



Analysis on the Multi-stakeholder Structure in the IGF 2008-2013 Discussions

February 22, 2014

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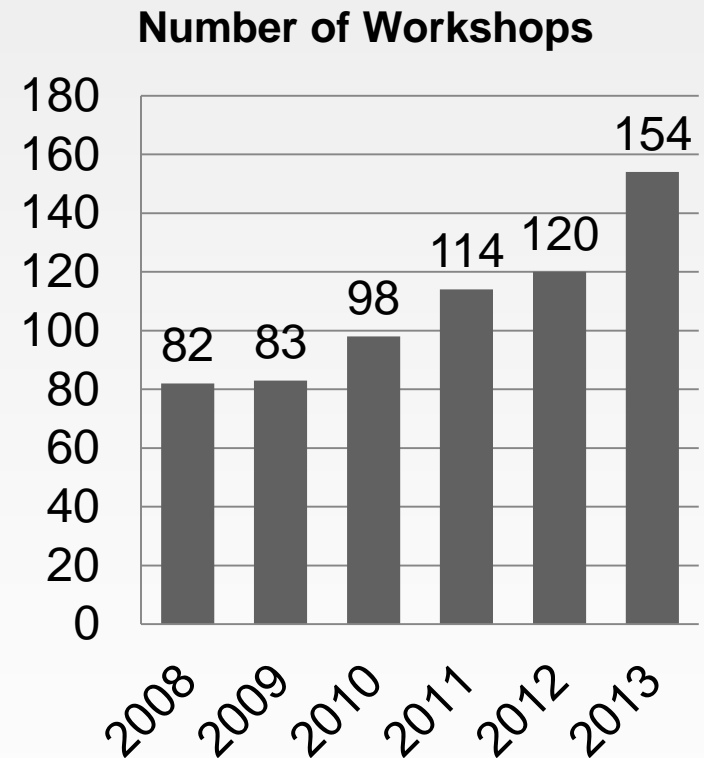
Analysys

- Data Source

- Proposed Documents of Workshops to the IGF, from 2008 to 2013
- Preprocessing
 - Convert to US-English
 - Eliminate Stopwords(NLTK)
 - Word Stemming
 - Eliminate low-frequent words(< 3 sentences)
 - Eliminate too common words
 - 'govern', 'issu', 'workshop', 'internet', 'discuss'

- Methods

- Dynamic Topic Model [Biel, 2003]
 - Number of Topics: 25
 - $\alpha=0.01$
 - Number of Cycles: 200

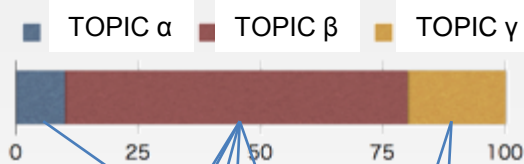


Methods (Extended LDA Model)

Dynamic Topic Model

Applying Extended LDA Model([Biel, 2003] to the Workshop Proposals

Each Sentences has Multiple “Topics”



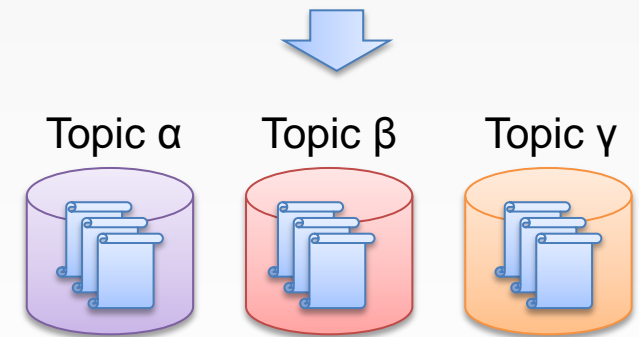
WS#1310

The workshop will discuss the following topics: - What is capacity building against **cybercrime?** - What is success? - Can **technical** assistance projects reinforce **human rights**, rule of **law** **safeguards** and **data** protection standards in the fight against **cybercrime?**

Hilgnted words has the background “Topics”

