第21部

インターネットを用いた高等教育環境

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第 1 章 Introduction

1.1　AI3

AI3 (Asian Internet Interconnection Initiatives/read: ei-triple-ai) Project is an international research project established between research institutions in Asia in 1995 supported by WIDE Project and JSAT Corporation (currently, SKY Perfect JSAT Corporation). AI3 started its test-bed network operation in October 1996 with the establishment of the NAIST-ITB KU-band link and then launched the C-Band based testbed from 2001. This project aims to provide satellite internet link infrastructure and technology to the Southeast Asian region, with Keio University and Nara Institute of Technology (NAIST) serve as the hubs. AI3 Project developed an advanced international internet backbone with the

cooperation between partner universities that is not dependent on the state of terrestrial infrastructure development by utilizing a satellite communication technology that covers the whole Asian region. As a founding partner, Keio University Shonan Fujisawa Campus (SFC), with its satellite antenna located inside the campus, has played a central role since the inception of the project until now.

1.2　SOI Asia

SOI Asia (School on Internet Asia/read: soi-asia) Project is an international education consortium established in 2001 by WIDE Project with the objective of achieving education collaborations between Southeast Asian universities on the internet utilizing the infrastructure technology, developed by AI3 Project. Asia SEED (a non-profit organization) supported SOI Asia to start the educational collaboration with top-level

Universities in the Southeast Asian region at the first phase of the project. SOI Asia has implemented human resource development programs in Asia in various fields, including information technology, security, marine technologies, environmental issues, cultural understandings, disaster management, and entrepreneurship. These programs are conducted with the spirit of cooperation and mutual respect. This consortium has grown into a strong community, where it does not only share university courses but also establishes infrastructure to support university-based entrepreneurship and helps each other at the time of disasters. And from 2008, with cooperation with UNESCO, SOI Asia also contributes to the development of the next generation of global human resources, especially in science and technology.

1.3　Project Achievements

AI3 developed and deployed a unidirectional link (UDL) on the network testbed, contributed to the standardization of the UDLR technology. AI3 was running IPv6 and multicast on this UDL that contributed to connecting wider area in Asia. The collaborative research activities of AI3 along with the IT HRD programs of SOI Asia have played a major role in the development of satellite internet infrastructure in the Southeast Asian region. Through both projects, participating countries in the region have acquired the advanced technology and operation know-how of the internet. The partner organizations, as well as the researchers, have led the internet infrastructure in their respective countries, resulting in the development of the internet infrastructure as we have now witnessed in the region. In fact, from this community, we have three founding members who are recognized as inductees in the Internet Hall of Fame.

第 2 章 The 50th Meeting

Official Web: `https://50th-ai3-soi.com/`

AI3 and SOI Asia have been jointly conducting meetings once to three times per year. The meeting held at Keio University now marks the 50th meeting of this community, starting with the first meeting conducted in Singapore in 1996 (See

Appendix A).

On October 22 (Tue) to 24 (Thu), the 50th meeting was held at Keio University.

Around 70 participants from 11 countries, including students, alumni, researchers, professors, staff members, engineers, the leadership from various partner universities from across Asia, as well as supporters and collaborators from industry and government in Japan joined this meeting not only to commemorate this occasion but also to discuss the future development of the internet and university education in Asia (See Appendix B).

We report the program and session summaries in the following section.

October 22, 2019　13:00-17:00

Welcome Remark
 Keiko Okawa (Keio University, Japan)

Panel: IT Human Resource Development and IT-Mediated Education
Moderator: Achmad Husni Thamrin (Director, AI3 Project / Keio University)
Panelists:
- Hossen Asiful Mustafa (Bangladesh University of Engineering and Technology (BUET), Bangladesh)
- Alwin Melkie Sambul (Universitas Sam Ratulangi (UNSRAT), Indonesia)
- Arry Akhmad Arman (Director of IT Center, Institut Teknologi Bandung (ITB), Indonesia)
- Yuji Sekiya (Curriculum Director, Advanced IT Architect Human Resource Development Council (AITAC) / University of Tokyo, Japan)

Discussions:
Arry/ITB argued that IT-mediated education initiatives have to push for more formal and massive implementations while there should be a forum to share IT problems and solutions among

universities.

Alwin/UNSRAT outlined a university-wide initiative based on rector's decree to introduce blended learning with 25% of classes will be online and the main challenge is the adoption of e-learning among senior faculty members.

