

Asia Construction Information Technology Round Table Meeting
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Activities in the Sub-Committee on Cyber and Real Infrastructure Model in the Committee on Civil Engineering Information Processing, Japan Society of Civil Engineers (JSCE)

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Chair of the Sub-Committee on International Affairs

Vice Chair of the Special Sub-Committee on Systematization of Civil Engineering Informatics
Member of the Sub-Committee on Journal of Civil Engineering Information Processing
Permanent Member of the Committee on Civil Engineering Information Processing, JSCE

1. JSCE

- Japan Society of Civil Engineers (JSCE) was established as an incorporated association in 1914 entrusted with the mission to contribute to the advancement of scientific culture by promoting the field of civil engineering and the expansion of civil engineering activities.
- Since its establishment, JSCE has endeavored to achieve the above mission, through extensive activities including scientific exchange among members, researchers / promotion of science and technologies relating to the field of civil engineering, social involvement, etc.
- Over the years, the JSCE membership has increased significantly from the initial 443 members to approximately 39,000 members at present, and is currently engaged in various wide-ranged activities around the world.

Organization of JSCE

- BOD
- 8 Regional Branches and 1 Overseas Branch (9 sub branches: Taiwan, Korea, UK, Mongolia, Turkey, Indonesia, Thailand, Philippine, Vietnam)
- Civil Engineering Library
- Steering Council (12 Divisions, including the Division of Research and Development)
- Division of R&D has 29 Committees in the 7 main civil engineering fields.

2. Seven Main CE Fields in JSCE

1. Structural Engineering
2. Hydraulics and Hydrology
3. Soil Mechanics and Geotechnical Engineering
4. Transportation and Urban Planning
5. Concrete and Materials
6. Construction Engineering Management
7. Environment and Energy Engineering

3. Field of Construction Engineering Management

- 7 Committees

1. Civil Engineering Information Systems

2. Construction Technology Research

3. Construction Robotics

4. Construction Management

5. Consultants

6. Safety Problems

7. Underground Space Research

4. Committee on Civil Engineering Information Processing

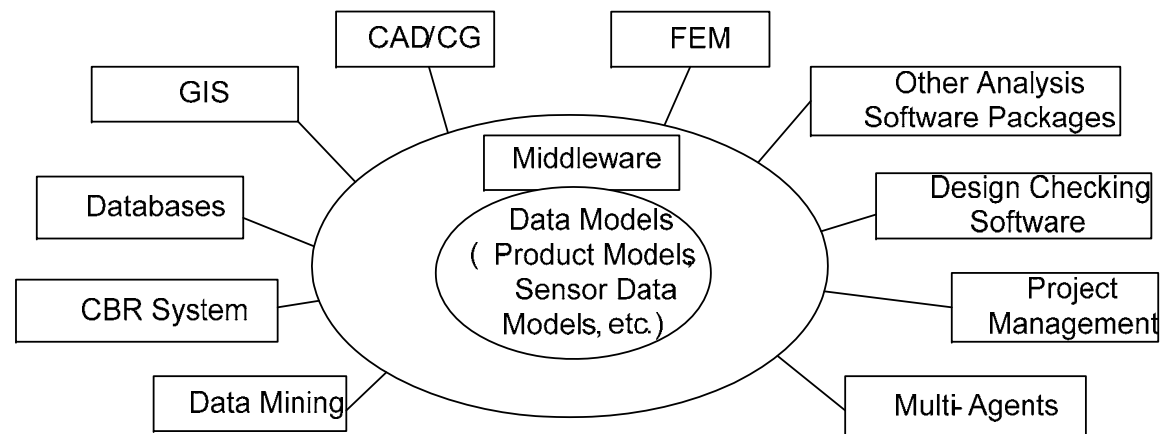
- Chair, 5 Vice Chairs, 14 Advisors, 1 Secretary-General, 42 Permanent Members
- Administrative Group
- Three Administrative Sub-Committees
 - Event Planning
 - Journal of Civil Engineering Information Processing
 - International Affairs
- Six Technical Sub-Committees
 - Electronic Standards Planning
 - Construction Information Model
 - Information Sharing Technology
 - Cyber and Real Infrastructure Model
 - Sensor Utilization Technology
 - Systematization of Civil Engineering Informatics (Special Sub-Committee)