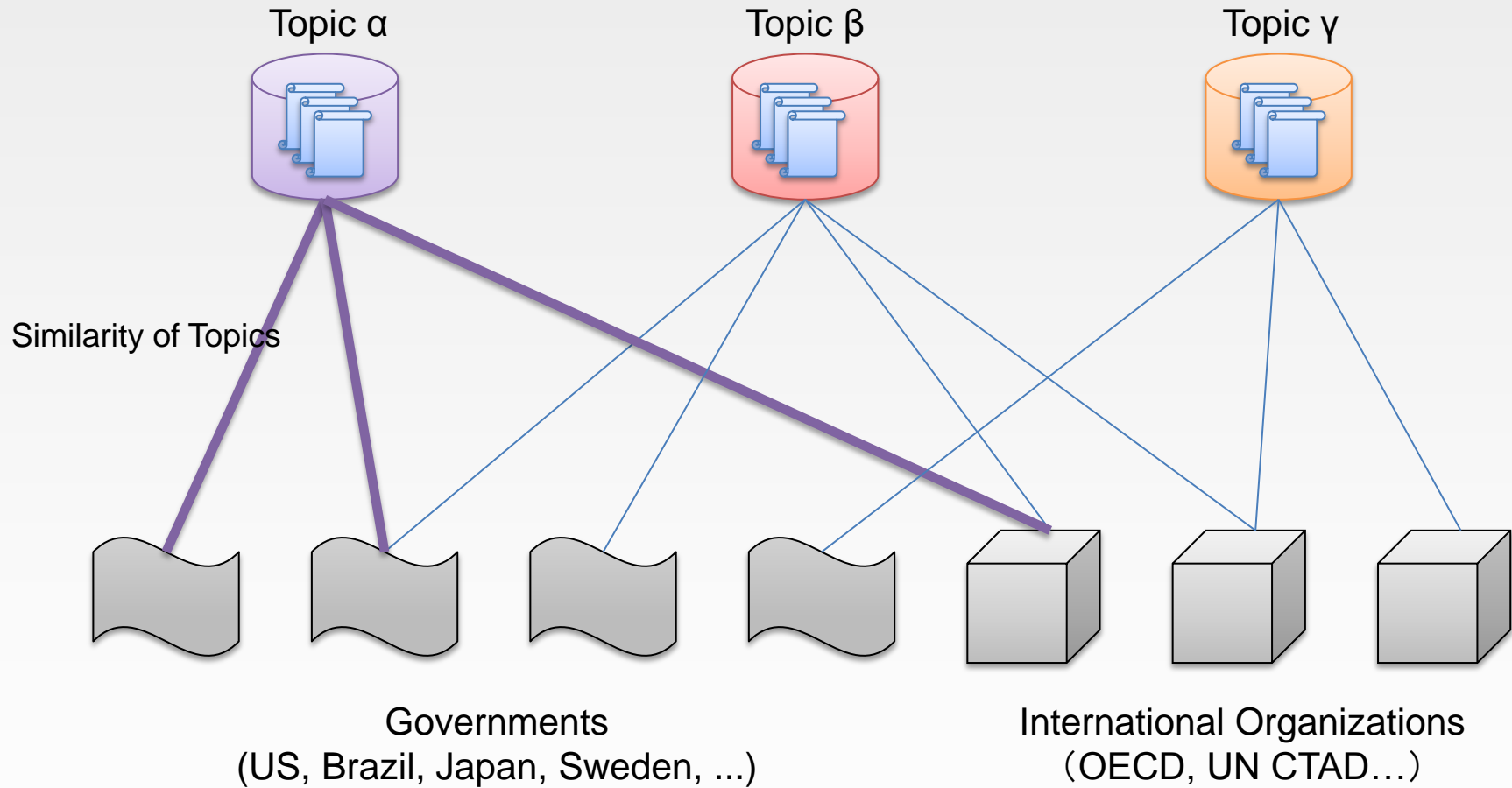
WS ID	Topic α	Topic β	Topic γ	Related Topic ($\phi > 0.3$)
001	<u>0.70</u>	0.05	0.00	α
002	0.01	<u>0.60</u>	0.10	β
003	<u>0.40</u>	0.00	<u>0.30</u>	α, γ

For each sentence, define topics with $\phi > 0.3$ as “Related Topics”



Generate Groups of Workshops
(Duplications are allowed)

Method (links between topics and participants)



Results (“Topics”, Keywords and Workshops)

Part of Extracted Topics

Topic number	Φ 15 Dominant Words	Dominant Workshops (year)
0	domain, level, manag, space, name, impact, oper, introduct, code, deploy, model, dn, registri, cctld, infrastructur	<ul style="list-style-type: none"> - "Understanding Internet Infrastructure an Overview of Technology and Terminology"(2009) - "The Governance Issues of Country Code Top Level Domains"(2009) - "A new gTLD for Mediterranean region"(2009) - "New gTLD program: an opportunity for development or a mean for more digital divide?"(2009) - "Strengthening ccTLDs in Africa"(2009)
2	innov, growth, servic, econom, technolog, benefit, infrastructur, connect, help, ensur, cost, applic, devic, mobil, sustain	<ul style="list-style-type: none"> - "How Internet-Enabled SMEs Reach out to the Global Market"(2009) - "Bringing Broadband to those who need it most"(2009) - "Mobile is changing the world - challenges and opportunities are paralleled for the enterprises"(2009) - "ICTs and an Environmentally Sustainable Internet: Another Challenge of Connecting the Next Billion Internet Users"(2009) - "Mobile internet is the future-What stands in its way?"(2009)
3	secur, law, intern, cybercrim, enforc, nation, protect, cybersecur, technic, border, cyber, respons, cross, state, crime	<ul style="list-style-type: none"> - "The Internet as the Universal Service"(2009) - "National Cyber-Defense and Critical Infrastructure Protection"(2009) - "Cybercrime Treaty: Advantages for Developing Countries"(2009) - "Cybercrime strategies"(2009) - "Securing National Domains: DNSSEC and Any cast for ccTLDs"(2009)
14	natur, call, rule, european, corpor, state, nation, complex, subject, level, adopt, propos, relat, telecommun, number	<ul style="list-style-type: none"> - "The impact of the good governance of Internet on the human and sustainable Development"(2009) - "The International Telecommunication Regulations and Internet Governance: Multistakeholder Perspectives"(2009) - "Trans nationalization of Internet Governance - The way forward"(2009) - "Internet of Things"(2009) - "Internet/Telecom ‘Convergence’ and Global Internet Governance"(2009)"Internet/Telecom ‘Convergence’ and Global Internet Governance"