Sekiya/AITAC introduced their curriculum and the plan to prepare the English version of the training.

Cancio/UNTL outlined the situation and challenges of IT-mediated learning in Timor-Leste.

Hossen/BUET introduced the situation in engineering education in BUET.

Operator's task force meeting-Discussion about future infrastructure

Chair: Achmad Husni Thamrin (Director, AI3 Project / Keio University)

This meeting discussed the C-band network situations, including challenges in equipment procurement in several countries and possible interference with 5G operations in Japan. As for the future plannings, research such as in IoT and disaster response, as well as the deployment of M-Root anycast servers in RENs in partner countries were also included in the discussions.

SOI Asia Academic Meeting-Future program collaboration

Chair: Keiko Okawa (Keio University, Japan)

This meeting was conducted in a workshop style. 5 teams with 5-6 members discussed our possible activities in collaboration in education. The following ideas were shared among the community:

- Research collaboration on online education, smart cities, smart house for Aging Society,
- Promote an open science community and platform.
- Platform to share the experience of IT and competency education among universities.
- Joint development of micro-credential courses for partner universities in emerging areas such as cybersecurity, energy, IoT.
- Fieldwork and Internship program development (enhance EBA-Evidence Based Approach program activity).
- Develop a common curriculum and certificate program

for ICT engineer training utilizing existing resources and several communication technologies with the collaboration of AITAC and APNIC.

We will start a discussion to proceed with some of the ideas.

Research Presentations

Chair: Goki Miyakita (Keio University, Japan)

Presenters:

· Md. Amirul Islam (Institute of Information and Communication Technology (IICT), Bangladesh University of Engineering and Technology (BUET))

- Research title: A Dynamic Reallocation Based Window Access Scheme for Enhancing QoS of Vehicular Ad-hoc Networks (VANETs)

· Raden Arief Setyawan (Universitas Brawijaya (UB))

- Research title: WSN Based River Monitoring System

· Muhammad Niswar (Universitas Hasanuddin (UNHAS))

- Research title: CrabWatch: IoT and AI-enabled Smart Crab Farming System

· Sheena Yngre Liman (Keio University)

- Research title:SDGs Education Program for High Schools in Indonesia and Japan, as Comparative Study in Designing A Workshop for Users from Different Background

· Yuka Shori Kataoka (Keio University)

- Research title: Quantitative Oral Corrective Feedback for Scalable Japanese Language

October 23, 2019 9:00-17:30

Opening Ceremony

MC: Marcos Maekawa Sadao (Keio University, Japan)

Greetings from Keio University

· Opening remarks from Keio University: Jun Murai, Project Chair

· Welcome speech: Akira Haseyama, President of Keio University

Invited talks from Japanese partners

- Minoru Okada (Professor of NAIST, on behalf of NAIST president)
- Mitsutoshi Akao (Executive Officer, SkyPerfecTV)
- Masahiro Hamano (Chairman of AsiaSEED)

Celebration of The Internet hall of fame 2019 – Suguru Yamaguchi

Keynote Panel: The Impact of Inter-University Collaboration towards Sustainable Society
Moderator: Keiko Okawa (Keio University)
Panelists:
- Ellen Joan Kumaat (Rector, Universitas Sam Ratulangi (UNSRAT), Indonesia)
- Hizir Sofyan (Vice-Rector, Universitas Syiah Kuala (UNSYIAH), Indonesia)
- Khin Thanda Soe (Pro-Rector, University of Computer Studies, Mandalay (UCSM), Myanmar)
- Seingheng Hul (Deputy Director, Institute of Technology of Cambodia (ITC), Cambodia)
- Laxman Poudel (Professor / Campus Chief, Institute of Engineering, Tribhuvan University (TU), Nepal)

Discussions:
Ellen/UNSRAT argued that collaborations bring about resource, values, and experience sharing as well as serve as gateways to global partnership.
Miming/ITB introduced the collaborations of ITB, mainly in the network-related themes.
Hizir/UNSYIAH introduced the focus of UNSYIAH in relation to SDGs and the national research center of excellence in the university, including the one for disaster mitigation.
Laxman/TU argued for more collaborations in engineering and energy related fields.
Hul/ITC and Khin/UCSM introduced the collaborations of each of their university in education and research, mainly in technology and computer science.

