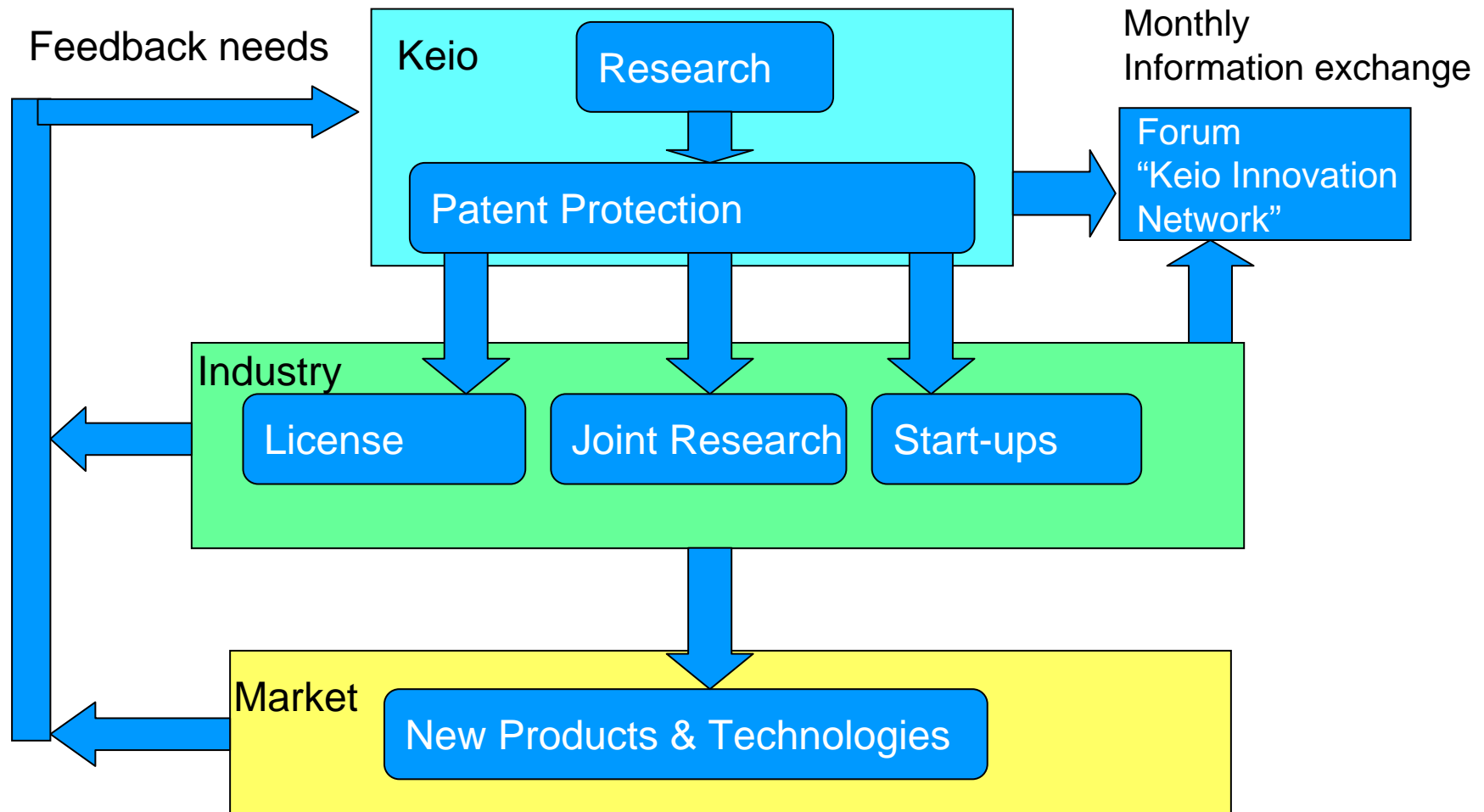 ✓Stricter control over P2P-based infringements