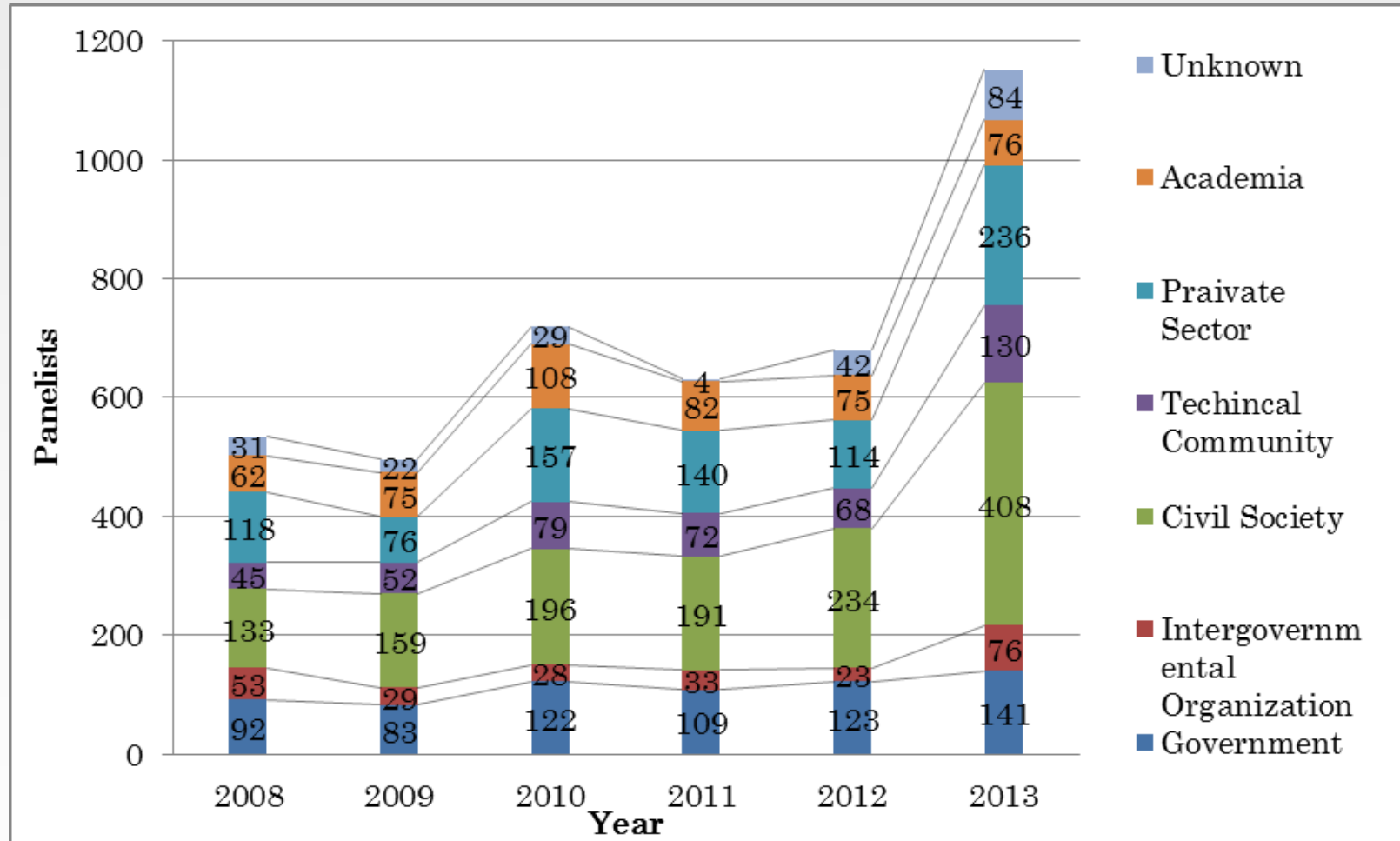
Results (Labels, Categories and Topics)

Major Topics

Category	Topic #	Topic	Number of Workshops
Technical Matter	0	Domain Names	37
	12	IP Management	39
Access and Diversity	5	Language	33
	8	Accessibility	36
	1	Diversity	36
Development	2	ICT4D	57
	13	Capacity building	67
Environment	6	Youth	42
	10	Social media	33
Law and Protection	3	Cybersecurity	32
	4	Data privacy	56
	9	Freedom of expression	73
	11	Child online protection	67
IGF and MSH-lism	7	IGF and MSH-lism	64
-	14	-	19

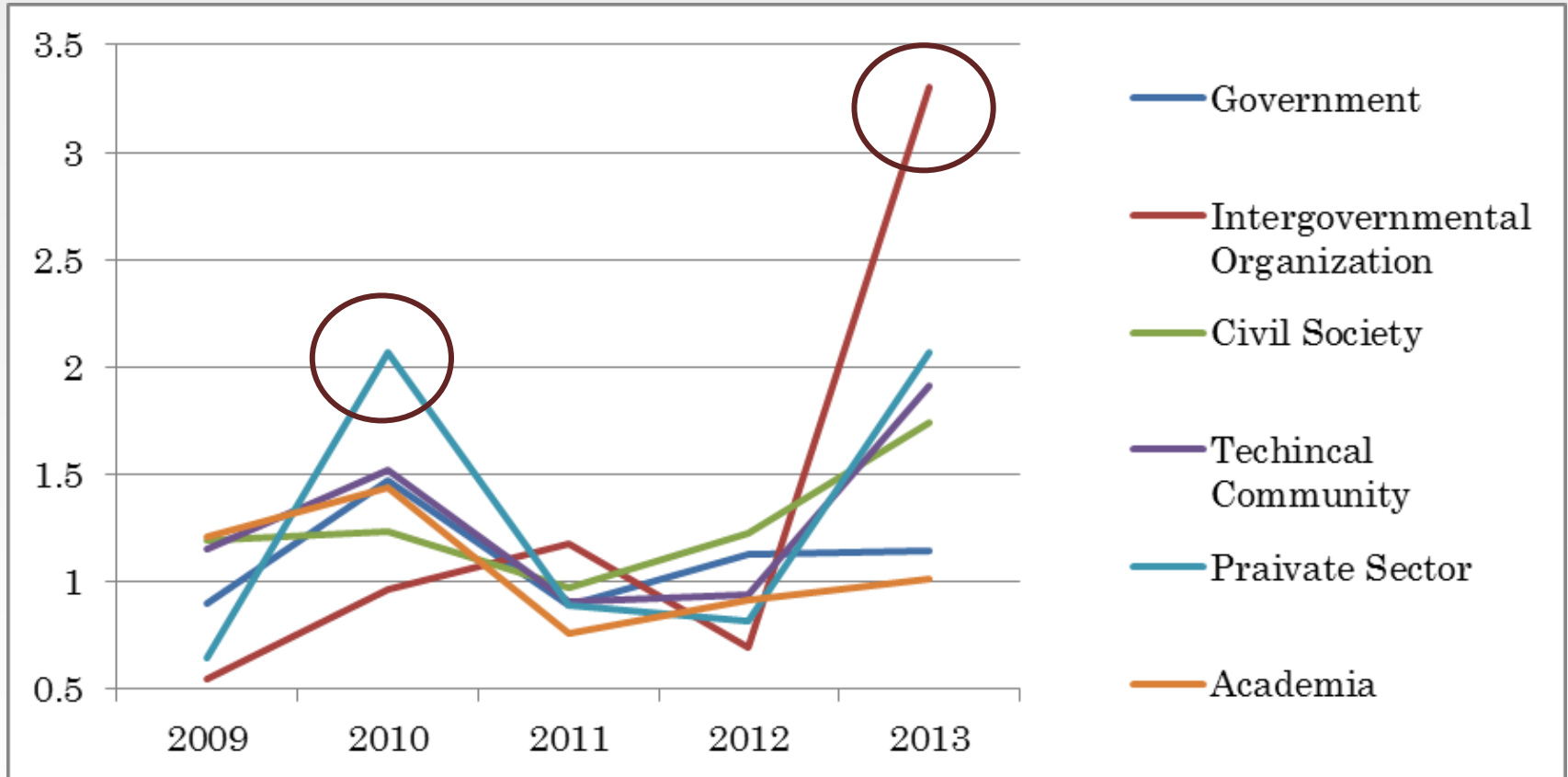
Results (Number of Panelists by Stakeholders)

