



ITUKALEIDOSCOPE

NANJING 2017

Challenges for a data-driven society

Tutorial: On the Prospect of Academic Contributions to ITU Standardization

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ITU-T Study Group 13





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- Self introduction
- Standards and standardization
 - What are standards and standardization?
 - Why are standards important?
 - Why is education about standardization important?
- ITU as an SDO
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 - Opportunity for academia
 - My involvement with ITU and Kaleidoscope
- Conclusion



Self introduction

- Education

- Schooling: Nepal
- Bachelor: India (PEC, Chandigarh)
- Masters: South Korea (SNU, Seoul)
- PhD: Japan (Sokendai, NII)



- Work

- Senior Researcher at NICT (since 2006.10)
- Visiting Associate Professor at UEC (since 2013.4)



- ITU

- Rapporteur of ITU-T Study Group 13 Question 22
 - Responsible for standardization of upcoming network technologies of IMT-2020/5G
- Participating in Kaleidoscope since the first conference (2008)





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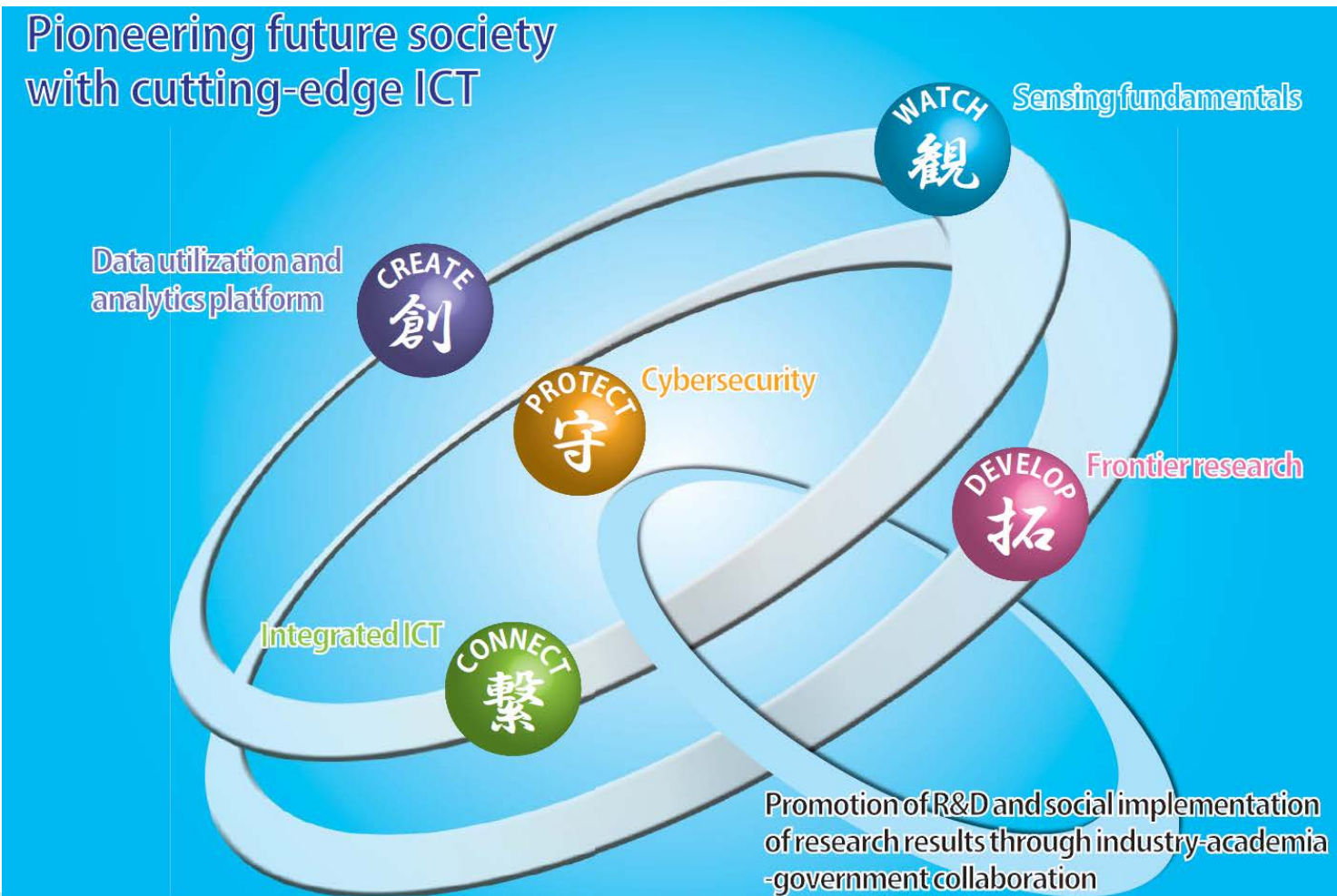
Introduction to my organization