Panel: Internet Inclusion: Role of REN in Asia
Moderator: Jun Murai (Keio University)
Panelists:

- Kanchana Kanchanasut (Professor, Asian Institute of Technology (AIT), Thailand) [Internet Hall of Fame inductee]
- Bayani Benjamin Racadio Lara (Advanced Science and Technology Institute (ASTI), Department of Science and Technology(DOST), Philippines)
- Che-Hoo Cheng (Infrastructure & Development Director, Asia Pacific Network Information Centre (APNIC), Australia)
- Masafumi Oe (Vice director of IT Security Office, National Astronomical Observatory of Japan (NAOJ), Japan)

Discussions:
Kanchana/AIT outlined the research conducted by her team in rural areas connectivity as well as connectivity in the disaster-stricken areas.
Bayani/ASTI introduced the experience of PREGINET, the NREN of Philippines, including the development of various network-based applications on PREGINET.
Cheng/APNIC introduced the internet development work by APNIC and conveyed an expectation for RENs to lead in testing and deployment of advanced internet technologies.
Oe/NAOJ introduced the network infrastructure and services in NAOJ to serve high volume traffic for astronomy-related applications.

Panel: Educational and Research Collaboration in Asia
Moderator: Achmad Husni Thamrin (Keio University)
Panelists:
- Ai Sugiura (Programme Specialist, UNESCO Jakarta Office)
- Tat Chee Wan (Associate Professor, Universiti Sains Malaysia (USM), Malaysia)
- Muhammad Niswar (Director of ICT Center, Universitas Hasanuddin (UNHAS), Indonesia)
- Achmad Basuki (Director of Information and Communication Unit, Universitas Brawijaya (UB), Indonesia / Co-Director, idREN)

Discussions:
Ai/UNESCO introduced initiatives in open science and proposed masterclasses on sustainability science for

engineering innovation, science communications, and disaster communications.

T.C./USM showcased the experience of USM and introduced Asia-Pacific University-Community Engagement Network (APUCEN), which aims to create impactful engagement for global issues.

Abazh/UB and Niswar/UNHAS introduced collaboration initiatives in their universities, including the current status of Indonesian NREN, idREN.

Panel: Collaboration in Asia for the Internet Operation

Moderator: Jun Murai (Professor, Keio University, WIDE Project, Japan)

Panelists:

· Hirofumi Hotta (Director, Japan Registry Services (JPRS), Japan)

· Kazuhiro Kitamura (Manager, Japan Registry Services (JPRS), Japan)

· Akira Kato (Professor, Keio University, WIDE Project, Japan)

· Che-Hoo Cheng (Infrastructure & Development Director, Asia Pacific Network Information Centre (APNIC), Australia)

Discussions:

Hotta and Kitamura/JPRS explained how Japan Registry Services (JPRS) provides services in domain registrations.

Kato/WIDE introduced M-Root servers and operations, as well as called for operators in Asia-Pacific regions.

Panel: Industry-government-academia collaboration

Moderator: Masaki Umejima (Keio University)

Panelists:

· Hiroki Takaya (Director, Ministry of Education, Culture, Sports, Science and Technology (MEXT), Japan)

· Shunichi Amemiya (Head of Research and Development Headquarters, NTT Data Corporation, Japan)

· Lena Ryuji (Philanthropies Manager, Microsoft Corporation, Japan)

· Rob Smith (Higher Education & eResearch Lead, Microsoft Asia Pacific) *remote participation

· Selvakumar Manickam (Associate Professor, Universiti Sains Malaysia (USM), Malaysia) *remote participation

Discussions:

Amemiya/NTT Data introduced the experience of NTT Data collaborating with SOI Asia in several topics, including smart city.

Ryuji/Microsoft Japan introduced Azure cloud solutions for education.

Tanaka/MEXT explained the support of the ministry for the collaboration.

October 24, 2019 9:00-13:00

Session: Internet Infrastructure Technology: Future Design from Asia

Moderator & Opening talk: Jun Murai (Professor, Keio University)

Speakers:

· "HAPS" – Ryuji Wakikawa (Vice President, Advanced Technology Division, Softbank Corp., Japan.)

· "Advanced Topics of Satellite Technology" – Kazuhiko Aoki (Executive Officer, Assistant Unit President, Space Business Unit, SKY Perfect JSAT Corporation, Japan)

· "Network Infrastructure for the Campus" - Takao Kondo (ITC, Keio University)

Discussions:

Wakikawa/SoftBank introduced a high-altitude platform service, which is in the development phase and expected to deliver 5G services in the future.

Aoki/SKY Perfect JSAT introduced some advanced topics in satellite technology, focusing on geostationary satellites.