Number of Participants by Stakeholders



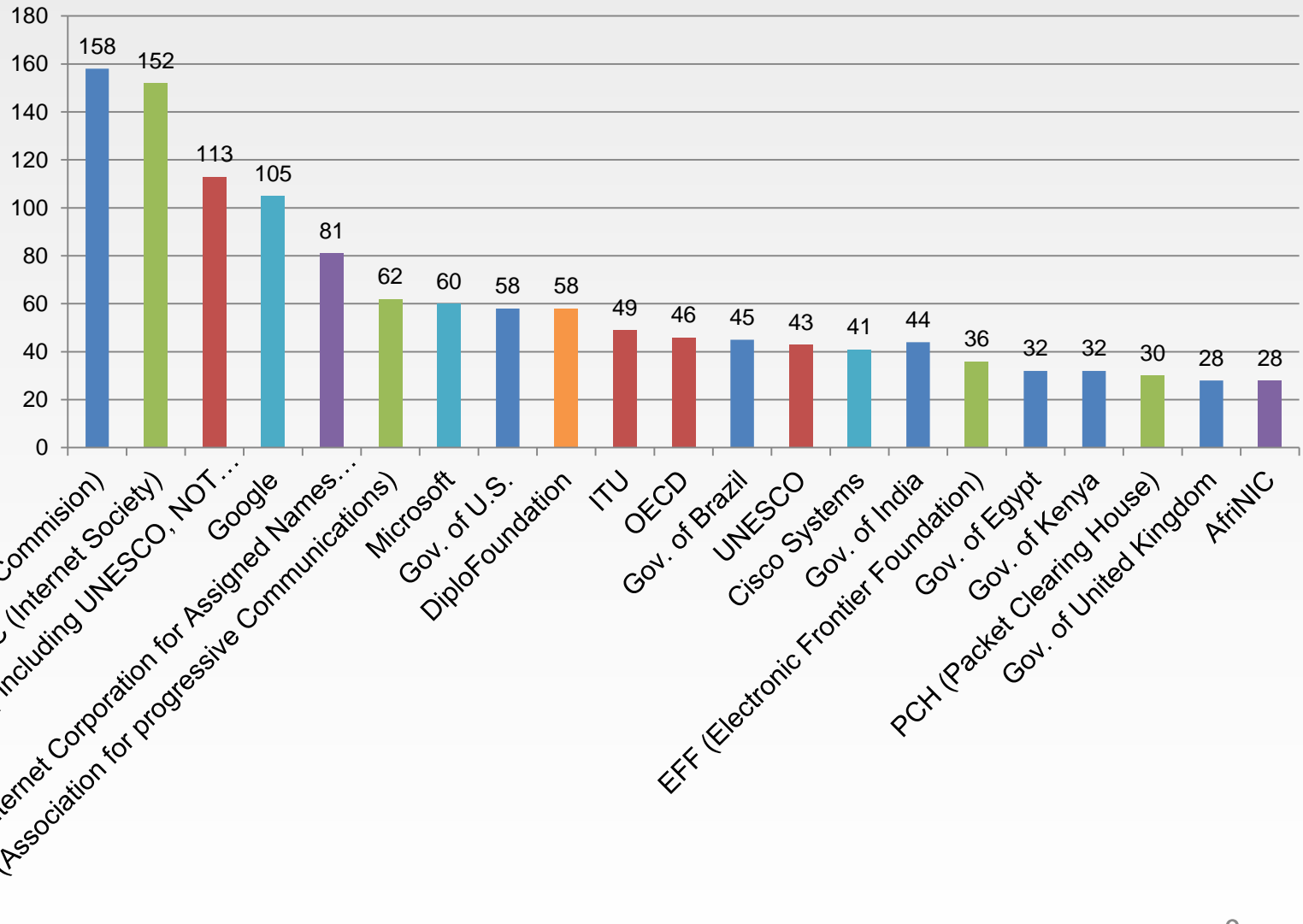
Results (Ratio of Panelists from Stakeholders)

