Two ICT R&D directions learned by “Innovator’s Dilemma”

Masao SAKAUCHI

NII,Japan

3つの歴史的背景

ログローバル化と大競争時代

- ●研究･開発とイノベーションが死命を制す

ロサイエンス／ソーシャル／ビジネスソリューションの複雑･多元化

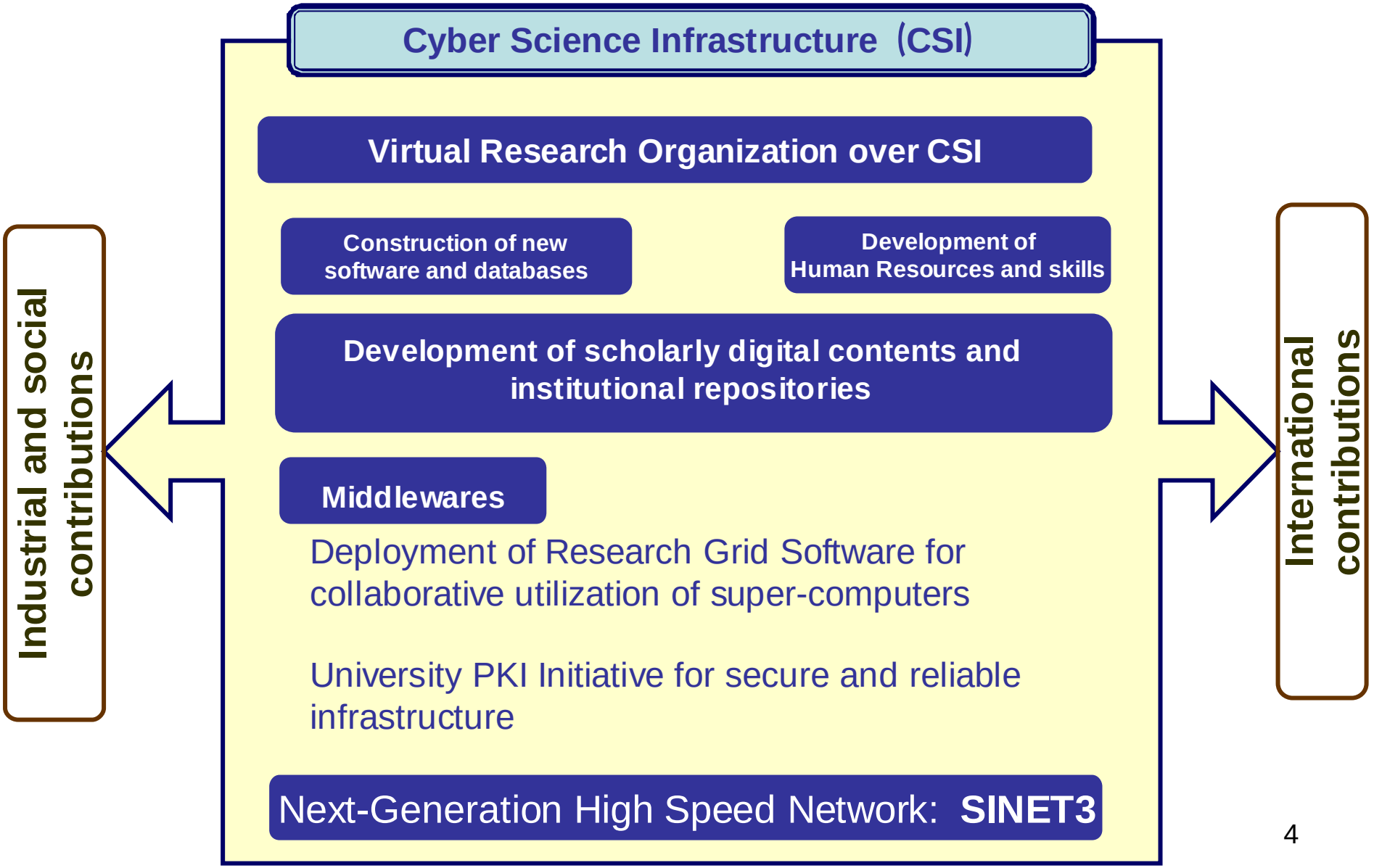
- ●固定価値の解明から変化過程の解明･制御へ

ロ研究方法論のパラダイムシフト