Kondo/Keio introduced the infrastructure and applications in Keio to serve education applications.

Follow-up Discussions:

In this session, participants discussed further action items, including courses in marine science, collaborations in botnet research, M-root server, FIWARE, as well as the potential date and venue for the next meeting.

第 3 章 Dr. Suguru Yamaguchi Memorial Award

To commend talented researchers, developers and operators for next generations of AI3/SOI Asia Project, since 2017, we have been giving 'Dr. Suguru Yamaguchi Memorial Award' to two recipients per year (one recipient every meeting) with an extra prize.

This year, as a part of the 50th meeting on October 23rd, 2019, we had an awarding ceremony to Bayani Benjamin Racadio Lara of ASTI, Philippines. The ceremony was launched by a opening speech by Mr. Hisanobu Sato the board of director of AITAC, and awarded by Rui Yamaguchi, the son of the late Suguru Yamaguchi.

http://www.soi.asia/suguru_award/

Recipients of the Award (2017-2019)

2017 Spring

· **Achmad Husni Thamrin** (Project Assistant Professor, Graduate School of Media and Governance, Keio University) for his long term commitment to the AI3 and SOI Asia community and distinguished contribution to the leadership of AI3 Internet research and development.

2017 Autumn

· **Wan Tat Chee** (Associate Professor, School of Computer Sciences, Universiti Sains Malaysia) for his long term commitment to AI3 & SOI Asia community and distinguished contribution to the development of collaborations between Malaysia and Asian and European partners in the internet development.

2018 Spring

· **Basuki Suhardiman** (Wakil Direktur Sistem Teknologi dan Informasi, Institut Teknologi Bandung) for his long term commitment to AI3 and SOI Asia community and the distinguished leadership in the development of internet in Indonesia.

2019

· **Bayani Benjamin Racadio Lara** (Advanced Science and Technology Institute (ASTI), Department of Science and Technology (DOST), Philippines) for his long term commitment to AI3 and SOI Asia community and the distinguished contributions to the internet development in the Philippines.

第 4 章 Future Plans

As we discussed in the 50th meeting, we are going to continue to work together with SOI Asia / AI3 partners in Internet development, deployment and education in the Asian region. The following specific areas were identified:

- Future strategic design and development of the Internet in the Asia-Pacific region jointly working with APNIC and APNIC foundation.
- Joint course development for IT human resources including possible collaborations with APNIC and AITAC
- Joint course development for EBA (Evidence Based Approach), including the fieldwork design in Asian region.
- Joint effort for Timor-Leste internet infrastructure development for UNTL, together with UNESCO team.
- M-Root anycast server deployment in RENs, possibly with assistance from JPRS Inc., Japan and APNIC.
- Non-terrestrial infrastructure for the AP region including survey of C-band equipment procurement situation in partner countries.
- Research collaborations in two major areas from the region; IoT and disaster mitigation, management and recovery.

In 2020, AI3 & SOI Asia is planning the bi-annual meetings in Nepal hosted by Tribhuvan University (Kathmandu) and Australia hosted by APNIC (Brisbane). In the upcoming meetings, we will actively work on the possible collaboration with APNIC in research and education among the Asia & Pacific the region as we discussed in the 50th meeting.

In 2021, AI3 will celebrate its 25th and SOI Asia 20th

anniversary. Towards the future, we have started the discussion about new challenges in the NTN (Non Terrestrial Network) and explore the possible contribution to wider network communities such as Guam Open Research Exchange activities.