History of Number of Panelists by Stakeholders



Results (Long Tail Distribution by Organizations)

Number of Panelists in IGF Workshops 2008-2013 by Organizations



Results (Number of Workshops by “Topics”)

Number of Workshops by Topics

UP/DOWN Percentage in (), Significant Growth in Green and Significant Decrease in Pink

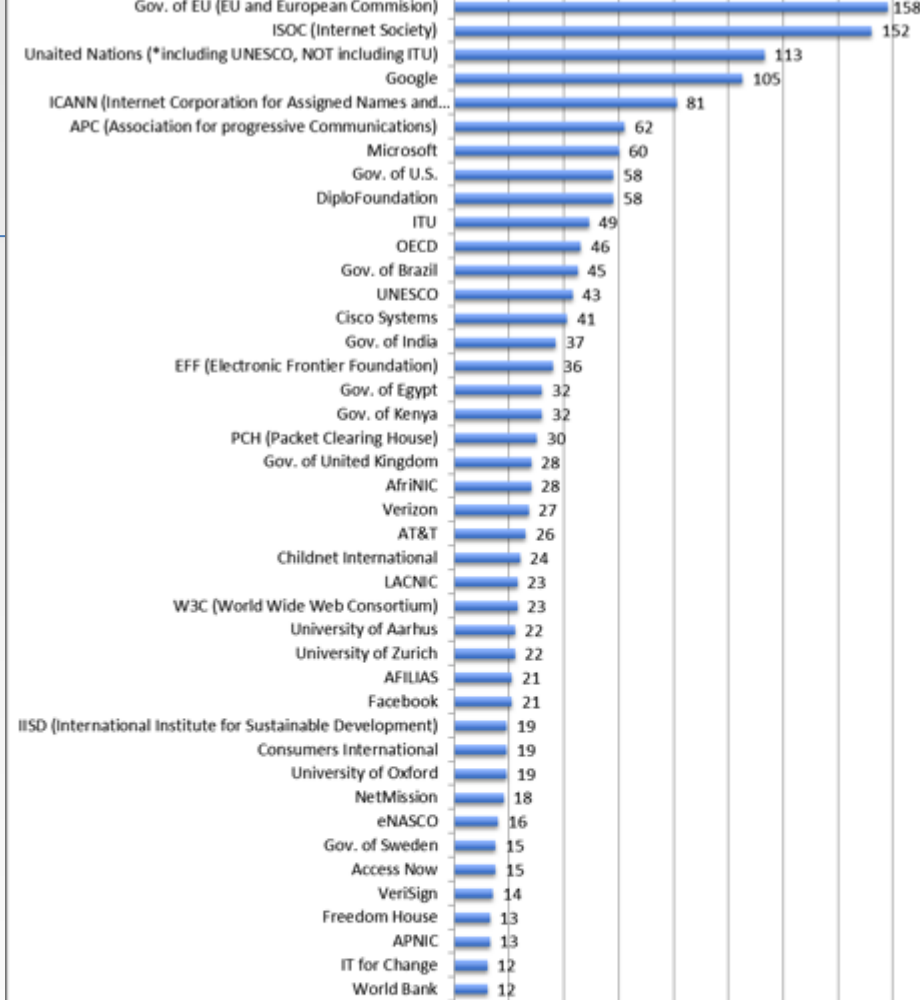
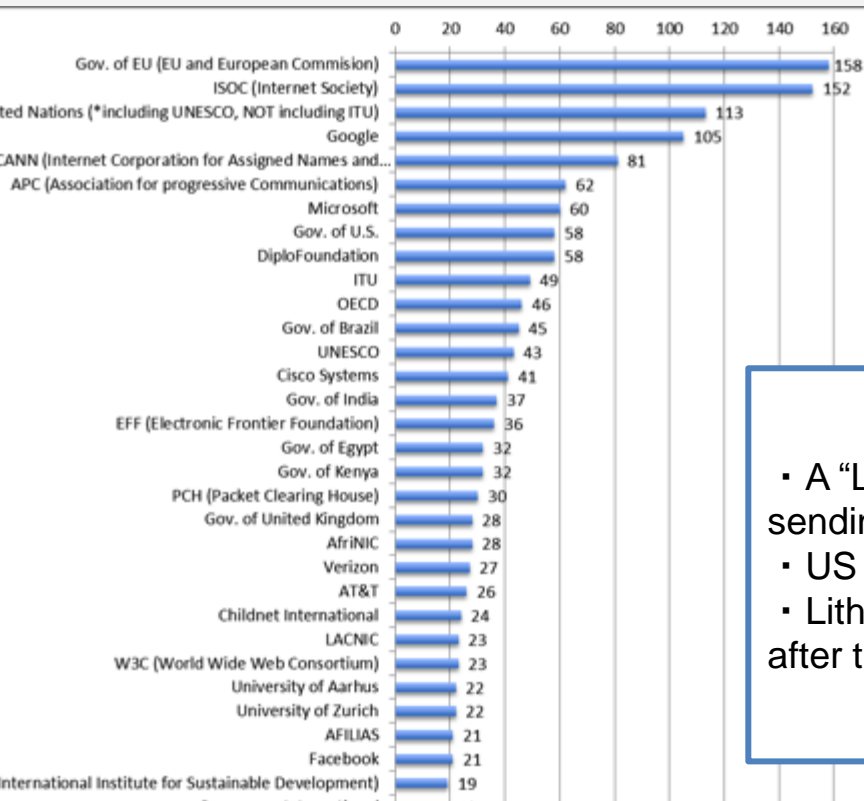
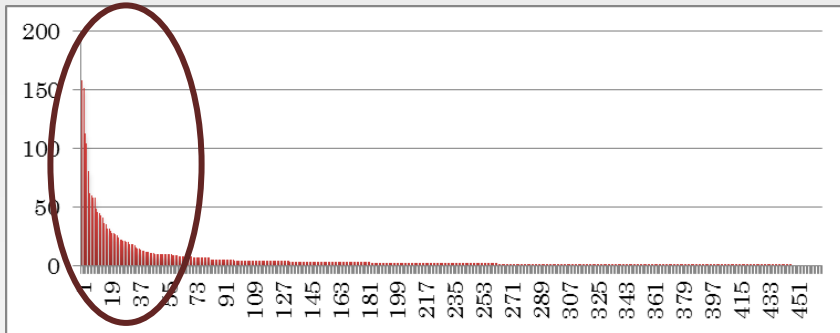
		2008	2009	2010	2011	2012	2013
Technical Matter	Domain Names	5	7 (+2)	6 (-1)	6 (0)	8 (+2)	5 (-3)
	IP Management	5	4 (-1)	7(+3)	5 (-2)	8 (+3)	10 (+2)
Access & Diversity	Language	6	6 (0)	8 (+2)	6 (-2)	2 (-4)	5 (+3)
	Diversity	1	4 (+3)	10 (+6)	8 (-2)	3 (-5)	10 (+7)
	Accessibility	11	7 (-4)	1 (-6)	4 (+3)	7 (+3)	6 (-1)
Development	ICT4D	9	9 (0)	6 (-3)	7 (+1)	9 (+2)	17 (+8)
	Capacity Building	12	16 (+4)	8 (-8)	3 (-5)	6 (+3)	22 (+16)
Environment	Youth	1	3 (+2)	8 (+5)	16 (+8)	10 (-6)	4 (-6)
	Social media	3	4 (+1)	6 (+2)	5 (-1)	8 (+3)	7 (-1)
	Cybersecurity	4	3 (-1)	1 (-2)	3 (+2)	11 (+8)	10 (-1)
Law & Protection	Data privacy	5	4 (-1)	10 (+6)	13 (+3)	14 (+1)	10 (-4)
	Freedom of Expression	4	5 (+1)	13 (+8)	9 (-4)	18 (+9)	24 (+6)
	Child Online Protection	9	17 (+8)	7 (-10)	10 (+3)	9 (-1)	15 (+6)
	IGF & MSH-lism	11	8 (-3)	8 (0)	14 (+6)	6 (-8)	17 (+11)