5. Sub-Committee on Cyber and Real Infrastructure Model

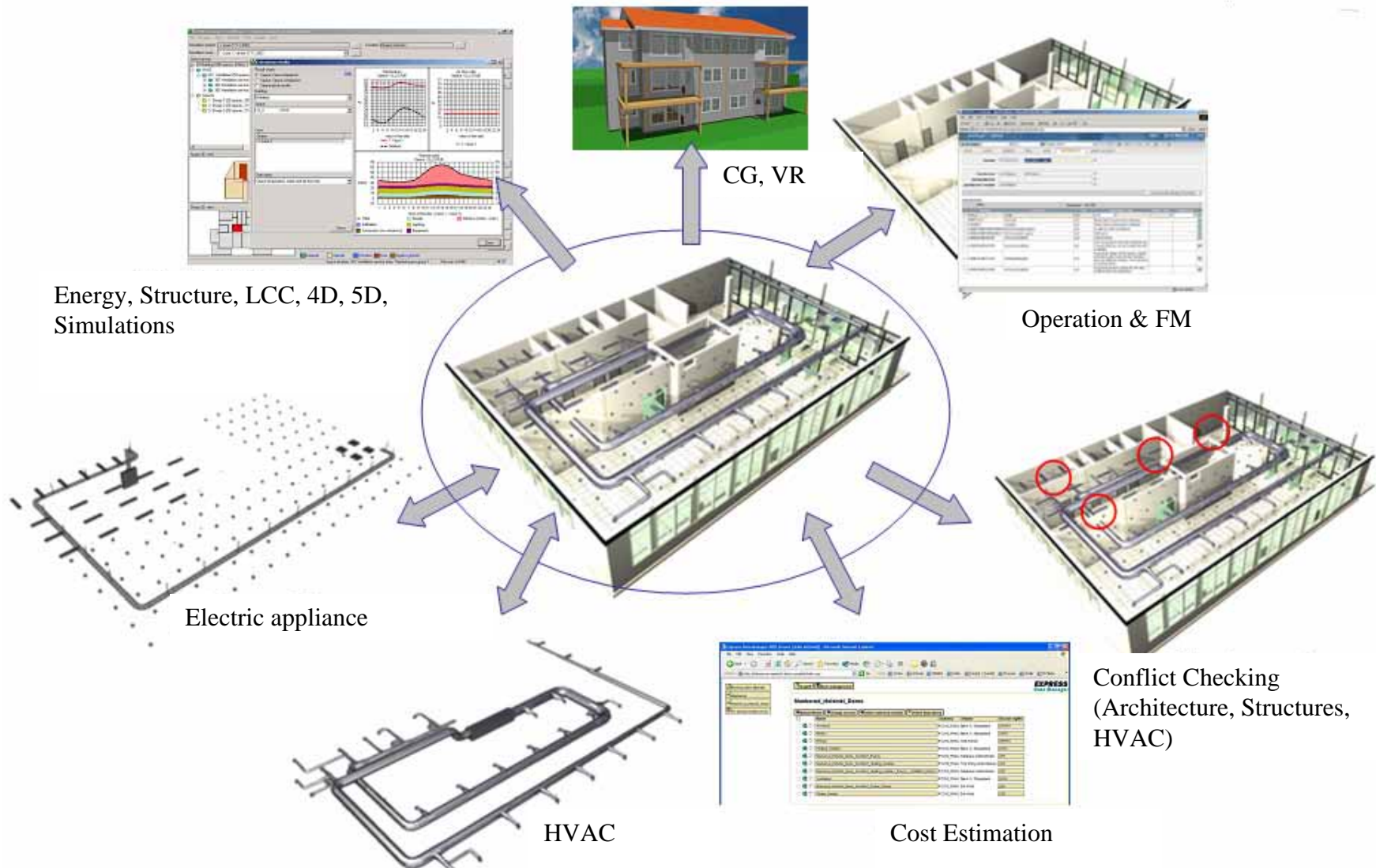
- Started from July 2006.
- 1st term: July 2006 to June 2008
 - Chair: N. Yabuki, Vice Chair: S. Murai, 9 members
- 2nd term: July 2008 to June 2010
 - Chair: N. Yabuki, Vice Chair: S. Murai, 20 members
- 3rd term: July 2010 to June 2012
 - Chair: S. Murai, Vice Chairs: Y. Fujisawa, M. Joko, 17 members.
- Bi-monthly meetings.

