Survey Report on the Activities of Information and Communications related Fora

(Version 11)

March 2005

The Technology Research Advisory Group

The Telecommunication Technology Committee

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1. Introduction

This year again we present the eleventh edition of our survey report on the activities of information and communications related fora.

Each year we have published the survey report on fora activities to present the trend of standardization in the information and communication technology (ICT), and every reader's support contributed to publication of the 10th anniversary edition last year. In this 11th version we have conducted the following updates of the schemes on survey and analysis to reflect the current movements seen in fora's standardization activities :

Firstly, for some years we have been conducting surveys on fora chosen by setting up selection criteria (i.e. over 300 members and set up within the past 3 years) and dividing the fora into fora for detailed survey and fora for simple surveys. However the previous survey data is different from the actual shape of fora at the present and so this time the selection criteria will be put aside and as previously all fora will be surveyed and analyzed.

This report also follows the previous format, composed of two sections: Report and Supplement.. In the first part of section 2 of the Report in addition to a table of newly added and deleted fora for the year to date, a table is added of notable recent movements amongst fora in mergers and acquisitions (M&A). In addition in each part of section 2, as classification and arrangement of all the forum activities, analysis is made based on the existing objective fields, purpose of activities and the number of affiliated members. Locations, time of establishment, and intellectual property rights are added to these further deepening the analysis. Also as a topic in section 3 of this edition, there is analysis and discussion of VoIP which is one of the factors greatly changing the ICT infrastructure, and an introduction of VoIP related standardization activities in many fora and their relation with ITU-T.

In the Supplement the results for the survey carried out for each individual forum are shown in survey sheets. With adoption of the above explained criteria for the forum selection the latest information of all fora in the covered forum list will be available.

(Note: Revision history)

FY. '94 version (Version 1)	issued in March 1995
FY. '95 version (Version 2)	issued in March 1996
FY. '96 version (Version 3)	issued in June 1997 (Japanese version only)
FY. '97 version (Version 4)	issued in March 1998
FY. '98 version (Version 5)	issued in March 1999
FY. '99 version (Version 6)	issued in March 2000
FY. '00 version (Version 7)	issued in March 2001
FY. '01 version (Version 8)	issued in March 2002
FY. '02 version (Version 9)	issued in March 2003
FY. '03 version (Version 10)	issued in March 2004
FY. '04 version (Version 11)	issued in March 2005 (this report)

2. Analysis of forum activities

2.1 New fora, fora with name changed and deleted fora in fiscal year 2004

9 new fora, 4 fora with their names changed and 6 deleted fora for survey in fiscal year 2004 are given in Tables 2.1 - 2.3, respectively.

Table 2.1 New fora

Abbreviation	Name	Purpose	Category
BSC	Biometrics Security Consortium	Others	Service (Internet)
IIC	Internet ITS Council	de facto standard	Service (ITS)
WWRF	The Wireless World Research Forum	Others	Telecommunications (Mobile communication system)
W-S	Web Service Initiative	Others	Service (Internet)
MBOA	Multi-Band OFDM Alliance	Pre-standard	Information technology (PC)
EGA	Enterprise Grid Alliance	Pre-standard	Information technology (Software)
UOPF	Ubiquitous Open Platform Forum	Implementation specifications, interoperability	Service (Home network)
NPF	Network Processing Forum	Implementation specifications, interoperability	Information technology (Software)
SAF	Service Availability Forum	Others	Information technology (Software)

Table 2.2 Fora with their names changed

Old name abbreviation	New name abbreviation	New forum name	Purpose	Category
BCDF	BSF	Broadband Service Forum	de facto standard	Service (Internet)
DHWG	DLNA	Digital Living Network Alliance	Implementation specifications, interoperability, others	Information technology (PC)
ISC	IPCC	International Packet Communications Consortium	Implementation specifications, interoperability	Telecommunications (Infrastructure)
M4IF	MPEGIF	MPEG Industry Forum	Implementation specifications, interoperability	Service (Multimedia)

Table 2.3 Deleted fora

Abbre-viation	Name	Purpose	Category
CBOP	Consortium for Business Object Promotion Non-Profit Organization UMTP/Japan (UML Modeling Technologies Promotion Convention)	Others	Information technology (Software)
H2GF	HyperLAN 2 Global Forum	Implementation specifications, interoperability	Information technology (LAN)
ITS UK	ITS United Kingdom	Others	Service (ITS)
JPNIC ENUM Research G	JPNIC ENUM Research Group	Others	Service (Internet)
MeT	Mobile Electronic Transaction Initiative	Others	Service (EC)
SSIPG	Security System with IC cards Partner Group	Others	Service (EC)

2.2 Analysis by objective field

Table 2.4 shows the results of classifying and summarizing forum activities on an objective field basis, in comparison with the results in the past three years. For those fora that span multiple objective fields, only their first objective field[1)] (the highest priority in their objective fields) were used for comparison.

2.2.1 Characteristics of the fora surveyed this fiscal year

The number of fora for this year at 103 shows a slight increase over last year. Taking the objective fields separately telecommunications increased by 1, information technology by 2 (4 added 2 lost), and the service total was unchanged (4 added, 4 lost). The result of summarizing this year's features centered on fora newly added for survey is shown below:

(1) Japan's focus on creating a ubiquitous network society

(Service: Home Network, ITS Information technology : PC)

In December 2004, a policy round table of the Ministry of Internal Affairs and Communications put together the "u-Japan Policy" that laid out a route for the development of Japan into a ubiquitous network society by 2010. Preceding this in February 2004 a Ubiquitous Open Platform Forum was established in Japan aimed at creating a new market for home information appliances. The Ubiquitous Networking Forum (set up in 2002) is also working strenuously, for example in newly setting up the Sensor Network Task Force in October 2004. The information appliance is one of the basic technologies of ICT together with IPv6, RFID, and broadband in which Japan is showing strength and there are high expectations that its profitable use will be a key in solving problems in bringing about an ubiquitous network society. Meanwhile, in order to develop Internet ITS as a basis for society the Internet ITS Consortium set up in Japan in 2002 aimed at all vehicles being networked and united in the ubiquitous society. Also the T-Engine Forum, attracting attention as a global ubiquitous computing forum originating in Japan, has shown rapid growth by expanding its membership 1.5 times this year as compared with last year (440 organizations).