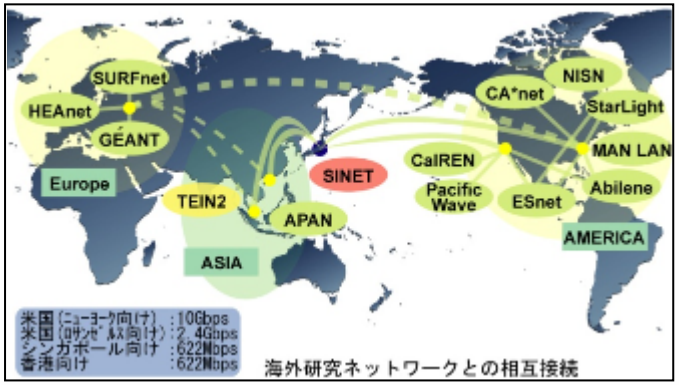
- ●実験サイエンス
- ●理論サイエンス
- ●計算サイエンス
- ●E-サイエンス

CSIが実現する学術連携の姿

Toward Cyber Science Infrastructure (CSI)



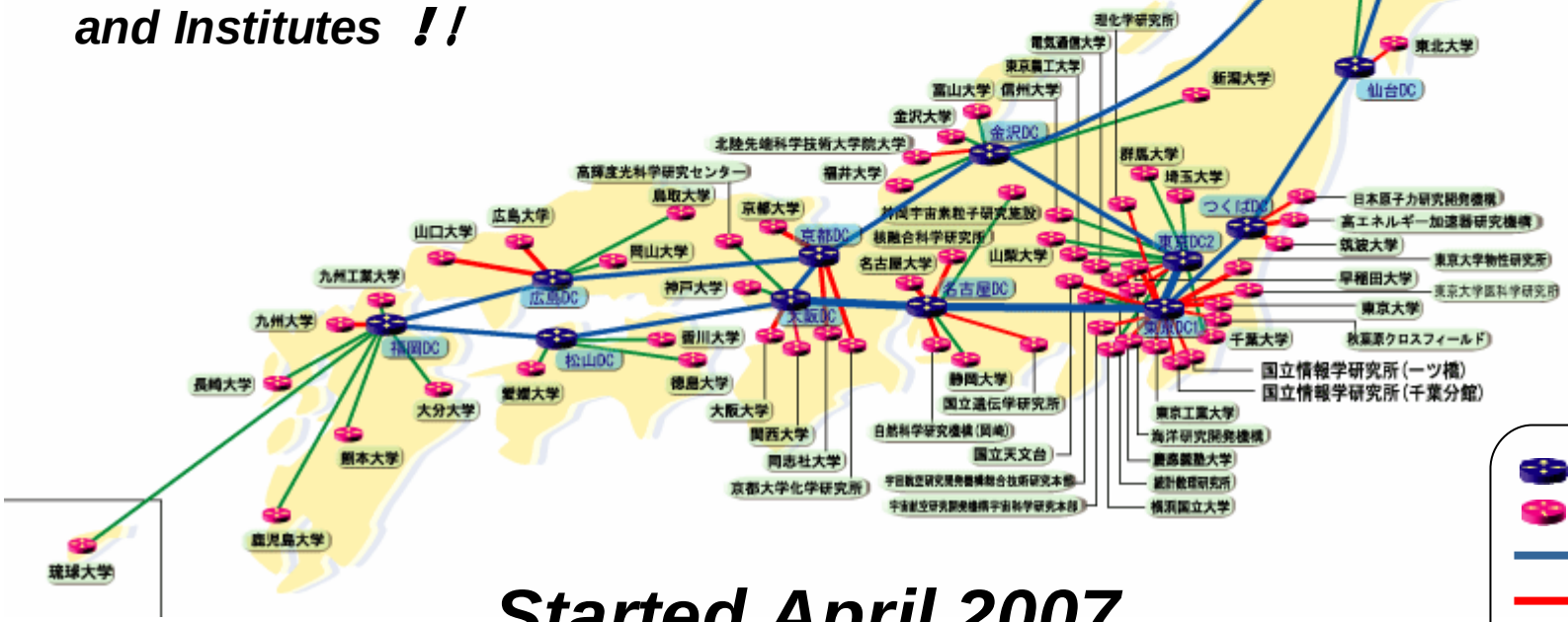
Next-generation Science Information Network SINET3