Objectives

- Building Information Modeling (BIM) has been a buzz word in IT in civil and building engineering.
- BIM can integrate various application systems and provide interactive VR and technical simulation visualization capabilities. (Go to next slide and Return.)
- Cyber World
- Cyber World will become an information and communication **infrastructure** for users and stakeholders to get support from it as well as to provide their information to it.



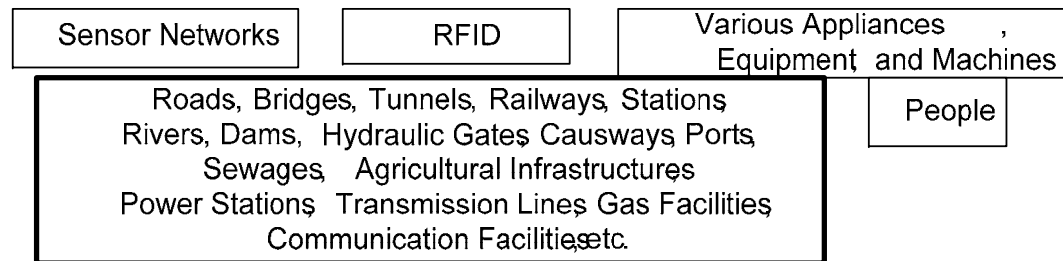
BIM (Building Information Modeling)



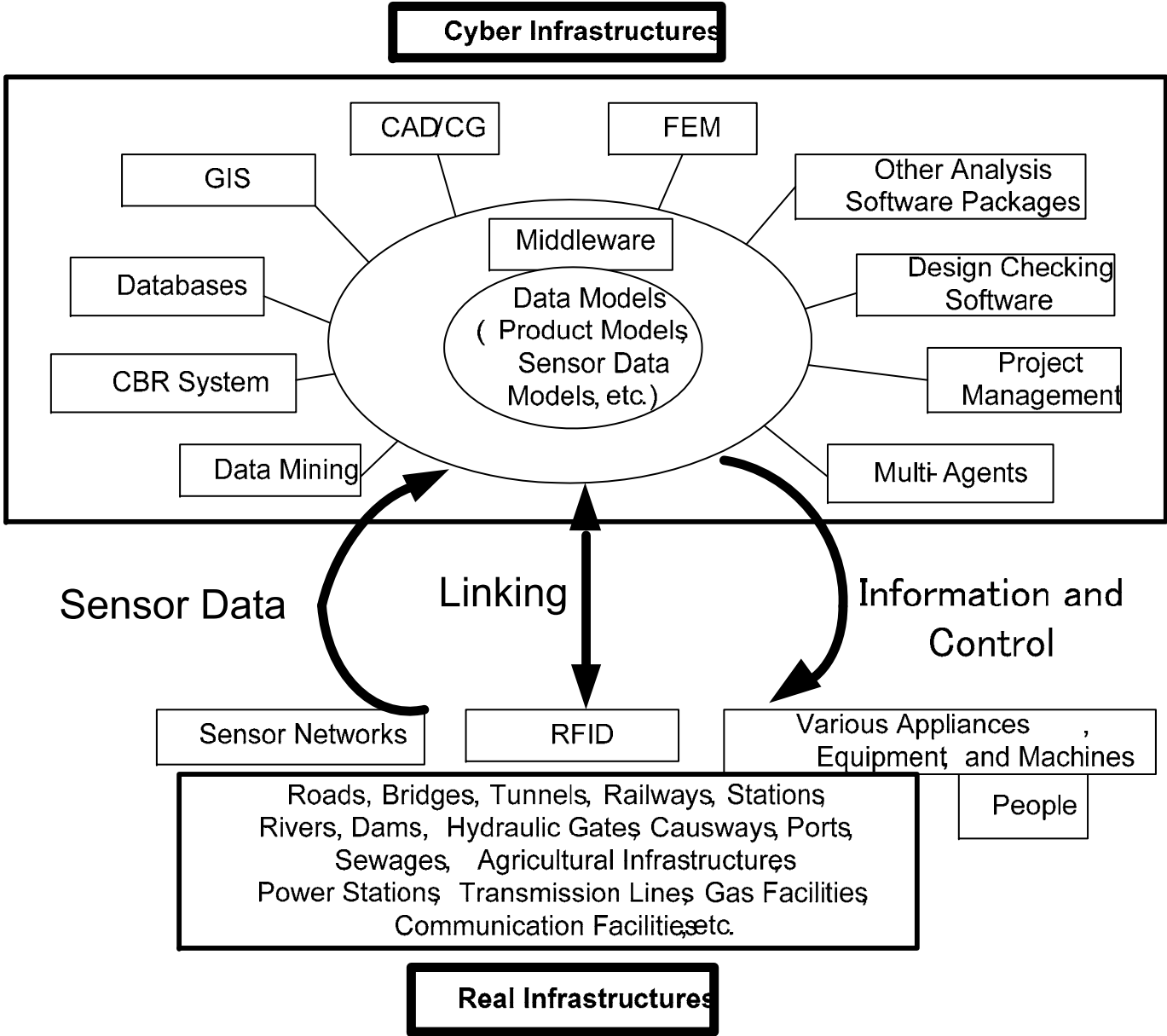
Source : IAI, AEC3 (TLC)