(2) Remarkable growth in the web service field

(Service: Internet Information Technology : Software)

Growth in the Web service field is remarkable. In Japan in 2004 the Web Service Initiative was set up to plan for the development of a "Web service application model" to become the core of the next generation ICT through social systems such as electronic government and electronic local administrations. It is thought that in the future Web services and grid computing will be united, and in the United States in 2004 the EGA (Enterprise Grid Alliance) organization was set up to promote the standardization of grid computing which specializes in the business field. Its relationship with the preceding GGF (Global Grid Forum) is noteworthy.

(3) Biometric authorization as a counter to the leakage of personal information

(Service: Internet)

It is noted that in Japan in April of this year a law protecting personal information is coming into full effect and so countermeasures to the leakage of personal information have become an urgent matter. Biometric authorization is seen as a promising method of strengthening security, and the Biometrics Security Consortium (BSC) set up in 2003 has the objective of spreading biometrics technology and proposing effective business models.

Table 2.4 Classification by objective fields

Objective field		Fora	Number of fora			
			March 2005	March 2004	March 2003	March 2002
Tele-communi-cations	Infrastructure (Network)	ATMF, FSAN, IPCC, IPv6, MEF, MPLS & FR, MSF, OIF, RPRA, WiMAX	10	10	10	10
	Access system	ADSL, Cable Modem/DOCSIS, DSLF	3	3	4	3
	Mobile communication system	CDG, DECT Forum, GSA, GSM Association, MCPC, mITF, OMA, PHS MoU, SDR, UMTS, WWRF	11	10	11	14
	Subtotal		24	23	25	27
Information technology	Software	ASN.1, CELF, CTFJ, DOPG, EGA, ELC, FIPA, GGF, NPF, OMG, OSDL, SAF, TMForum, TOG, UbiqNet, Web 3D, WfMC	17	15	13	10
	PC	1394TA, DLNA, IrDA, MBOA, PCCA, PCISIG, PCMCIA,PICMG, Salutation, STA, T-E, UPnP, USBIF	13	12	12	11
	LAN	Bluetooth, FCIA, LONMARK,OSGi, POF, WiMedia, ZigBee	7	8	7	7
	Subtotal		37	35	32	28
Service	Internet	BSC, BSF, EJF, ENUM, ICANN, ISOC, JIF, LAP, MBA, W3C, WS, WS-I	12	11	9	11
	Multimedia	cIDF, EMF, IDF, IMTC, MOPASS, MPEGIF, OGC, TVAnytime Forum	8	8	8	10
	EC	AIM, CommerceNet, ECOM, EDIFICE, EIDX, EMA, GlobalPlatform, JICSAP, JIPPA, OASIS, SCA	11	13	17	18
	ITS	AMIC, ERTICO, IDB Forum, IIC, ITS America, ITS Forum	6	6	5	5
	Home network	DHF, ECHONET, HAVi, HomePNA, UOPF	5	4	4	4
	Subtotal		42	42	43	48
Total			103	100	100	103

2.2.2 Objective fields and location maps

When forum locations are summarized according to objective fields they appear as in table 2.5 and figure 2.1.

The following points can be concluded from the table and figure :

(1) Viewed from the location of their headquarters an overwhelming 65% are in North America, and 22% are in Japan (Asia).Europe with 12% comes next.
(2) It can be seen that the fields specialized in are as follows: North America: those concerned with general information technology, infrastructure and access related telecommunications, and internet and EC related services; Japan (Asia): Internet and home information appliances related services, and mobile communication system related telecommunications; Europe: mobile communication system related telecommunications and services related to multimedia.
(3) While North America covers all fields Japan (Asia) does not have fora related to telecommunications infrastructure and access systems, and Europe does not have fora concerned with telecommunications access systems, information technology relating to PC's or LANs, or services related to the Internet and home information appliances.
(4) In the future the development of new forum activity is expected directed towards the structuring of next generation networks (fixed/mobile convergence networks having IP as a common backbone) and the offering of convergence services on those networks, with various regions making use of their strengths in ICT technology.

Table 2.5 Objective fields and location maps

Objective field		Number of fora	Location of fora			
			Japan (Asia)	Europe	North America	Others
Tele-communica-tions	Infrastructure (Network)	10		IPv6	ATMF, IPCC, MEF, MPLS&FR, MSF, OIF, RPRA, WiMAX	FSAN
	Access System	3			ADSL, Cable Modem/ DOCSIS, DSLF	
	Mobile Communication System	11	MCPC, mITF, PHS MoU	DECT Forum, GSA, GSM Association, UMTS, WWRF	CDG, OMA, SDR	
	Subtotal	24	3	6	14	1
Information technology	Software	17	CTFJ, DOPG, UbiqNet	FIPA	ASN.1, CELF , EGA, ELC, GGF, NPF, OMG, OSDL, SAF, TMForum, TOG, Web 3D, WfMC	
	PC	13	T-E		1394TA, DNLA, IrDA, MBOA, PCCA, PCISIG, PCMCIA, PICMG, Salutation, STA, UPnP, USBIF	
	LAN	7	POF		Bluetooth, FCIA, LONMARK, OSGi, WiMedia, ZigBee	
	Subtotal	37	5	1	31	0
Service	Internet	12	BSC, EJF, JIF, MBA, W-S		BSF, ENUM, ICANN, ISOC, LAP, W3C, WS-I	
	Multimedia	8	cIDf, MOPASS	EMF, IDF, TVAnytime Forum	IMTC, MPEGIF, OGC	
	EC	11	ECOM, JICSAP, JIPPA	EDIFICE	AIM, CommerceNet, EIDX, EMA, GlobalPlatform, OASIS, SCA	
	ITS	6	IIC, ITS Forum	ERTICO	AMIC, IDB Forum, ITS America	
	Home Network	5	DHF, ECHONET, UOPF		HAVi, HomePNA	
	Subtotal	42	15	5	22	0
Total		103	23	12	67	1
Ratio			22%	12%	65%	1%