- 技術的な話題に関するワークショップ数はほぼ変わっていない。
- また、アクセシビリティ・多様性についてもほぼ不変。
- 一方で、開発、法と規制は流行り廃りがある。
- 開発の増加：ただし、2013年に急に増えていることを踏まえると、(1)開催地域がインドネシアであったためアジア地域からの参加者が増えた、(2)WSIS+10を控えIGFそのものの在り方を問いなおす声が高まった。

Results (Panelists by Organizations)

組織別パネリスト数



- A “Long Tailed” distributions was observed (57 organizations are sending 58.9% panelists of total 4212)
- US based Private Sectors are very actively participating
- Lithuania, Brazil, Kenya and India are keeping their activities after their hosting year

Results

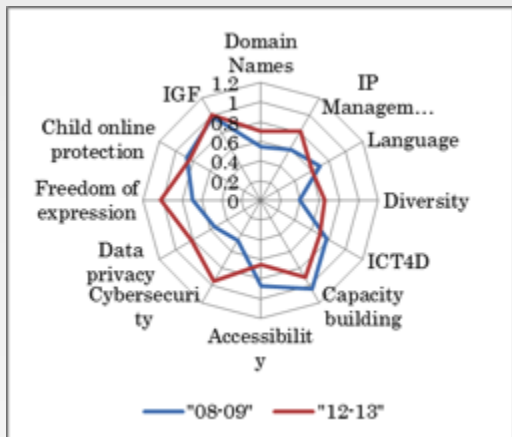
- 2008-2009: Many topics are related to “Development”
- 2010-: Topics related to legal issues and regulations are increasing

History of Dominant Topics in IGF Workshops

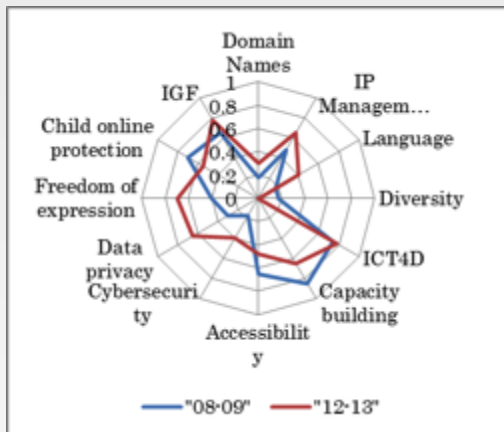
Rank	2008 年	2009 年	2010 年	2011 年	2012 年	2013 年
1	Capacity Building	Child Online Protection	Freedom of Expression	Youth	Freedom of Expression	Freedom of Expression
2	Accessi- bility	Capacity Building	Diversity	IGF and MSH-lism	Data Privacy	Capacity Building
3	IGF and MSH-lism	IGF and MSH-lism	Data Privacy	Data Privacy	Cyber-security	ICT4D
4	ICT4D	ICT4D	Language	Child Online Protection	Youth	IGF and MSH-lism
5	Child Online Protection	Accessi- bility	Youth	Freedom of Expression	ICT4D	Child Online Protection
		Domain Names	IGF and MSH-lism		Child Online Protection	

Results (Numbers of Panelists for “Topics” by Stakeholders)