【Circuit Speed】

Relay node (12 nodes)	10～40Gbps	
Node (**SINET**/Super **SINETnode**、62Nodes)	1Gbps～10Gbps	
International Line	USA	10Gbps×1 2.4Gbps×1
	Singapole	622Mbps
	Hong kong	622Mbps

Providing more than 700 Universities and Institutes ！！



【凡例】

- Relay Node
- Node
- More than10Gbps
- 2.4Gbps, 10Gbps
- 1Gbps

Started April 2007

SINET3の新サービス　～マルチVPN等の実例

- SINET3は、L1-VPN,L2-VPN,L3-VPN, 全てを一つの回線で提供できる革新的プラットフォーム
  - L2-VPN(VPLS:virtual private LAN service)　地震研で利用。
  - L3-VPN: 核融合科学研究所　核融合研究バーチャルラボラトリで利用。
  - L1-VPN：国立天文台の光結合ＶＬＢＩ(eVLBI) 観測網、Ｌ1オンデマンドとあわせて利用

◆東京大学地震研究所による次世代全国地震データ流通基盤システムの構築。
◆インターネットから隔離した安全･安心なクローズド･ネットワークを全国規模で実現。

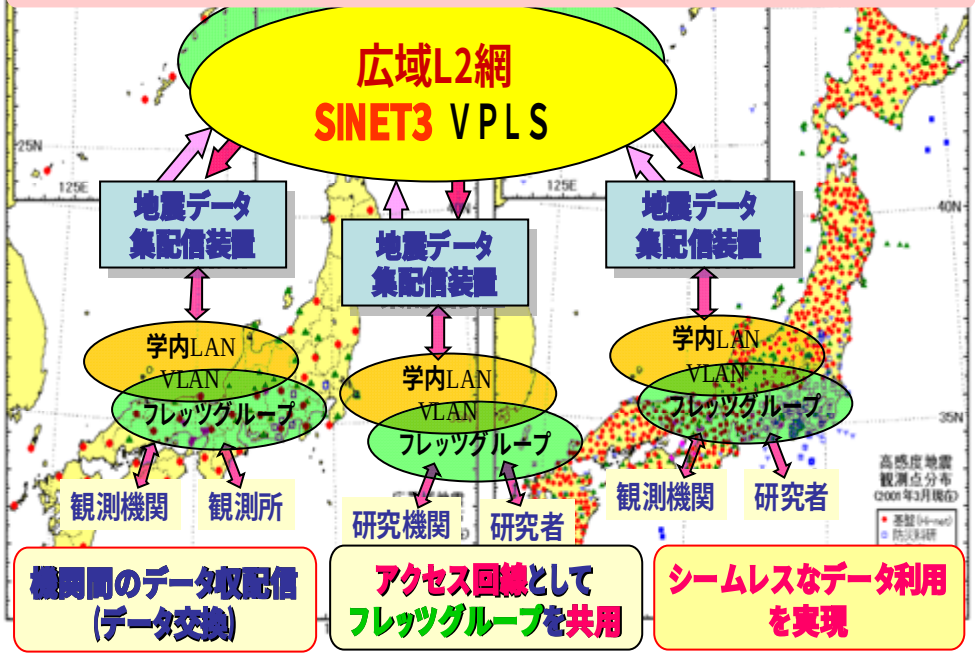
◆核融合科学研究所バーチャルラボラトリにおけるＬＨＤ遠隔実験などを、セキュリティの高いネットワーク環境で実現。
◆国立天文台の光結合ＶＬＢＩ(eVLBI) 観測網を、Ｌ1－ＶＰＮとＬ1オンデマンドで観測時に専用線環境を研究拠点間で利用