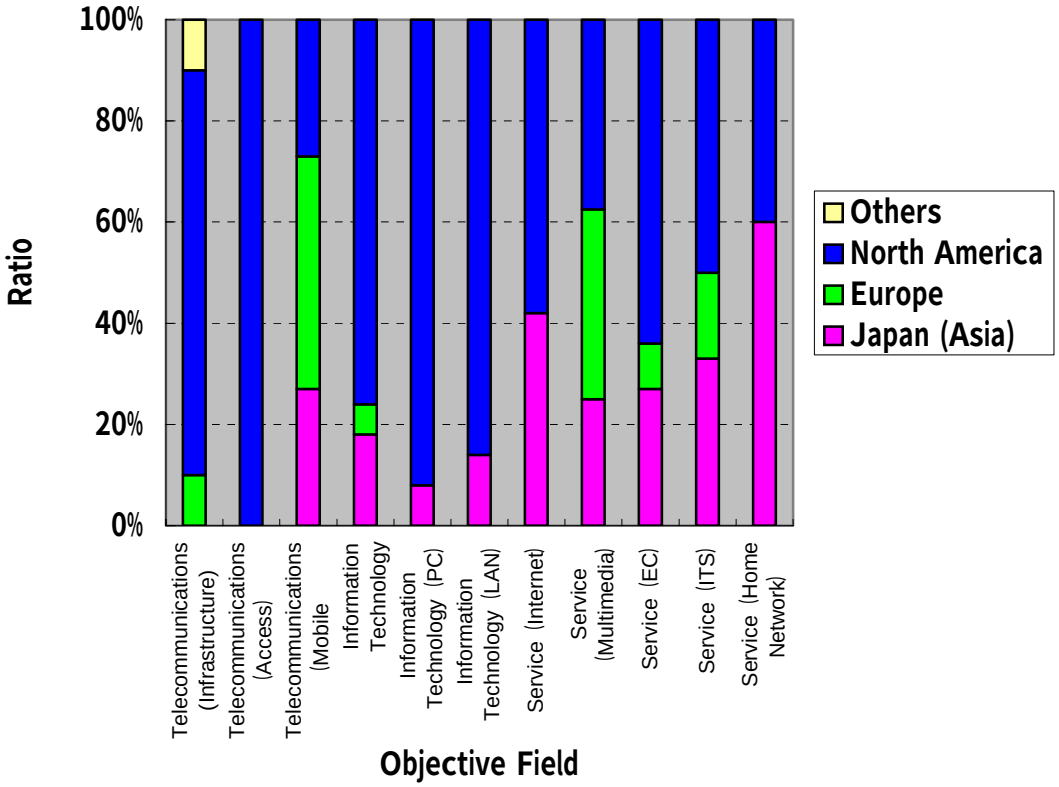

Figure 2.1 Objective fields and locations

2.2.3 Objective fields and establishment maps

When forum establishment dates are summarized according to objective fields, they appear as in table 2.6 and figures 2.2. - 2.5.

The following points can be stated from the table and figures :

(1) It took 15 years from 1983 for the number of fora to exceed 50 but after that it took only 5 years, one third of the time, to reach 100 fora.
(2) Taken by objective fields up to 1998 the percentages are 37% for information technology, service 35%, telecommunications 28%; but in 1999 the order of service and information technology were changed, and in 2004 service was 41%, information technology was 36% and telecommunications was 23%. Telecommunications has not expanded since 2002.
(3) Telecommunications expanded between 1996 and 2002 but has not increased since. The bursting of the communication bubble in 2001 seems to have had a considerable effect on this.
(4) For information technology the percentages in 1996 were PC 47%, software 37%, LAN 16% but in 2000 the order of software and PC had reversed and in 2004 software was 46%, PC 35%, and LAN was 19%. The appearance of Web services, grid computing, and open software formed a background to software expansion.
(5) In services, until 1996 EC were 50%, multimedia 22%, Internet 14%, ITS 14%, and home information appliances 0%, but after that Internet suddenly expanded and in 2004 the figure for Internet was 29%, EC 26%, multimedia 19%, ITS 14% and home information appliances 12%. As a background to Internet related services expansion, there was the explosive spread of the Internet. Also there were development of broadband, Web services and security technologies.
(6) There are 33 fora that have continued for 10 years or more and these amount to 32% of all fora. Taken by objective fields these fora were, first PC related information technology (24%), second EC related services (18%), and third on the same ratio of (9%) were software related information technology, LAN related, and multimedia related services.
(7) There are 70 fora that have not yet existed for 10 years and these make up 68% of all fora. Taken by objective fields these fora were, first software related information technology (20%), second Internet related services (14%), third mobile communication type telecommunications (13%), fourth infrastructure for telecommunications (11%), fifth on the same ratio (7%) PC related information technology, multimedia related services, EC related, and home information appliances related.

Table 2.6 Objective fields and establishment dates

Year of Establishment	Telecommunications			Information Technology			Service					Number of Fora
	Infrastructure (Network)	Access System	Mobile Communication System	Software	PC	LAN	Internet	Multimedia	EC	ITS	Home Network	
1983									EMA			1
1986									EDIFICE			1
1987			GSM Associa-tion						EIDX			2
1988				TM Forum								1
1989				OMG	PCMCIA							2
1991	ATMF									ERTICO , ITS America,		3
1992					PCCA, PCISIG		ISOC					3
1993				WfMC	IrDA	FCIA			AIM, JICSAP			5
1994		DSLF	CDG		1394TA, PICMG	LON-MAR, POF	W3C	EMF, IMTC, OGC	Commerce-Net			11
1995	FSAN	Cable Modem/ DOCSIS			Salutation, USBIF							4
1996			PHS MOU, SDR, UMTS	CTFJ, FIPA, TOG, Web 3D	STA				ECOM			9
1997	IPv6	ADSL	DECT Forum, MCPC	DOPG							ECHO-NET	6
1998	MSF, OIF		GSA			Blue-tooth	ICANN	IDF	OASIS	AMIC	Home-PNA	9
1999	IPCC			GGF	UPnP	OSGi	BSF	cIDf, TV Any-time Forum	Global-Platform, JIPPA	IDB Forum, ITS Forum	DHF, HAVi	13
2000	MPLS &FR, RPRA			ELC, OSDL			EJF, JIF	MPEG-IF				7
2001	MEF		mITF, WWRF	NPF			ENUM, LAP, MBA		SCA			8
2002	Wi-MAX		OMA	ASN.1 , Ubiq-Net	T-E	Wi-Media, Zig-Bee	WS-I	MOPASS		IIC		10
2003				CELF, SAF	DLNA, MBOA		BSC					5
2004				EGA			W-S				UOPF	3
Total	10	3	11	17	13	7	12	8	11	6	5	103