Real Infrastructure

- At the same time, we have to realize that civil infrastructures are actual things in the Real World.
- Thus, linking, integrating, and fusing Cyber and Real infrastructures is essential.
- RFID and wireless sensor networks are prospective technologies for linking these two infrastructures.
- Further, if Cyber Infrastructure can provide people and various equipment in Real Infrastructure with information, guide, and support, it will enable us to develop safe and secure societies and better quality of life.
- **Integration of Cyber and Real Infrastructures** will help us to *create new VALUES.*



Integrated Real and Cyber Infrastructures



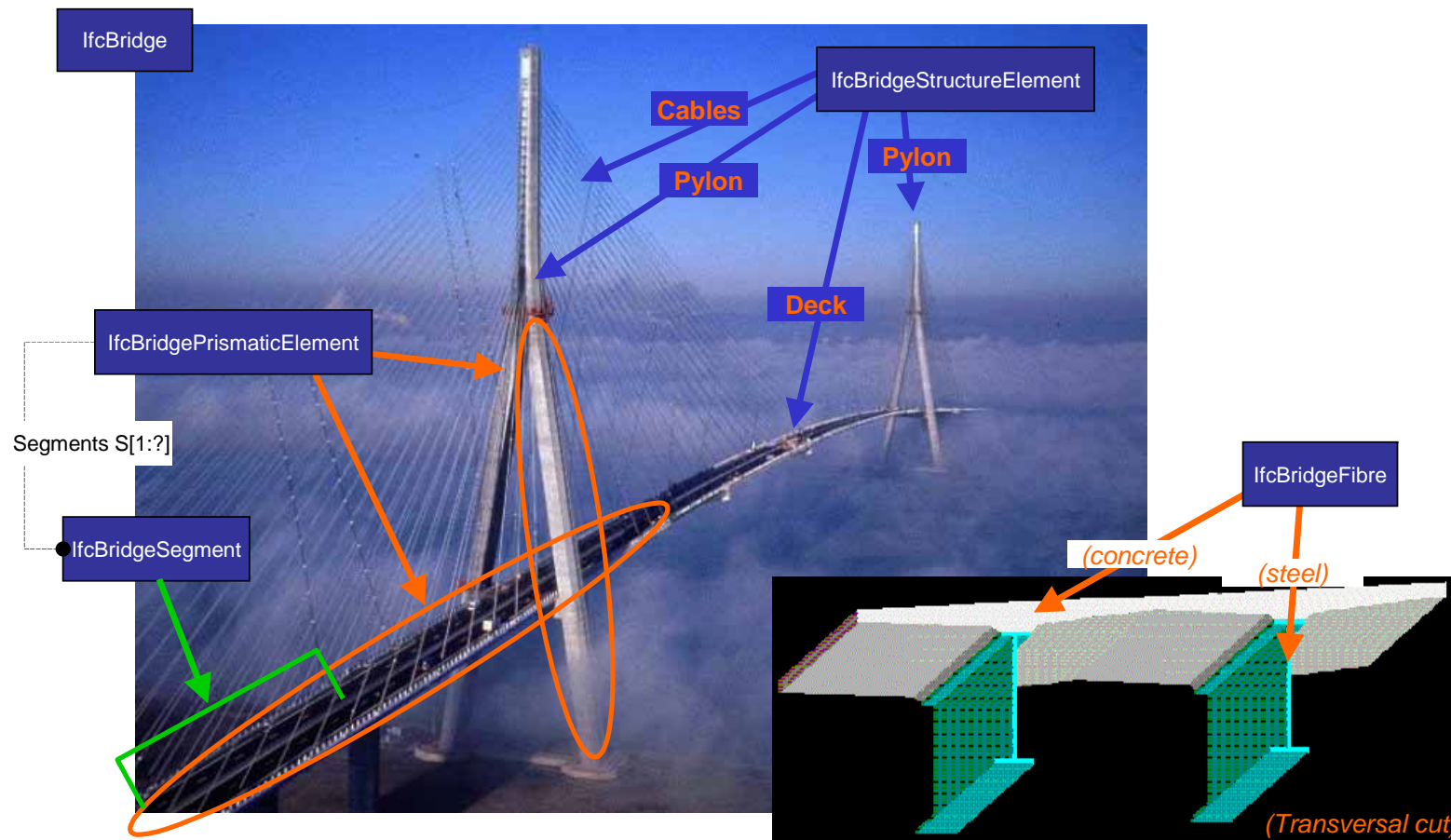
Three Working Groups

- 3D Model WG
- Sensor Network and RFID WG
- Simulation and Information Transmission WG

3D Model WG

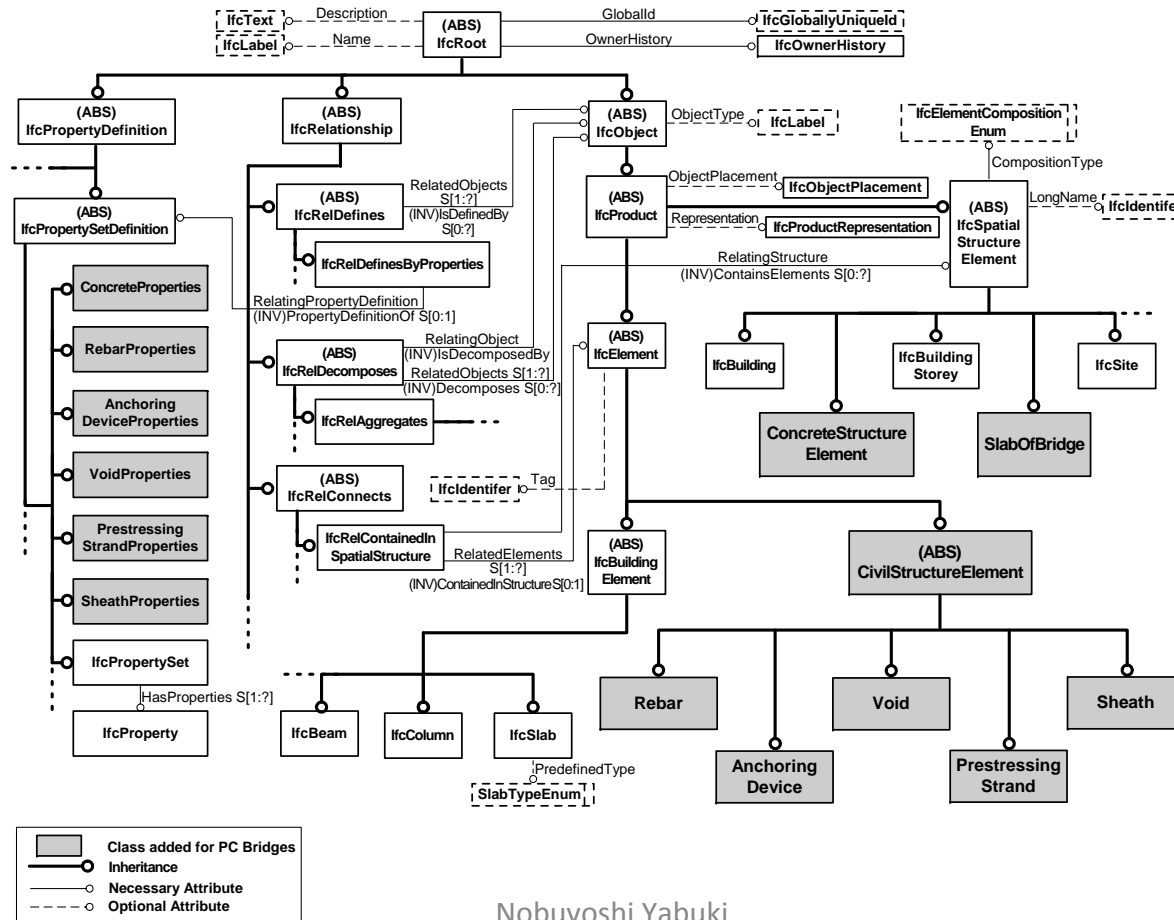
- Development and promotion of IFC-Bridge in collaboration with IAI Japan and CSTB of France
- Development and promotion of IFC-ShieldTunnel in collaboration with JACIC, JSCE Committee on Tunnel Engineering, IAI Japan.
- Research on 4D and 5D models in collaboration with Teesside University, UK.
- Research on VR in collaboration with CSTB, France.
- Survey of actual usage of 3D models in design, construction, or maintenance.