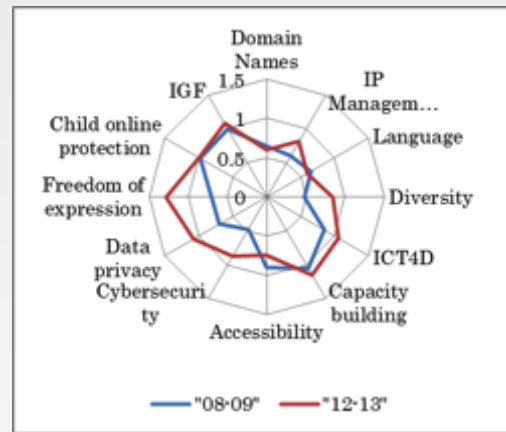
Participation Score Radar Charts by Stakeholders



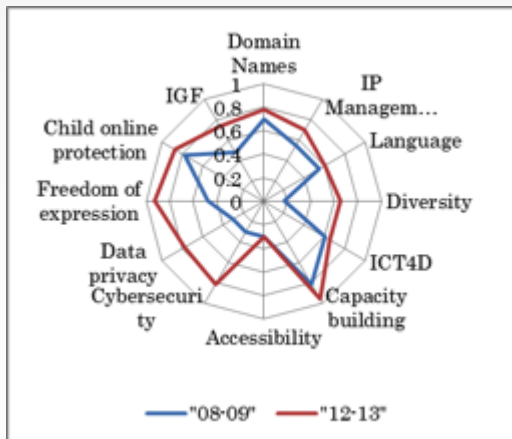
Government



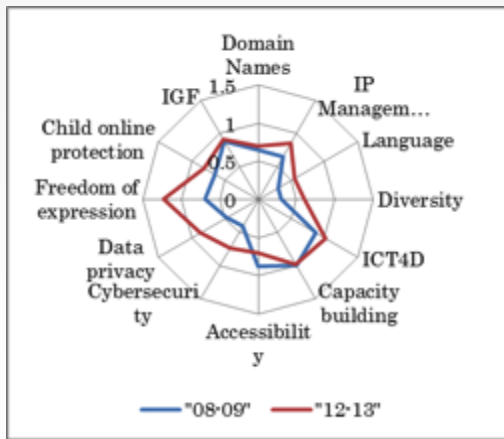
IGO



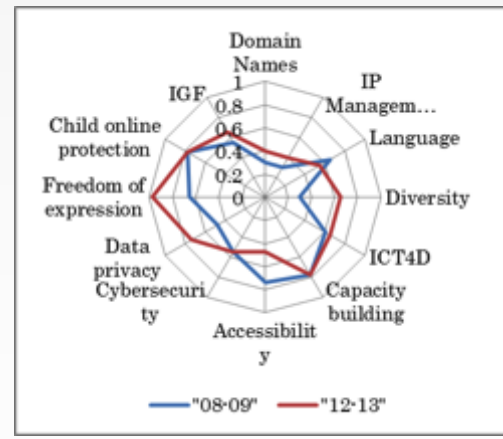
Civil Society



Tech. Comm.



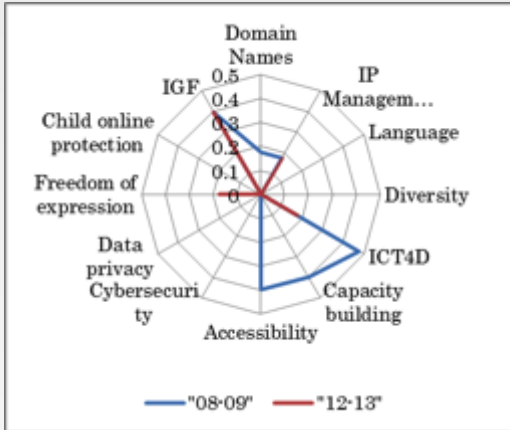
Private Sector



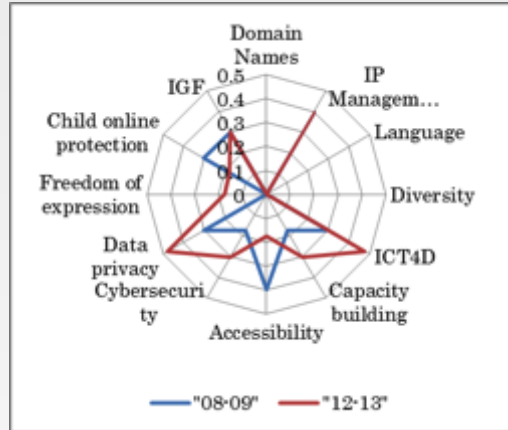
Academia

Results (Numbers of Panelists for “Topics” by International Organizations)

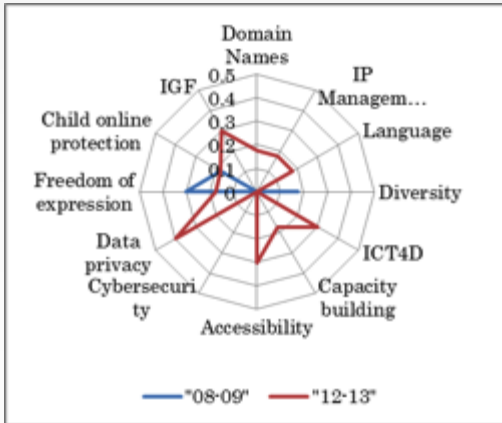
Participation Score Radar Charts by Institutes