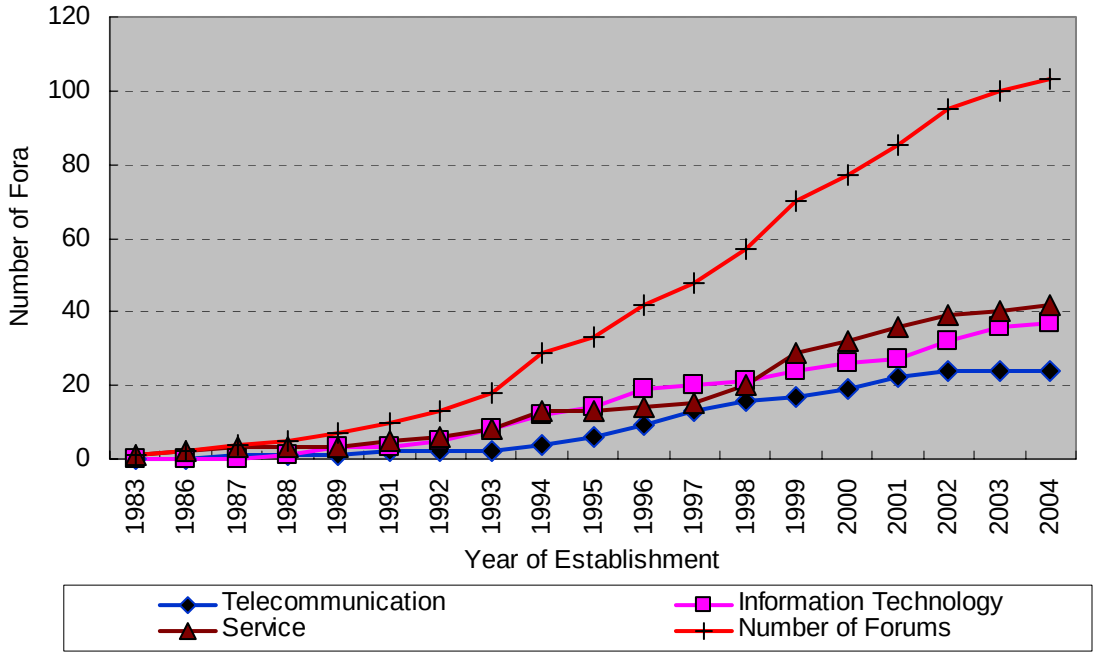

Figure 2.2 Objective fields and establishment dates (1)

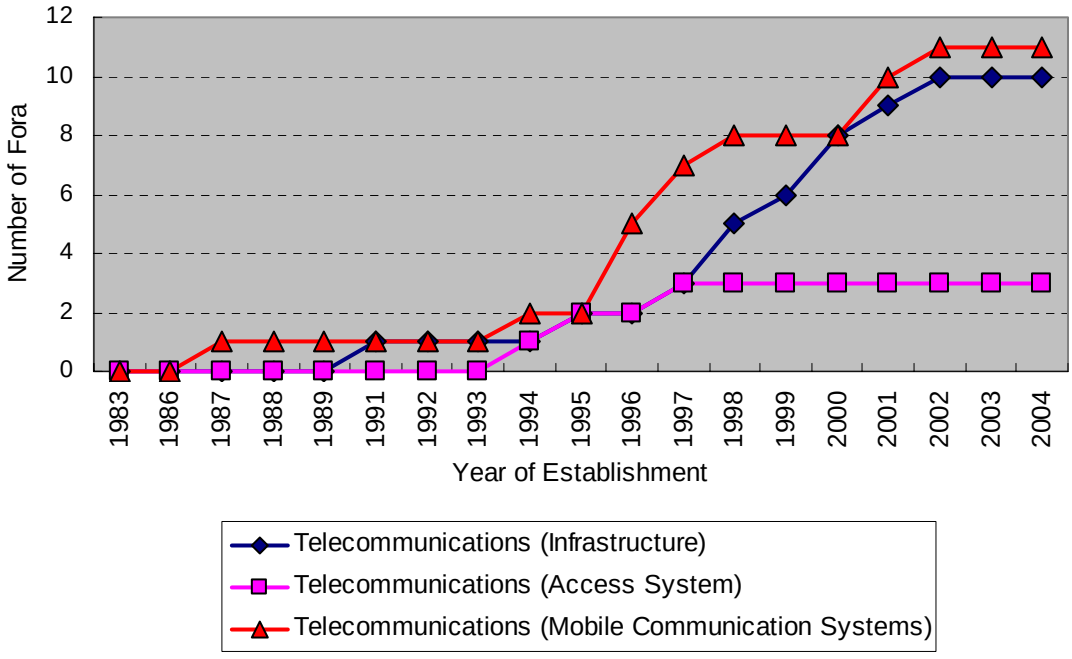

Figure 2.3 Objective fields and establishment dates (2)

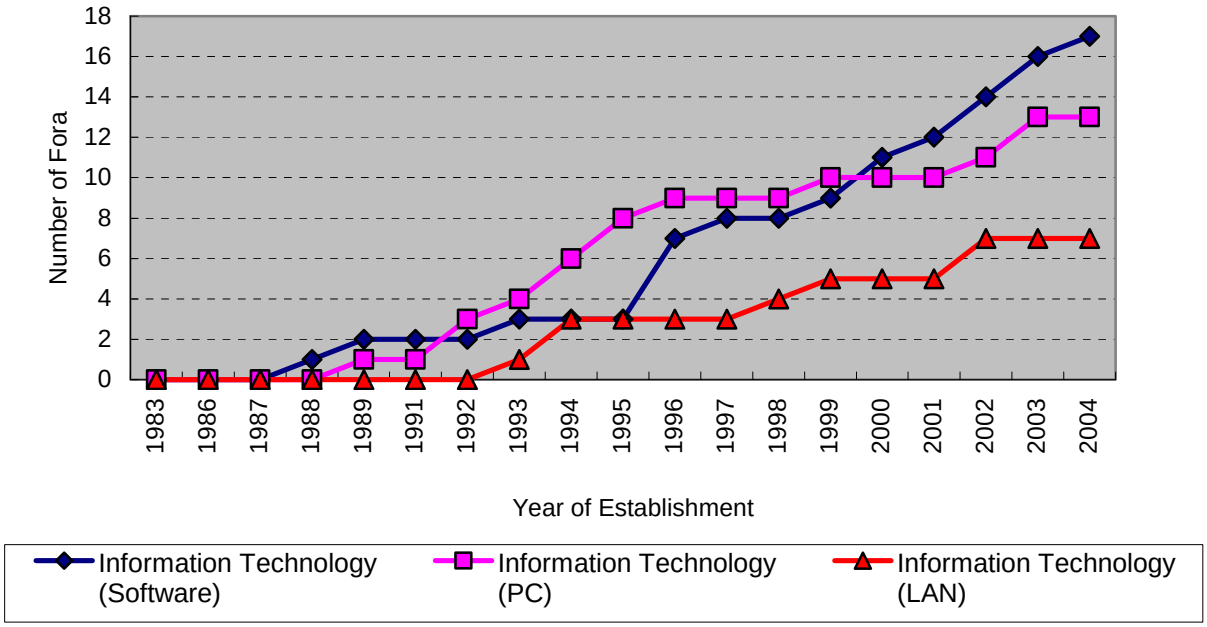

Figure 2.4 Objective fields and establishment dates (3)