✓Proactive efforts for international standardization
  ✓Improving awareness of the importance of standardization, including training of standardization specialists
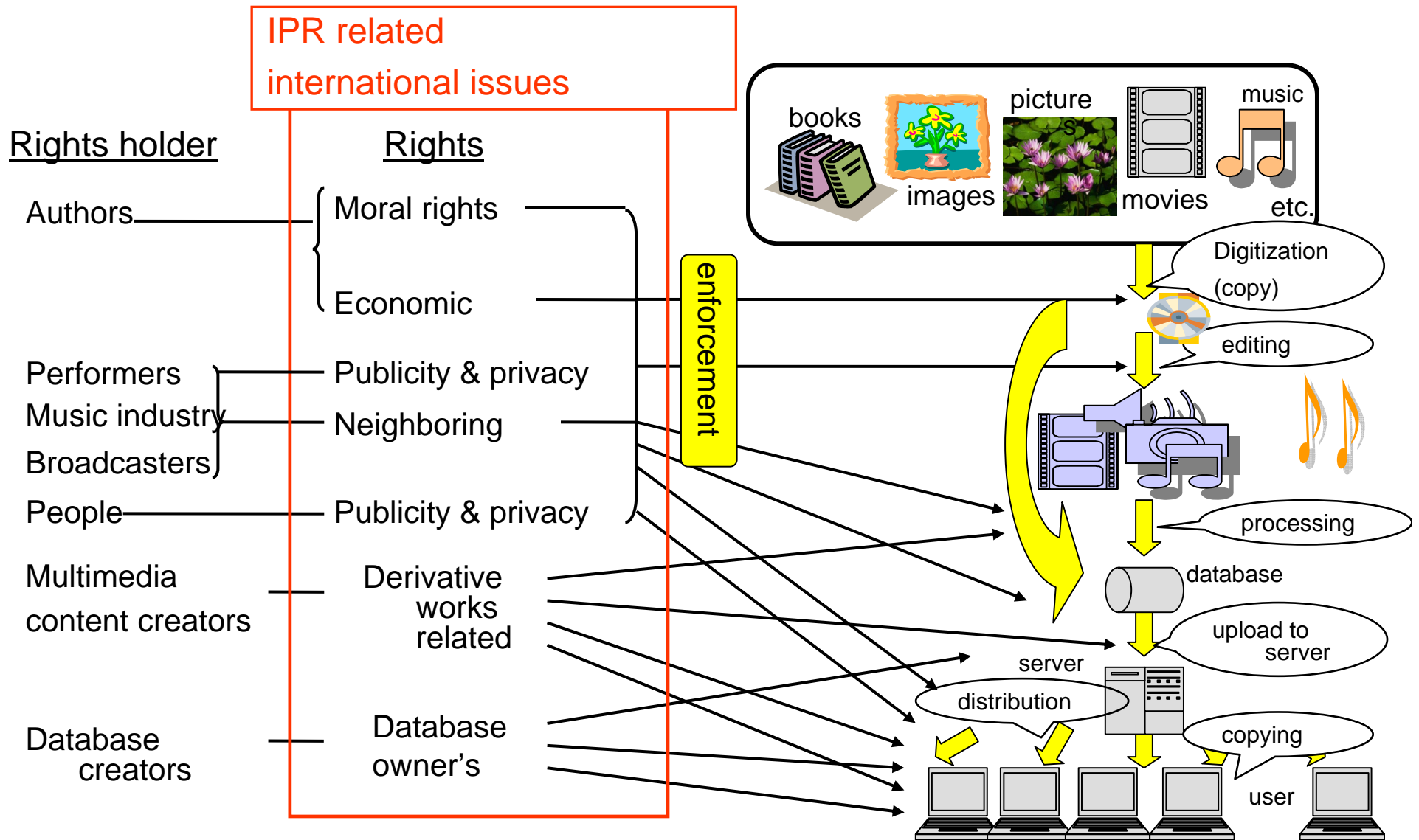 ✓Promoting collaborative research for the establishment of international standards
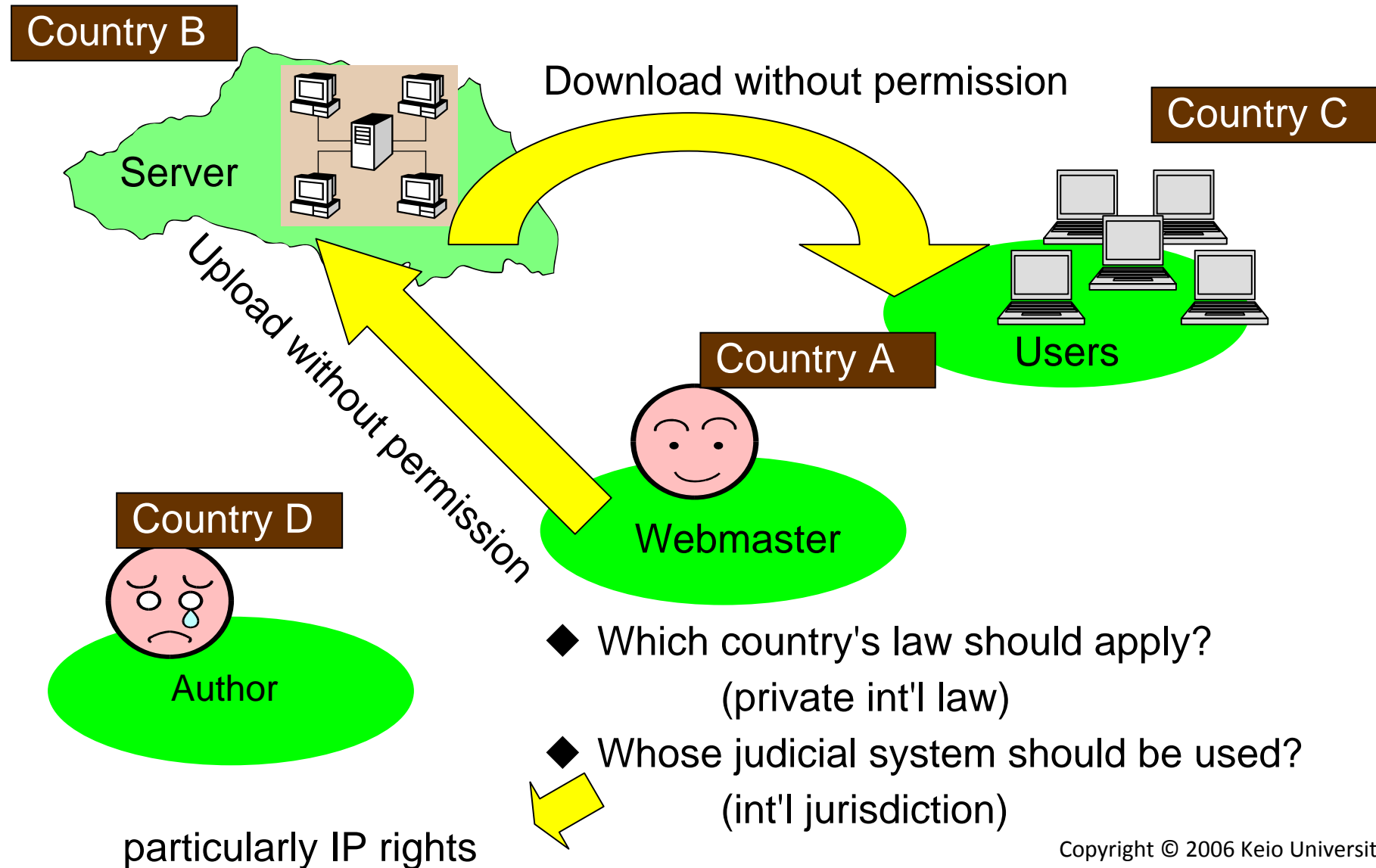
Intellectual Property Center at Keio University