- National Institute of Information and Communications Technology
- A national research institute under MIC (総務省)
- Location/branches:
 - Tokyo (HQ), Yokosuka, Keihanna, Kobe, Sendai, ...
- Number of employees: 1029 (2017.4)
- More:
 - Homepage: <http://www.nict.go.jp>
 - English pamphlet: <http://www.nict.go.jp/en/data/pamphlet/index.html>



NICT research areas





Standards and standardization

- What are standards?
 - Definition from ISO (www.iso.org/standards.html): A standard is a **document** that provides **requirements, specifications, guidelines** or characteristics that can be used consistently to ensure that **materials, products, processes and services are fit for their purpose**.
 - Definition from IEEE (standards.ieee.org/develop/overview.html): Standards are **published documents** that establish **specifications and procedures** designed to maximize the **reliability of the materials, products**, methods, and/or services people use every day. Standards address a range of issues, including but not limited to various protocols to help maximize **product functionality and compatibility**, **facilitate interoperability** and support **consumer safety and public health**.
- What is standardization?
 - is the process of **developing standards by standard develop organizations (SDOs)** and **implementing by relevant stakeholders**.



What are SDOs?

- An SDO is an organization whose primary activities are **developing, coordinating, promulgating, revising, amending, reissuing, interpreting,** or otherwise **producing technical standards** that are intended to address the needs of some relatively wide base of affected adopters. [Wikipedia and reference therein]
- SDOs can be national, regional and international. For example,
 - TTC and ARIB (Japanese national SDOs for telecommunication and wireless communication, respectively)
 - ETSI (European Telecommunication Standards Institute) is regional SDO
 - ISO, ITU, IEC are international SDOs



Why are standards important?

- Simplify **product development** by establishing consistent protocols that can be **universally understood and adopted**
- Promote **compatibility and interoperability**
- Speed **up time-to-market**
- Help to understand and **compare competing products**
- Promote **international trade, global market competition and price reduction**
- Encourage **innovation**
- Contribute **to better governance and regulation**
- Provide **opportunity to share and enhance existing practice/product**
- Increase **customer's confidentiality**



Why is education about standardization important?

- “Knowledge of standards can facilitate the transition of students from classroom to professional practice by aligning educational concepts with real-world applications.” [IEEE SA]*
- Engineers **either use standards** to develop a product or **participate in standardization process** in SDOs
 - So, engineers need to know **how to read standards**
 - need to know **how to develop standards** or about standardization process

*https://www.ieee.org/education_careers/education/standards/why.html



International Telecommunication Union (ITU)