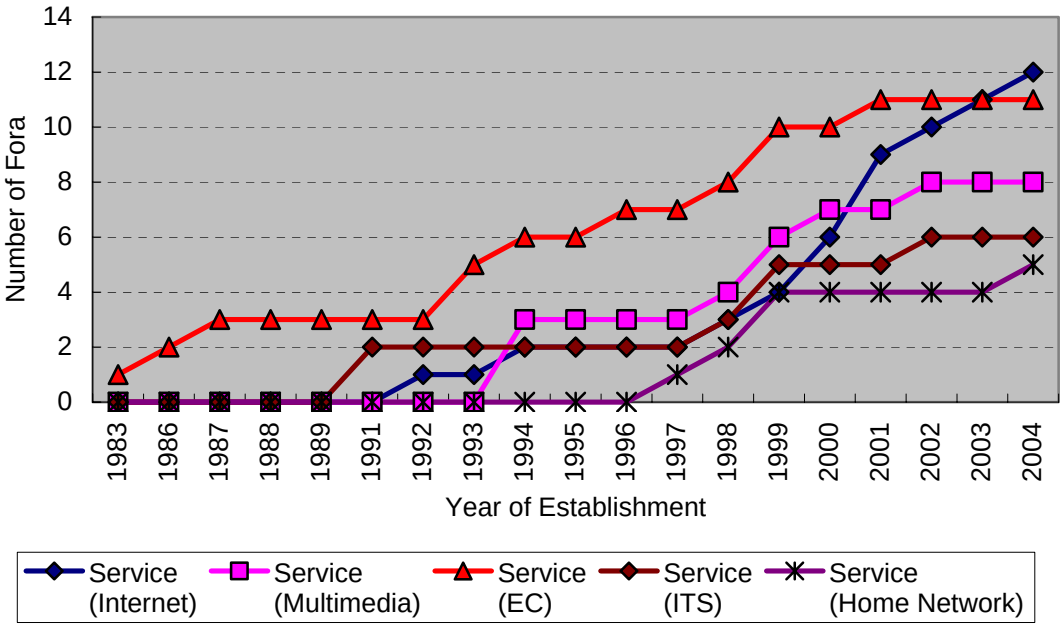

Figure 2.5 Objective fields and establishment dates (4)

2.2.4 Objective fields and membership numbers

When forum members' numbers are summarized according to objective fields they appear as in table 2.7 and figure 2.6.

The following points can be stated from the table and figures :

(1) The ratio of fora with a membership of 50 or less is highest at 34% and compared with this the ratio of fora with a membership of 101 - 200 is 23% and the ratio with 51 - 100 follows at 21%.
(2) When fora are viewed according to objective fields and membership number categories are given ranking they appear as follows:
Memberships of 50 or less are most common, and the 101 - 200 field is next.
- Service (Home Network)
- Service (ITS)
- Service (EC)
- Service (Internet)
- Information Technology (LAN)
- Information Technology (PC)

Memberships of 50 or less are most common, and the 51 - 100 field is next.
- Service (Multimedia)
- Information Technology (Software)

Memberships of 101-200 are most common, and the 50 or less field is next.
- Telecommunications (Mobile Communication System)

Memberships of 51-100 are most common, and the 50 or less field is next.
- Telecommunications (Access System)
- Telecommunications (Infrastructure : Network)

Table 2.7 Objective fields and membership numbers

Number of memberships	Telecommunications			Information Technology			Service					Number of fora	Ratio (%)
	Infrastructure (Network)	Access system	Mobile communication system	Software	PC	LAN	Internet	Multimedia	EC	ITS	Home network		
501 or more			GSM Associa-tion		PCI SIG, UPnP, USBIF	Blue-tooth				ITS America		6	6
401~500			OMA	OMG, TM-Forum	PICMG. T-E							5	5
301~400							W3C		OASIS			2	2
201~300		DSLF		TOG, WfMC		LON-MARK		OGC	ECOM			6	6
101~200	IPv6, OIF, Wi-MAX		CDG, MCPC, SDR, UMTS, WWRF		1394-TA. DLNA, MBOA, PCMCIA	Zig-Bee	EJF, LAP, WS-I	cIDF	AIM, EMA, JIPPA, SCA	IIC, ITS Forum	ECHO-NET	24	23
51~100	ATMF, IPCC, MEF, MPLS &FR	Cable Modem /DOCSIS	mITF	CELF, CTFJ, GGF, Ubiq-Net	IrDA		ENUM, ISOC, W-S	EMF, MOPASS, MPEGIF, IMTC	EDIFICE, Global-Platform	ERTICO	DHF	22	21
50 or less	FSAN, MSF, RPRA	ADSL	DECT-Forum, GSA, PHSMoU	ASN.1, DOPG, EGA, ELC, FIPA, NPF, OSDL, SAF, Web3D	PCCA, Saluta-tion, STA	FCIA, OSGi, POF, Wi-Media	BSC, BSF, JIF, MBA	IDF, TV Any-time Forum	EIDX, JICSAP	AMIC, IDB Forum	HAVi, UOPF	35	34
Unkown							ICANN		Commer-ceNet		Home-PNA	3	3
Total	10	3	11	17	13	7	12	8	11	6	5	103	100