IAI French Speaking Chapter (SETRA, CSTB, etc.) translated OA_EXPRESS into IFC and opened it as IFC-BRIDGE in 2002.

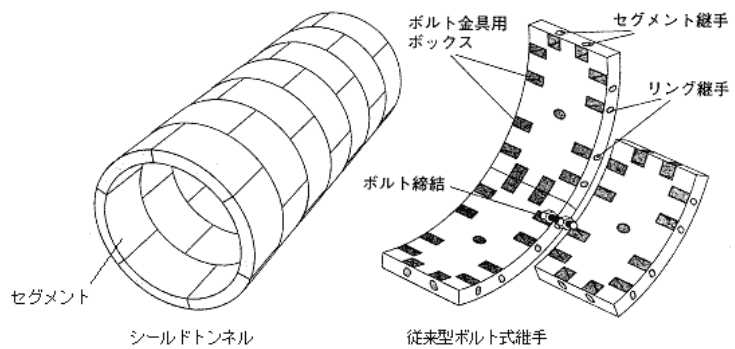
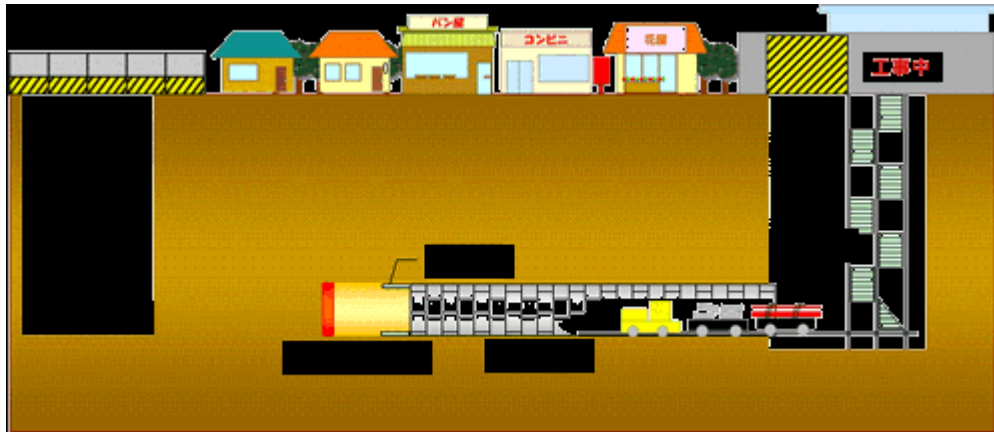


YLPC-BRIDGE Product Model

- Yabuki et al. developed a product model for prestressed concrete bridges by expanding IFC2x with Japan Prestressed Concrete Contractors Association in 2002.