Appendices

A. History of the AI3 & SOI Asia Meetings

AI3 Meeting

No	Year	Host Institute	Place
1	1996	Temasek Polytechnic (TP)	Singapore
2	1996	Asian Institute of Technology (AIT)	Bangkok, Thailand
3	1996	Institut Teknologi Bandung (ITB)	Bandung, Indonesia
4	1997	Hongkong University of Science and Technology (HUST)	Hongkong
5	1997	AIT	Bangkok, Thailand
6	1997	Universiti Sains Malaysia (USM)	Penang, Malaysia
7	1998	Advanced Science and Technology Institute (ASTI)	Manila, Philippines
8	1998	National University of Singapore (NUS)	Singapore
9	1999	Institute of Information Technology (IOIT)	Hanoi, Vietnam
10	1999	AIT	Bangkok, Thailand
11	2000	USM	Penang, Malaysia
12	2000	AIT	Bangkok, Thailand
13	2001	ITB	Bali, Indonesia
14	2001	ASTI	Manila, Philippines
15	2002	TP	Singapore
16	2002	AIT	Bangkok, Thailand
17	2003	Keio University (KEIO) "SOI Asia Mission Statement"	Tokyo, Japan
18	2003	IOIT	DaNang, Vietnam
19	2004	Universitas Brawijaya (UB)	Malang, Indonesia
20	2004	University of San Carlos (USC)	Cebu, Philippines
21	2005	Prince of Songkla University (PSU)	Phuket, Thailand
22	2005	USM	Terengganu, Malaysia
23	2006	ITB **AI3 10th & SOI Asia 5th Anniversary Meeting "Bandung Declaration 2006"**	Bandung, Indonesia
24	2006	AIT	Huahin, Thailand
25	2007	Universitas Hasanuddin (UNHAS)	Makassar, Indonesia
26	2007	Institute of Technology, Cambodia (ITC)	Phnom Penh, Cambodia
27	2008	University of the Philippines Diliman (UP)	Manila, Philippines
28	2008	KEIO (Joint meeting with APRU) **Summit Conference: Designing the future from Asia "Statement of Summit"**	Tokyo, Japan
29	2009	USM	Penang, Malaysia
30	2009	Tribhuvan University (TU)	Kathmandu, Nepal
31	2010	Bangladesh University of Engineering and Technology (BUET)	Dhaka, Bangladesh
32	2010	Ministry of Research, Technology and Higher Education of the Republic of Indonesia (DIKTI)	Jakarta, Indonesia
33	2011	UB	Malang, Indonesia
34	2011	UCS	Cebu, Philippines
35	2012	University of Computer Studies, Yangon (UCSY) **AI3 15th & SOI Asia 10th Anniversary Meeting**	Yangon, Myanmar
36	2012	Chulalongkorn University (CU)	Bangkok, Thailand
37	2013	UB	Malang, Indonesia
38	2013	USM	Kota Kinabalu
39	2014	University of Computer Studies, Mandalay (UCSM)	Mandalay, Myanmar
40	2014	ITC	Phnom Penh, Cambodia
41	2015	UP	Manila, Philippines
42	2015	KEIO	Tokyo, Japan
43	2016	ITB **AI3 20th & SOI Asia 15th Anniversary Meeting "Bandung Declaration 2016"**	Bandung, Indonesia
44	2016	USM	Penang, Malaysia
45	2017	Universitas Sam Ratulangi (UNSRAT)	Manado, Indonesia
46	2017	UNESCO Jakarta Office Universidade Nacional Timor Lorosa'e	Jakarta, Indonesia
47	2018	ASTI	Manila, Philippines
48	2018	Universitas Syiah Kuala (UNSYIAH)	Aceh, Indonesia
49	2019	UCSY	Yangon, Myanmar
50	2019	KEIO **50th Anniversary Meeting**	Tokyo, Japan

B. Countries and numbers of participants of AI3/SOI-
   Asia 50th meeting:

Country	Participated organizations	# of participants
Japan	AITAC, AsiaSEED, HAPSMobile,IIJ, JPRS, Microsoft Corporation, MEXT, NAOJ, NTT Data, SKY Perfect JSAT Corporation, Softbank Corp, WebDINO Japan (alphabetical order) Keio University, Kurashiki University of Science and the Arts, Nara Institute of Science and Technology (NAIST).	Around 40
Indonesia	UNESCO Jakarta Office, Institut Teknologi Bandung (ITB),Universitas Hasanuddin (UNHAS),Universitas Brawijaya (UB), Universitas Sam Ratulangi (UNSRAT), Universitas Syiah Kuala (UNSYIAH),	16
Nepal	Tribhuvan University (TU)	2
Thailand	Asian Institute of Technology (AIT), Chulalongkorn University	2
Myanmar	University of Computer Studies, Mandalay (UCSM), University of Computer Studies, Yangon (UCSY),	3
Bangladesh	Bangladesh University of Engineering and Technology (BUET)	1
Malaysia	Universiti Sains Malaysia (USM)	1
Cambodia	Institute of Technology of Cambodia (ITC)	1
Timor-Leste	Universidade Nacional Timor Lorosa'e (UNTL)	1
Australia	Asia Pacific Network Information Centre (APNIC)	1
Philippines	Department of Science and Technology (DOST) Advanced Science and Technology Institute (ASTI), Philippines	1

Total: about 70 participants from 11 countries.