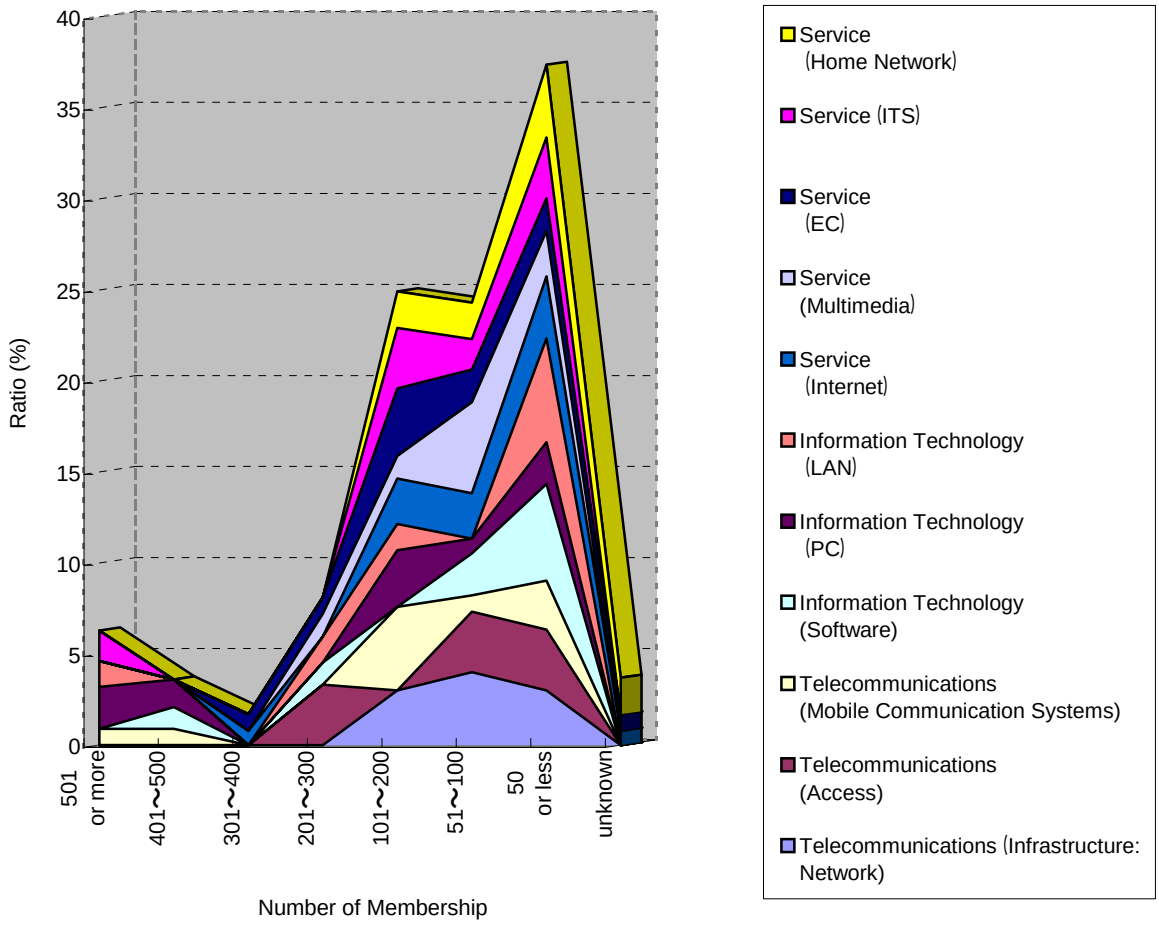

Figure 2.6 Objective fields and membership numbers

2.3 Analysis by purpose of activities

Table 2.8 shows a classification of fora according to the purpose of activities.

The purposes of activities are defined as follows:

de facto standard: To develop de facto standard.
Pre-standard: To contribute to standard development organization.
Implementation specifications/interoperability:
To develop implementation specifications and secure interoperability
Others: To conduct market researches, diffusing and enlightenment activities, information exchange, academic conferences, and so forth.

Table 2.8 Analysis by purpose of act

Purpose	Fora	Number of fora			
		2005/3	2004/3	2003/3	2002/3
De facto standards	BSF,Bluetooth, Cable Modems, DHF, ECHONET, Global Platform, HomePNA ,IIC, ISOC, OIF, OSGi, PCCA, PCISIG, PHS MoU, Salutation, TOG, TVAnytime Forum, USBIF	18	18	19	21
Pre-standards	DECT Forum, EGA, FCIA, FSAN, MBOA, OMG, PCMCIA, POF, RPRA, TMForum, Web3D, ZigBee	12	10	11	12
Implementation specifications/ nteroperability	1394TA, ADSL, ATMF, CELF, DLNA, DOPG, DSLF, EDIFICE, EIDX, ELC, ENUM, FIPA, GGF, HAVi, IDF, IMTC, IPCC, IrDA, ITS_Forum, LONMARK, MBA, MCPC, MPLS Forum, MSF, NPF, OGC, OMA, OSDL, PICMG, SDR, T-E, UbiqNet, UMTS, UOPF, UPnP, WiMAX, WiMedia, WS-I	38	36	31	31
Others	AIM, AMIC, ASN.1, BSC, CDG, cIDf, CommerceNet, CTFJ, ECOM, EJF, EMA, EMF, ERTICO, GSA, GSM Association, ICANN, IDB Forum, IPv6, ITS America, JICSAP, JIF, JIPPA, LAP, MEF, mITF, MOPASS, MPEGIF, OASIS, SAF, SCA, STA, W3C, WfMC, W-S, WWRF	35	36	39	39
Total		103	100	100	103

(1) Classification and change according to the goals of activities of this year's fora.

Changes in forum numbers classified by purpose as shown in table 2.9. This year's survey candidates have been increased by 9 fora, and 6 fora have been deleted so that as a result last years 100 fora have increased to 103 fora. Last year 11 fora were turned over

showing a substantial change but this year's change is relatively modest.

The largest change was in the "others" category where continuing on from last year there were 5 deletions comprising almost the whole total of 6 deletions. Additions were also numerous in the "others" category at 4/9, and the "Implementation specifications/ interoperability" category that was numerous till last year has not expanded much.

This year changes were numerous in the "others" and in the "Implementation specifications/ interoperability" categories comprising 80% (12/15) and this tendency is continuing at present.

Table 2.9 Changes in the number of fora covered by this fiscal year's survey

Changes in 2004	de facto standard	Pre-standard	Implementation specificatios/ interoperability	Others	Total
Added fora	+1	+2	+2	+4	+9
	IIC	MBOA EGA	UOPF NPF	BSC WWRF W-S SAF	
Deleted fora	0	0	-1	-5	-6
			H2GF	CBOP ITS-UK JPNIC-MeT SSIPG	
Changes in number of fora	+1	+2	+1	-1	+3

(2) Analysis according to location

This year a new analysis according to location has been carried out. (Refer to Table 2.10) The US comprises 2/3 at 66%, Japan has 2/3 of the remaining fora at 22% and Europe 1/3 at 12%.

The trend of US activity objectives at 2/3 is high and is close to the total trends but the "others" category is relatively low. Compared with this Japan and Europe at a ratio of about 50% in the "others" category are high. In the case of Japan this reflects the fact that there are many fora with an objective of promoting diffusion.