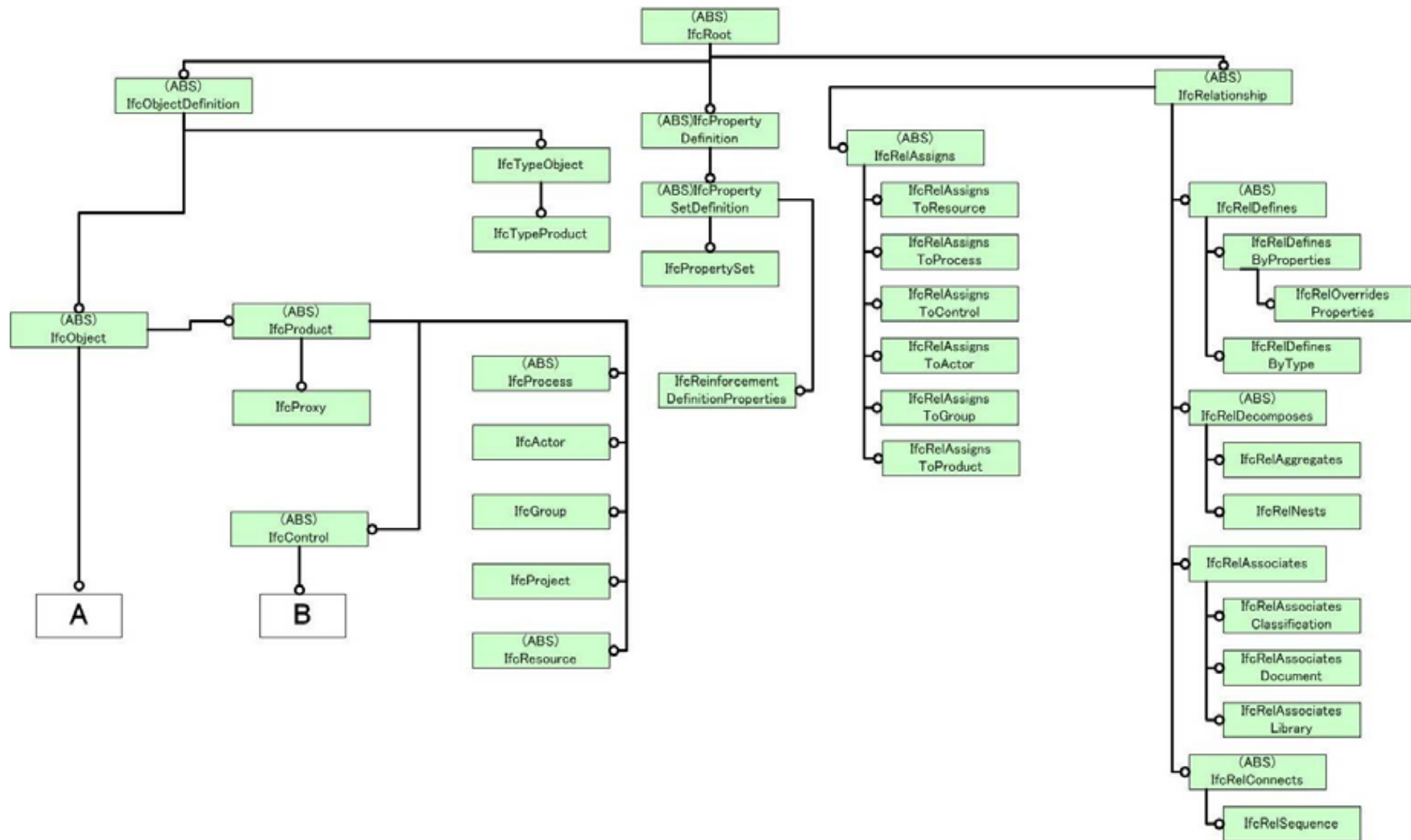


SHIELD TUNNELS

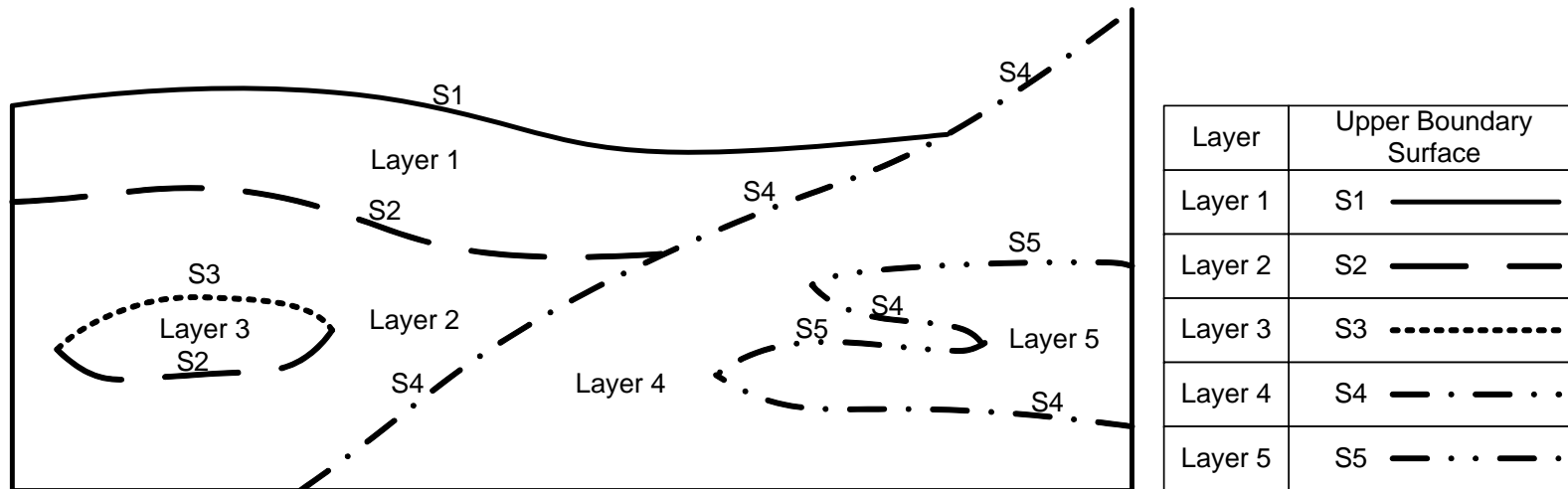


出典先：【図解】東京の地下技術 東京都福祉部 青山 侑
 東京都駐車場公社 理事長 前東京都建設局長 古川公毅 【編】
 株式会社 かんき出版





Upper Boundary Surface Method for representation of soil layers



each soil upper boundary surface is defined with its lower soil layer's name and any point in any soil layer can be classified by looking up the immediate upper boundary surface's soil layer name

Sensor Network and RFID WG

- Survey of actual usage of sensors and RFID tags in design, construction, or maintenance.

Simulation and Information Transmission WG

- Survey of various simulation software packages.
- Research on Building Information Modeling (BIM).
- Survey of actual usage of advanced simulation technologies and information transmission in civil engineering.

2008 Symposium on Civil Engineering Information Processing

- Our sub-committee planned, organized and executed a special plenary session in the symposium on November 7, 2008 in collaboration with the sub-committee on event planning.
- Theme: Environment and Energy Issues and Cyber & Real Infrastructure Modeling
- Special Guest Keynote Lecture: “Ubiquitous Society”, Prof. Ken Sakamura, the University of Tokyo
- Special seminars: “Information-Driven Construction”, “Environmental Design”, and “BIM and Environmental Simulation”

Current and Future Activities

- Bi-monthly meetings and WG meetings
- Seminars and talks by guest speakers and committee members on Cyber and Real Infrastructure Models.
- Integration of Design and Construction is a challenging problem.
- Scenario planning
- Benefit and Cost Comparison
- Discussion
- Holding seminars

Thank you for your attention.