JDXnet

全国の観測機関との共同事業

次世代全国地震データ流通基盤システムの構築

全国の地震波形データが全国どこでもリアルタイムで利用可能



核融合科学研究所バーチャルラボラトリ
Ｌ3－ＶＰＮ接続を利用

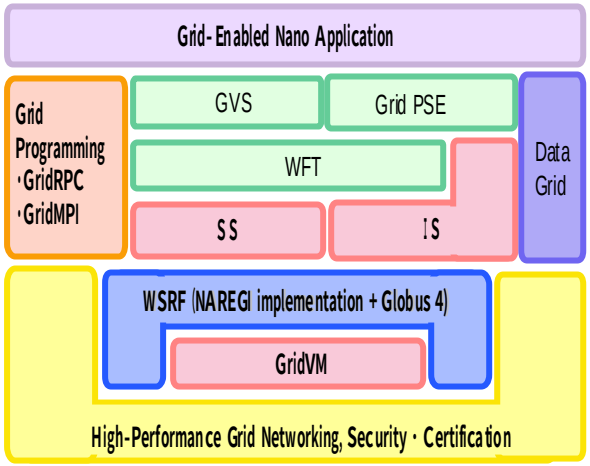
国立天文台の光結合ＶＬＢＩ(eVLBI) 観測網
Ｌ1－ＶＰＮ接続し、オンデマンドで専用線帯域確保

Science Grid NAREGI

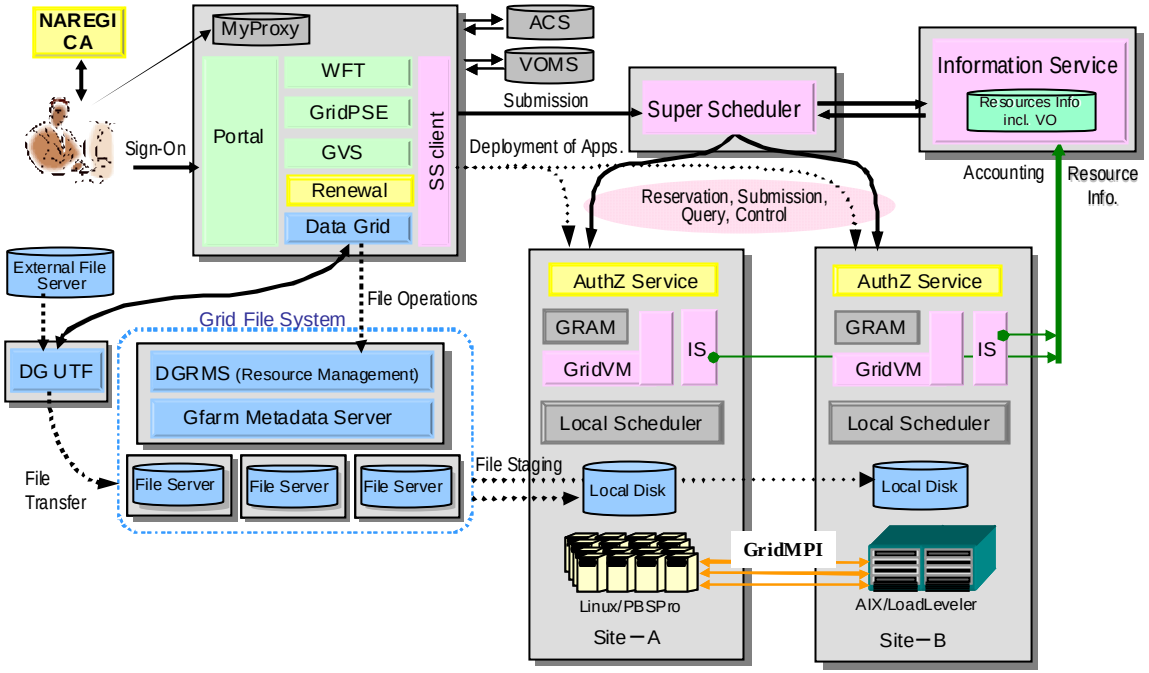
- Middleware Version. 1.0 Architecture -

NAREGI middleware consists of security services, portal, client tools, programming libraries, resource and job management services, grid file system, management tools etc. Users can describe their process workflows as workflow jobs with GUI based Work Flow Tool (WFT) and submit them to NAREGI resource and job management services. To make job submission, execution and data handling secure, NAREGI middleware uses GSI based security architecture.

NAREGI middleware supports heterogeneous computing environments (CPUs, OSs, batch schedulers), automatic resource brokering, advanced reservation based co-allocation, sharing resources with local submitted batch jobs (non grid batch job), using grid standards, etc. NAREGI also support Virtual Organization (VO). Real organizations which use NAREGI can create a VO together, and share computing/storage resources and applications among organizations.



NAREGI Software Stack

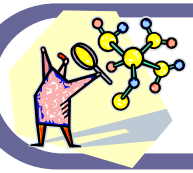


Scholarly Digital Contents and NII

Aiming at:

Stable dissemination, preservation, and provision of information produced by academic communities.