Table 2.10 Classification according to location

Location	de facto standards	Pre-standards	Implementation specifications/ interoperability	Others	Total for each country
US	13 (20%)	9 (13%)	27 (40%)	18 (26%)	68 (66%)
Europe	1 (8%)	1 (8%)	4 (33%)	6 (50%)	12 (12%
Japan	4 (18%)	1 (4%)	7 (30%)	11 (48%)	23 (22%)
Total	18 (18%)	12 (11%)	38 (37%)	35 (34%)	103

(3) Analysis according to objective field

Analysis according to objective field has also been commenced this year (Refer to Table 2.11).This analysis shows tendencies reflecting the characteristics of forum activity well.

Activities having “de facto standards” as their objective carry out activities spanning all fields and are not much restricted in regard to objective fields. It can be assumed that this is because the main purpose of setting up the forum is the development of de facto standards and activities are directed at that central purpose.

In contrast to this the objective for the activities of the “others” category that includes diffusion activities are centered on the so called fashion field including the Internet service field, EC related and mobile communications in the telecommunications fields. Diffusion promotion activities by fora are generally carried out focused on a short time period and so they are set up at the time required and when the purpose is accomplished (or if not accomplished when the result is understood) they are dissolved producing the most intense turnover.

The “Implementation specifications/interoperability” categories are also concentrated in the software related information technology field, the PC related and infrastructure syste in telecommunications fields. This field is a field close to applications and is said to be the fora’ strongest field. This field also has many cases of activities ceasing on completion of the objectives.

The “Pre-standard” category is limited to fields carrying out information technology and telecommunication activities. In information technology there are many cases where it is possible in some fields for the technology actually to be mastered beforehand and for limited manufacturing members to carry out standards development and their implementation. Sometimes these are confirmed as they are by international standardization bodies. The same tendency can be observed in the telecommunication field. But this activity does not occur in the service areas.

Table 2.11 Connection with objective fields

Objective field		de facto standards	Pre-standards	Implementation specifications/ interoperability	Others	Total
Tele-comunica-tions	Infrastructure (Network)	1	2	5	2	10
	Access System	1	0	2	0	3
	Mobile Communication System	1	1	4	5	11
Information Technology	Software	1	4	8	4	17
	PC	4	2	6	1	13
	LAN	2	3	2	0	7
Service	Internet	2	0	3	7	12
	Multimedia	1	0	3	4	8
	EC	1	0	2	8	11
	ITS	1	0	1	4	6
	Home Network	3	0	2	0	5
(Total by Objectives)		18	12	38	35	103

(4) Relation to date of establishment

The connection between the purpose of activities and the date of establishment can be seen as reflecting what was expected of the forum at that time in terms of needs. (Refer to figure 2.7)

The establishment of fora having “de facto standards” as an objective continued from around about 1992 to 2000 and from that time there has been virtually no establishment of new forum. At present there is virtually no activity for the establishment of new forum.

The “Implementation specifications/interoperability” and “other” categories are several years behind this trend and establishments are increasing. Recently the establishment of forum has been declining but this may be related to IT related fora showing a virtual lack of energy for a short time.

The “Pre-standard” category is not much affected by technical and market tendencies and although few in number their pace of establishment is unchanged.

Note that this statistic does not include abandoned fora or fora where activity has stopped and is limited to an analysis of fora that are currently active.

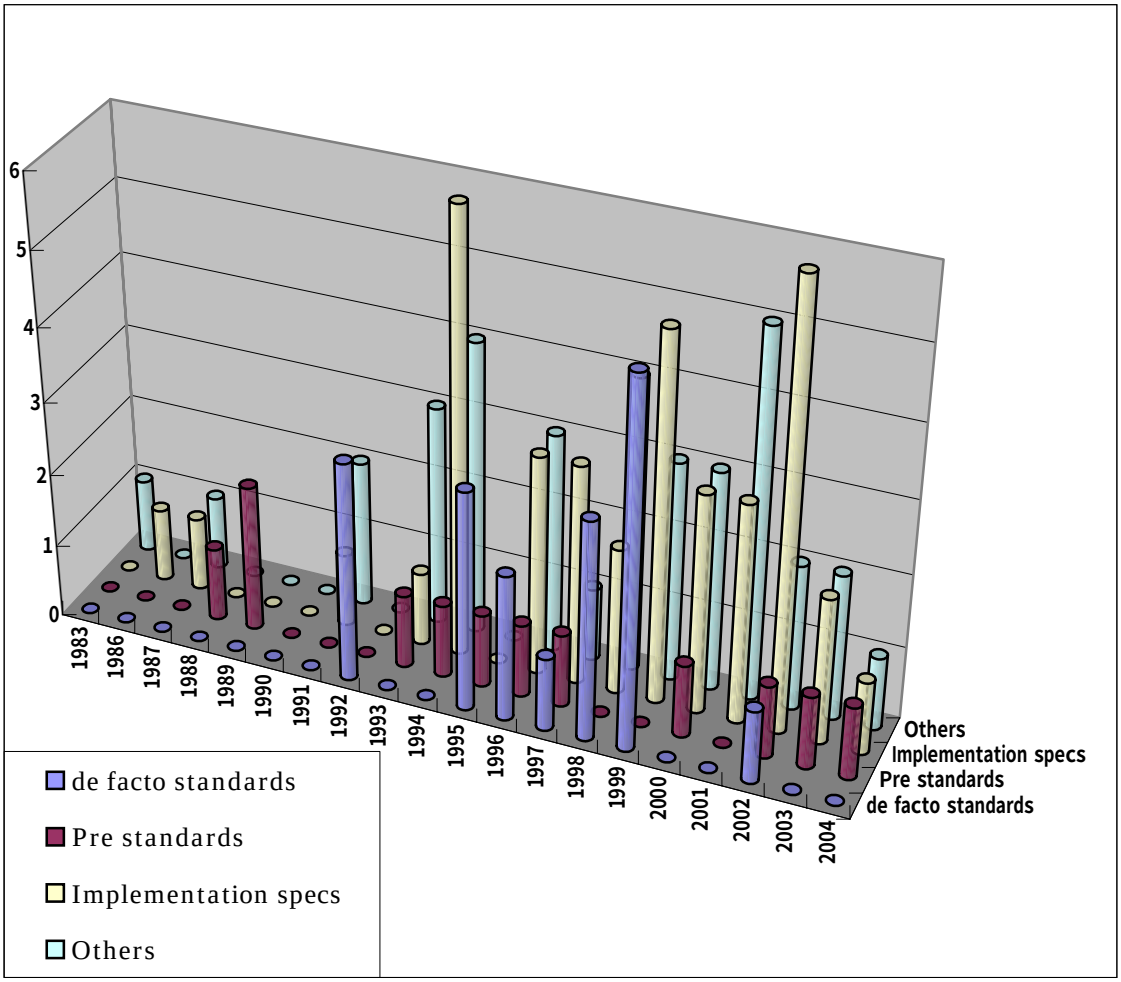

Figure 2.7 Establishment date and purpose of activity

2.4 Analysis by the number of participating members

Overseas-based fora (79), domestic-based fora (23), and a forum whose headquarters is established on a rotation basis (1) are classified according to the number of participating members.