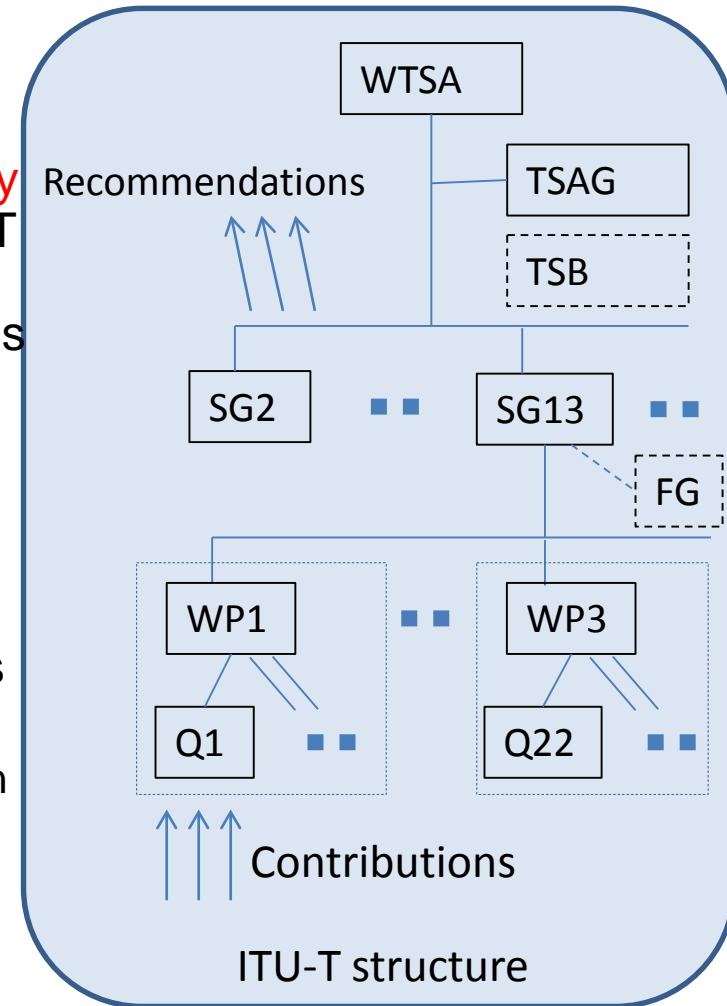


- ITU is the United Nations specialized agency for information and communication technologies, located in Geneva.
- ITU's major functions through three sectors:
 - ITU-R
 - Allocate/manage global radio spectrum and satellite orbits,
 - ITU-T
 - Develop the technical standards that ensure networks and technologies seamlessly interconnect
 - ITU-D
 - Improve access to ICTs to underserved communities worldwide.
- Technical standards are developed through contributions received from members.



ITU-T standardization

- Standardization work is carried out by the **Study Groups (SGs)** in which representatives of ITU-T membership participate to develop standards (called **ITU-T Recommendations**) for the various fields of telecommunications.
- There are 11 Study Groups in ITU-T
 - e.g. Study Group 13 – Future Network, Study Group 17 – Security
- In each Study Group, there are several **Questions**, each writing technical specifications of a specific topic
 - e.g. Study Group 13 has 13 Questions, Question 22 is for writing standards on ICN and upcoming network technologies.





- Each Question may meet many times between SG meetings in form of Rapporteur meetings to review **Contributions** from the members to initiate or progress **draft Recommendations**
 - Contributions are the proposal from members
- Once a draft is mature i.e. contains complete text, it's presented in the Study Group plenary meeting to **Consent (AAP)** or **Determination (TAP)**.
- In case of AAP, a Consented draft is sent to member states and sector members for **Last Call comments (4 weeks)**. If no comments are received, it is approved and is published as an **ITU-T Recommendation**. ... *(continue on next slide)*



.... (continued from previous slide)

- If comments are received, the draft is revised for an additional review period (3 weeks) and eventually may be approved directly. If further comments are received it is presented in the next plenary meeting.
 - It takes about **1 to 2 years time** for completing a Recommendation from its initial proposal.
- In the case of TAP approval, the process is longer as this is used for Recommendations with regulatory or policy implications which need a careful review of Member States.
- Some popular ITU-T Recommendations are E.164, H.263, H.323, X.509, Y.3001, etc.