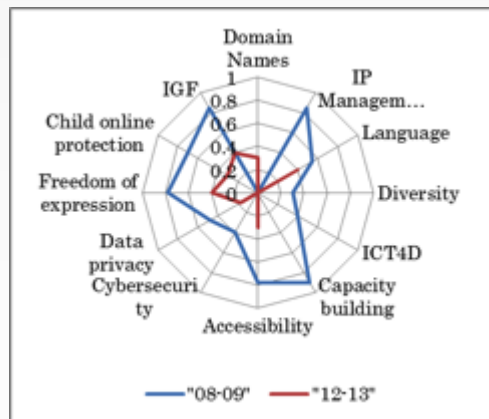
ITU



OECD



UNESCO

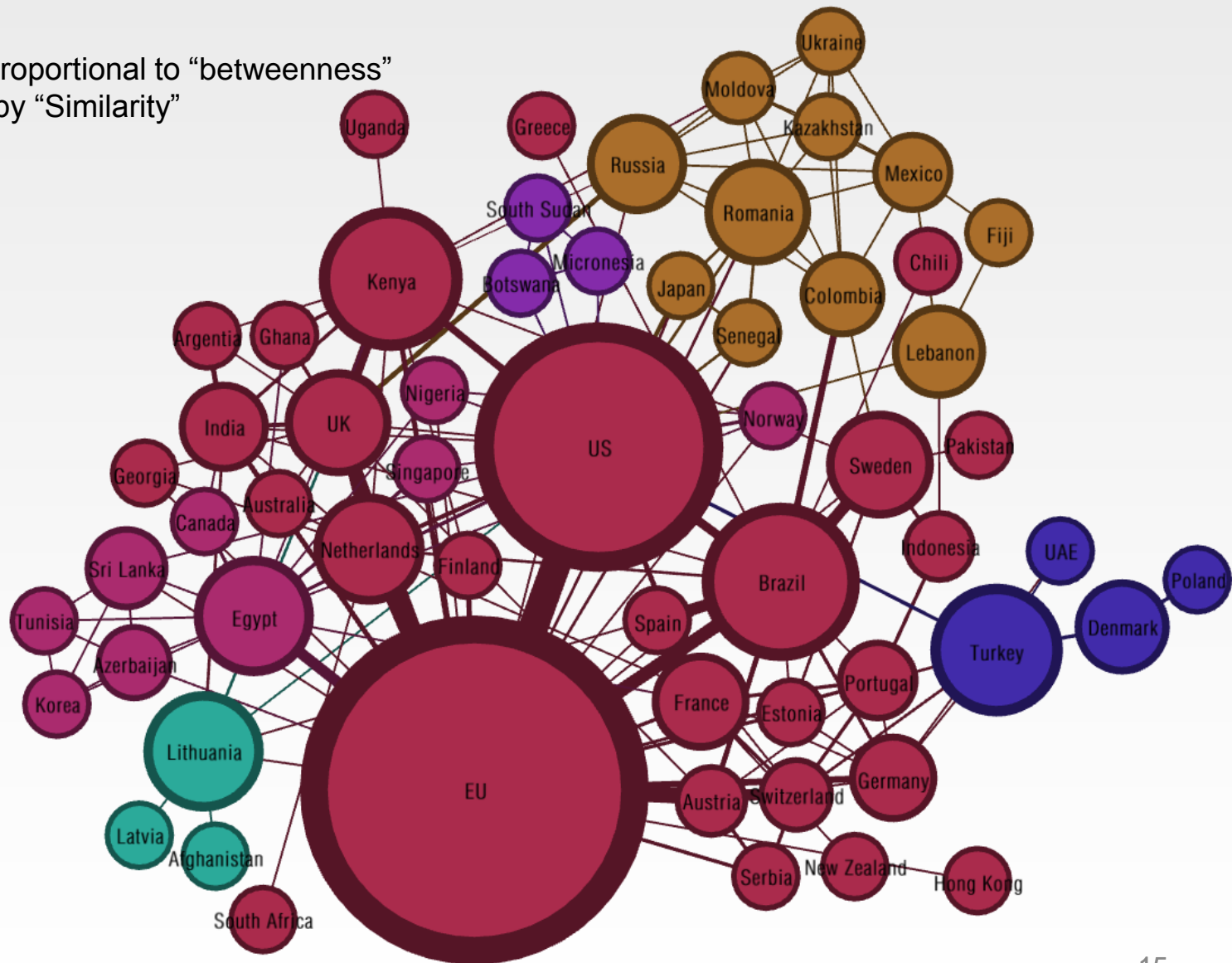


UN (all)

- ITU
 - Specialties in Technical Issues
 - Freedom of Expressions from 2012
- OECD
 - Covers most of issue categories
 - Technology related issues from 2012
- UNESCO
 - Covers most of issues
 - Exception in Cybersecurity
- UN whole
 - Less participation compared to 2018-19

Networks of Governments and Institutes (2012-2013)

Size of Each Circle is Proportional to “betweenness”
Each Circle is Colored by “Similarity”



Results (Topics and Tunis Agenda Linkage)

Topic Linkage to “Tunis Agenda”

Topic No	Label	Tunis Agenda Paras
0	IP Management	38
2, 8	Youth Participation, Support	49, 53
3	Child Safety	40, 43
5, 10, 23	Innovation, Economic Growth, Infrastructure	20
7, 24	Freedom of Expression	42
11, 17, 18, 21	IGF, MSH-lism, Private Sector, Enhanced Cooperation	52
20	Cloud & Data	39, 46

Results (Historical Topics Frequency)

Topic No	Label	Dynamic Change of Topic Proportions	Tendency
0	IP Management		-2011 down 2012- up
2, 8	Youth Participation, Support		“Youth” down “Support” up
3	Child Safety		Decreasing 2010-
5, 10, 12, 23	Innovation, Economic Growth, Infrastructure		No significant change
7, 24	Freedom of Expression		Peaked in 2013
11, 17, 18, 21	IGF, MSH-lism, Private Sector, Enhanced Coop.		Multistakeholderism and Enhanced Coop.
20	Cloud & Data		Peaked in 2010

結果

Glowing Topics : Freedom of Expression, Cloud & Data

Past Topics : Youth Participation, Child Safety