Key Mission: to convert "research results" to commercial products & technologies
in order to disseminate Keio's knowledge to the public

Feedback needs

Keio

Research

Patent Protection

Monthly
Information exchange

Forum
"Keio Innovation
Network"

Industry

License

Joint Research

Start-ups

Market

New Products & Technologies

IPR related International Issues

IPR related
international issues

Rights holder

Rights

Authors

Moral rights

Economic

Performers
Music industry
Broadcasters

Publicity & privacy

Neighboring

People

Publicity & privacy

Multimedia
content creators

Derivative
works
related

Database
creators

Database
owner's

enforcement

books
images
picture
movies
music
etc.

Digitization
(copy)

editing

processing

database

upload to
server

server

distribution

copying

user

IPR related International Issues: An Example

Country B

Server

Download without permission

Country C

Users

Upload without permission

Country A

Webmaster

Country D

Author

particularly IP rights

◆ Which country's law should apply?
  (private int'l law)

◆ Whose judicial system should be used?
  (int'l jurisdiction)

Contribution to International Standardization: An Example

Contribution to International Digital Cinema Standard

✓ Approved as an international standard by DCI (Digital Cinema Initiative)

✓ Newest system adopting JPEG2000

✓ Can deliver hi-res Digital Cinema imagery (3840x2048)

4K Digital Cinema
"Birthday Cake"

Content Industries and Content Management Policy

Capture & production in digital

Post production, editing, encoding

Content storage

Delivery through the network

- Dedication to a specific area
- New competition & collaboration
- Alliance of industry and academia
- Paradigm-shift to a new business model
- Needs for strategy, leadership & policy to encourage momentum

Audience, subscribers

Content distribution, hosting service

Content rights management, new advertising scheme, new business model

Content Industries and Content Management Policy

Different types of content go digital in different ways

- ✓Text and Picture
  - ✓Text
  - ✓Picture
  - ✓Photo
  - ✓2D- and 3D- graphics

- ✓Sound
  - ✓Music
  - ✓Speech
  - ✓Lecture
  - ✓e-Learning text

- ✓Motion Picture
  - ✓Movie
  - ✓Video
  - ✓2D- and 3D-graphics
  - ✓e-Learning Content
  - ✓News
  - ✓Drama
  - ✓Animation

- ✓Multimedia Title
  - ✓TV Game
  - ✓Encyclopedia, Almanac
  - ✓Virtual Environment

Issues in Global Knowledge Sharing: Examples

- **Regulation against sending moving images** with pictures and sounds **for remote education**

- **Regulation against heavily repeated use** of commercial videos/films **for educational purposes**

- **Rapid shift to oligopolization** of copyrights and publication rights for academic products

- **Difficulty in cooperation** with content industries

- **Difficulty in coping with heavy load** to digitize paper and film products

- **Underdevelopment of secured global communication networks** with reasonable cost

- **Underdevelopment of international and domestic laws** for copyright, publication right, and distribution of information

- **Underdevelopment of protection systems** for information security

- **Difficulty in standardization** of formats and handling procedures for to-be-globally-shared materials

- **Others**

Global Knowledge Sharing: Roles of E&R Institutions
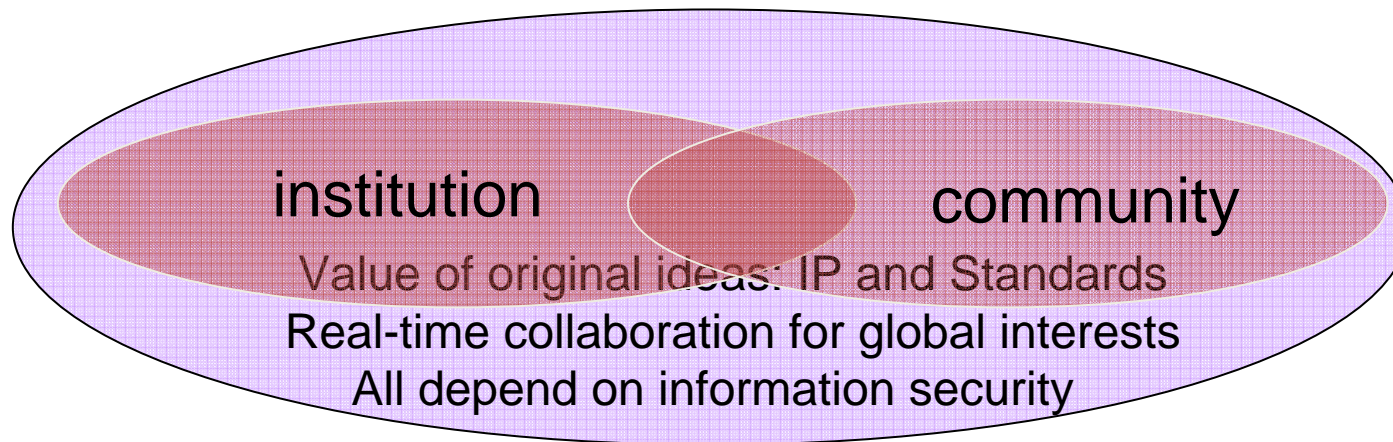
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Knowledge Globalization Model

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Value of original ideas: IP and Standards
Real-time collaboration for global interests
All depend on information security

◆ **Respect for Values of Originality and Creativity**
◆ **Nurturing Humans with Global Knowledge, Wisdom and Sincerity**
◆ **Globally Significant Academic Production and Archiving**
◆ **Social Innovation and Contribution to Global/Local Societies**
◆ **Collaboration for Solving Global/Local Issues**