ITU membership types

- 193 Member States
- 539 Sector Members
 - Sector granularity
- 163 Associates
 - SG granularity
- 125 Academia
 - Can involve in all sectors
 - Can be editor, rapporteur, but not vice/chair of Study Groups; no voting rights

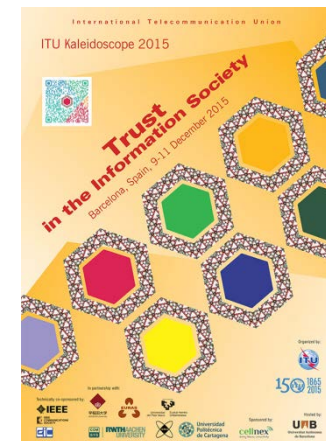
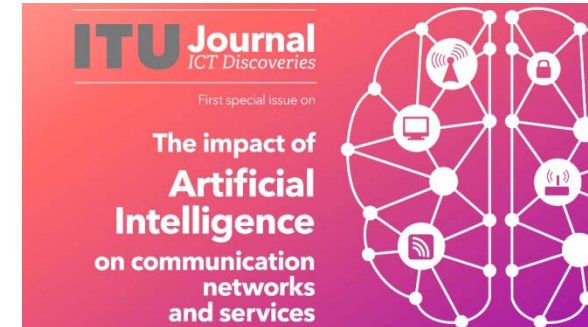
Data source: ITU website access on Nov 7, 2017.



Opportunity for academia

** Bring your ideas on ICTs to life,
raise your academic profile and
build your career!*

1. ITU Journal: ICT Discoveries
2. Kaleidoscope conferences
3. Seminar for students
4. Lecture series
5. Internship program



*Academia and ITU-T

<https://www.itu.int/en/ITU-T/academia/>



My involvement with ITU-T standardization

- ITU-T SG13 since 2007
 - As editor of Recommendations on NGN
 - Focus Group on Future Networks
 - Edited 7 Recommendations/ Supplements
 - Rapporteur Q15 (2014-2016), Q22 (2017-)
 - ICN and upcoming technologies for IMT-2020



INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

Y.2015

(01/2009)

SERIES Y: GLOBAL INFORMATION
INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS
AND NEXT-GENERATION NETWORKS

Next Generation Networks – Frameworks and functional
architecture models

**General requirements for ID/locator separation
in NGN**



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TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

Y.3031

(05/2012)

SERIES Y: GLOBAL INFORMATION
INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS
AND NEXT-GENERATION NETWORKS

Next Generation Networks – Future networks

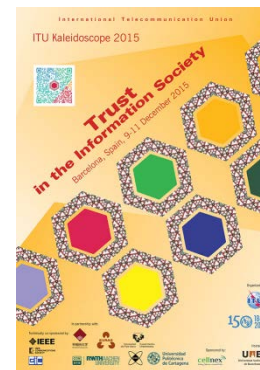
Identification Framework in Future Networks





ITU Kaleidoscopes

- Every year since 2008 (first)
- Many unique features
 - Theme changes every year
 - Held in various countries (four continents so far)
 - Covers important topics on infrastructures, services, policies
 - Best paper awards
 - Opportunity to publish in IEEE Communications (Standards) Magazine and other journals
 - Double-blind peer review
 - Excellent venue for human networking
 - Path leading to standardization



(2008-)2015



2016



2017



My involvement with ITU Kaleidoscopes (2)

- Participating every year since 2008 (1st)
 - Presenting papers
 - Best paper awardee (second prize) 2009, 2014
 - Best paper nominee 2010, 2016
 - TPC member since 2011 (4th)
 - Session chair since 2011



(2008)



2016



2014



2010



Related organizations/activities

- World Standards Cooperation (WSC)

- Established in 2001 by



- To strengthen and advance voluntary consensus-based standards systems
- Celebrating World Standards Day, October 14
- www.worldstandardscooperation.org/

-  International Cooperation for Education about Standardization

- Established in 2006
- As a network of individuals and organizations interested in education about standardization, an unregistered non-profit organization
- Organizes yearly workshops
- <http://www.standards-education.org/>



Conclusion

- Standards are essential for technological innovation, business, policy and governance.
- Standardization work is important and interesting.
- Academia involvement in standardization produces multifaceted benefits.
- ITU Kaleidoscope conference is an excellent venue for both academia and industry.

*Thank
You*