Precise and timely service of information that academic communities require.



Academic communities

(researchers , universities, academic societies, etc.)

supporting

Cyber Science Infrastructure: CSI

Networking + Digital contents + Research Activities

Scholarly digital contents are common properties among universities and NII

NII-ELS

- E-journals of Japanese academic societies and university bulletins
- Retrospective digitization as e-archive
- 3,300 titles, including 3 million articles

NII-REO

- Archive server for university library consortium
- “last resort” of scholarly e-journals
- 1,800 titles, including 3.4 million articles, such as Springer and OUP

NII

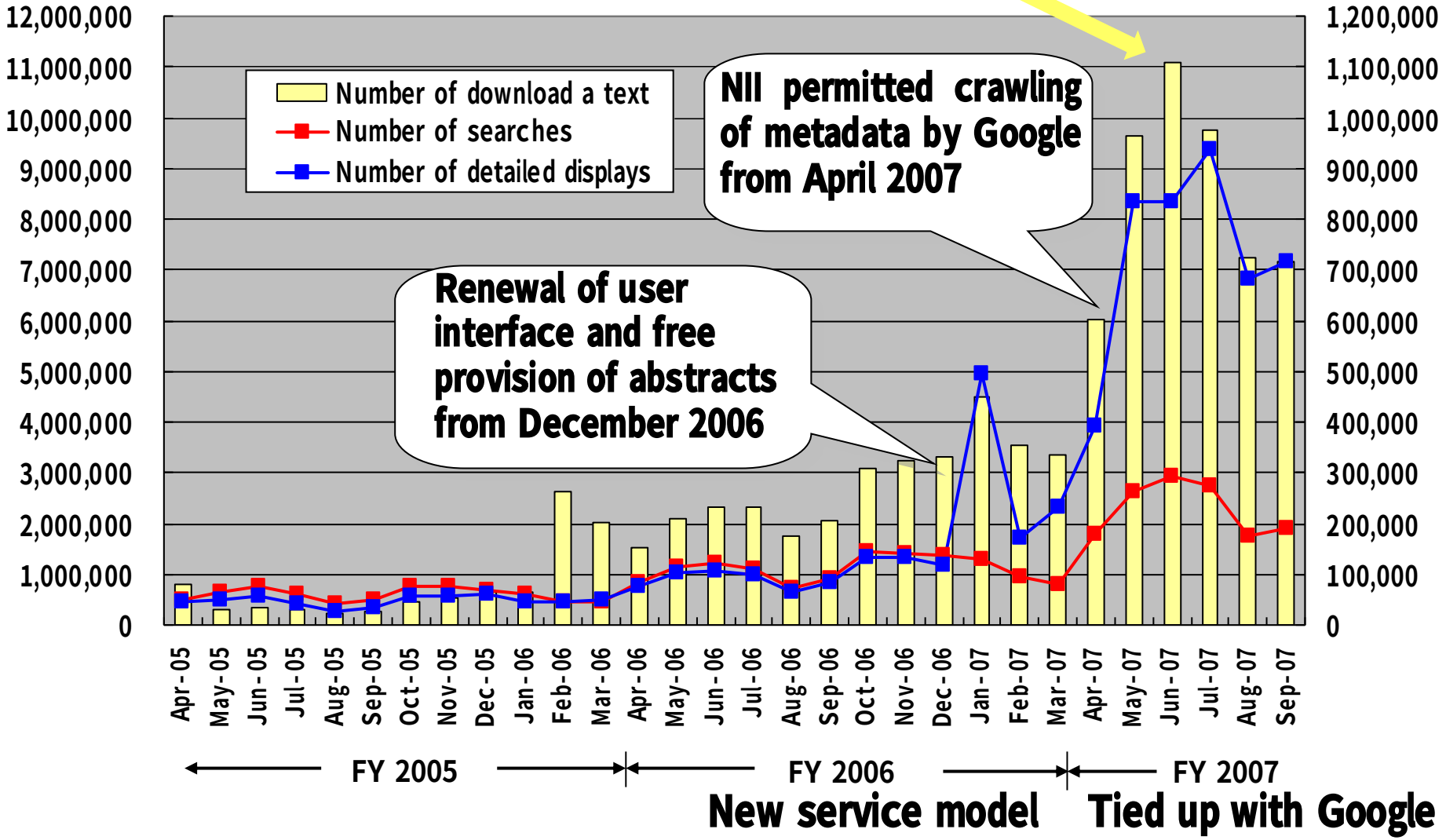
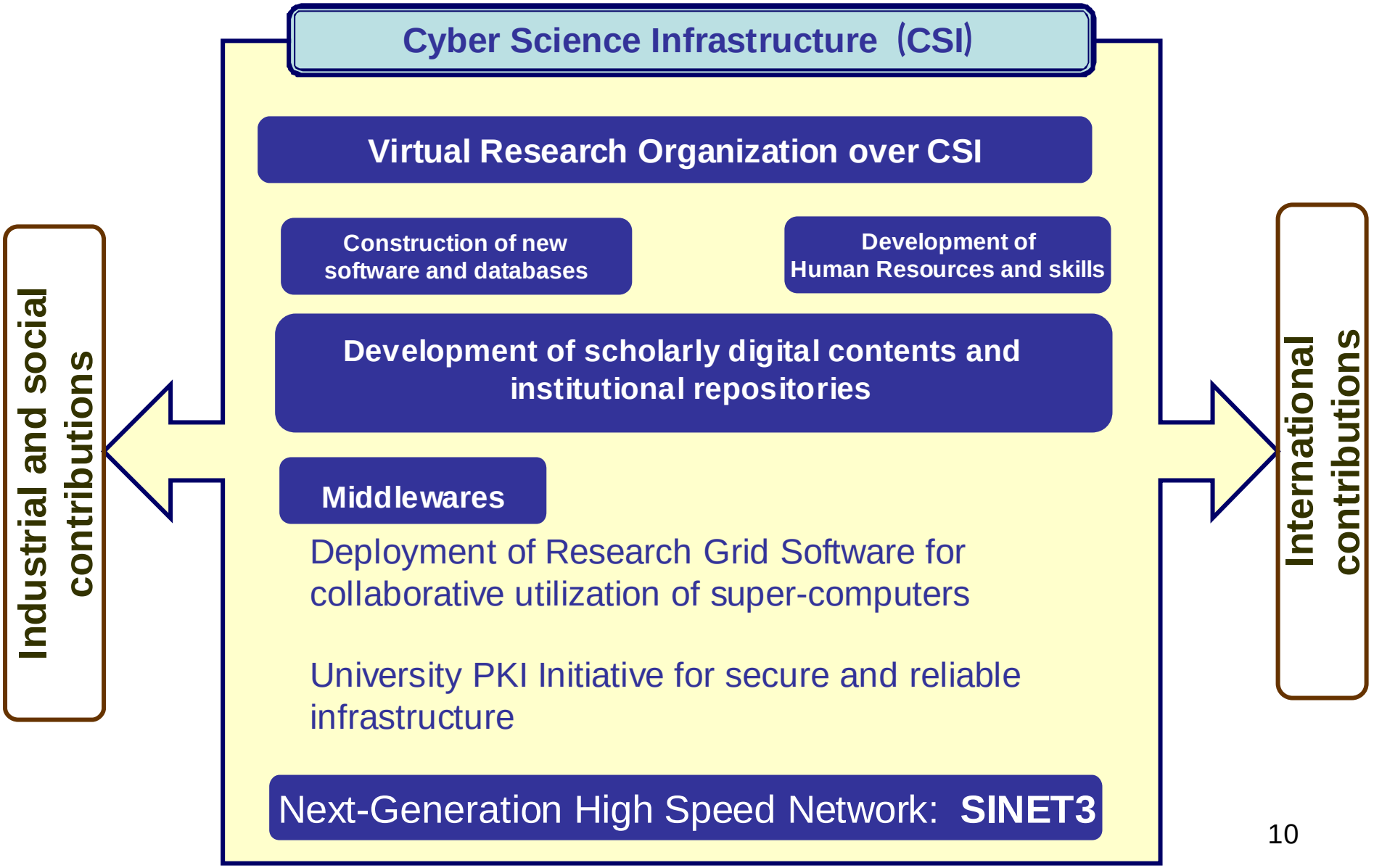
Institutional Repositories

- Dissemination of university information and research results
- Linkage with REO and ELS
- Linkage to open access journals and green journals

NII + Universities

Growth of Usage of CiNii/ELS: Japanese E-journals

Over 15 million downloads of PDF files expected in FY2007



Toward Cyber Science Infrastructure (CSI)