The categories are as follows:

(1) 501 or more participating members
(2) 401 to 500 participating members
(3) 301 to 400 participating members
(4) 201 to 300 participating members
(5) 101 to 200 participating members
(6) 51 to 100 participating members
(7) 50 or less participating members
(8) Unknown number of participating number

Fora whose members are partly known, for example, in respect of principal members, but whose total number of members cannot be specified according various reference documents available, are classified under "Unknown".

For fora whose members are ranked (e.g. principal members, associate members, affiliate members, etc.), the number of members is given in terms of the total members at all ranks (excluding private individual members).

Table 2.7 shows the fora classified according to the criteria above, and the changes in the number of members that have occurred during one year from March 2003 to March 2004. Table 2.8 gives the results of the increase/decrease ratio in percentage for the number of members in comparison with the previous year surveyed results. Excluded here are the fora, which are added in the current version or of which increase or decrease percentage over the previous year is not specified.

The following show the names of the fora of which category have changed since the March 2003 report due to increase or decrease of members.

a) Due to increase of members
OMA , TMForum, T-E, DLNA, WiMAX, ZigBee, GlobalPlatform, CELF

b) Due to decrease of members
PICMG, JIPPA, ISOC, TVAnytime Forum, AMIC, ELC

There are two fora in the survey this time that doubled their membership or more: BSF and ZigBee. ZigBee's growth was remarkable and this year has greatly increased the number of its membership. In regard to BSF, as it is an organization formed from the merger of BCDF and SCF, it has twice the membership compared with previously. Also, although ITS America originally with a large membership did not double in numerical terms it has shown vitality in reaching a membership of nearly 1000 after increasing 1.5 times. On the other hand the following fora stand out especially for a large decrease in membership: ELC, -94%, AMIC, -48%, ISOC, -45%, IrDA, -33%.

The number of forum members has shown a somewhat rising tendency after a decreasing tendency to last year. This may be a reaction to the situation last year when there was a large reduction in many fora.

Changes in the membership numbers for fora divided up by fields from 2002 – 2005 is shown in Table 2.14. Divided by objective field, EC related and infrastructure type fora, showing a notable decline till last year, have turned to increase. Also while fixed membership type fora have shown an increasing tendency, multimedia related fora that

showed an increasing tendency till now have declined, and PC related fora and mobile communications systems have begun a lessening of increase.

Figure 2.8 based on Table 2.12 shows changes in classification by participating members on a bar graph and so the tendency of the changes can be picked up visually. The overall tendency is that as distinct from last year there is a tendency to increase by mid range fora classified as between 51 - 200 members and very large fora of 401 - 500 members are increasing. It is also noticeable that fora that do not make public the number of their members are increasing.

Next, Figure 2.9 analyses the purposes of activity and the classification of members' numbers. The same as last year "de facto standards", "Implementation specifications/interoperability" and "others" shows a letter "V" shaped trend.

Figure 2.10 shows the connection between the number of members and the location of the forum, and figure 2.11 shows the forum numbers by location. It can be seen that fora with numbers of 300 or more have their locations concentrated in North America, and fora with 200 or less are numerous in North America by absolute numbers and are equally established in North America, Europe, and Japan.

Figure 2.12 shows the connection between membership numbers and date of establishment. There is a tendency for fora with over 400 members to be set up when there is a big change in technology. This can be seen in the following examples: GSM Association(1987), TMForum(1988), OMG(1989), ITS America(1991), PCISIG(1992), PICMG(1994), Bluetooth(1998), UpnP(1999), OMA(2002), T-E(2002). Also since 1994 a lot of fora have been set up that have 200 or fewer members.

Figure 2.13 shows the number of fora and the date founded. The number of fora increased till 1999 and after that there was a tendency for the number established to decrease.

Table 2.12 Classification by number of participating members

Class (Note)	Fora			2005 /3	2004 /3	2003 /3	2002 /3
	Oversea	Japan	Not fixed				
501 or more	Bluetooth, GSM Association, ITS America, PCISIG, UPnP, USBIF			6 (5.9)	7 (8.0)	7 (7.0)	10 (9.7)
401 - 00	OMA, OMG, PICMG, TMForum	T-E		5 (4.9)	1 (1.0)	2 (2.0)	1 (1.0)
301 - 400	OASIS , W3C			2 (1.9)	4 (4.0)	2 (2.0)	7 (6.8)
201 - 300	SLF, LONMARK, OGC, TOG, WfMC	ECOM		6 (5.8)	9 (9.0)	12 (12.0)	5 (4.9)
101 - 200	1394TA, AIM, CDG, DLNA, EMA, IPv6, LAP, MBOA, OIF, PCMCIA, SCA, SDR, UMTS, WiMAX, WS-I, WWRF, ZigBee	cIDf, ECHONET, EJF, IIC, ITS Forum, JIPPA, MCPC		24 (23.3)	20 (20.0)	18 (18.0)	21 (20.4)
51 - 100	ATMF, Cable Modem/DOCSIS, CELF, EDIFICE, EMF, ENUM, ERTICO, GGF, GlobalPlatform, IMTC, IrDA, IPCC, ISOC, MEF, MPEGIF, MPLS&FR	CTFJ, DHF, mITF, MOPASS, PHS MoU, UbiqNet, W-S		23 (22.3)	25 (25.0)	26 (26.0)	27 (26.2)
50 or less	ADSL, AMIC, ASN.1, BSF, DECT Forum, EGA, EIDX, ELC, FCIA, FIPA, GSA, HAVi, IDB Forum, IDF, MSF, NPF, OSDL, OSGi, PCCA, RPRA, SAF, Salutation, STA, TVAnytime Forum, Web 3D, WiMedia	BSC, DOPG, JICSAP, JIF, MBA, POF, UOPF	FSAN	34 (33.0)	33 (33.0)	31 (31.0)	29 (28.1)
not known	CommerceNet, HomePNA, ICANN			3 (2.9)	1 (1.0)	2 (2.0)	3 (2.9)
Total (2005/3)	79 (76.7)	23 (22.3)	1 (1.0)	103	-	-	-
Total (2004/3)	75 (75.0)	24 (24.0)	1 (1.0)	-	100	-	-
Total (2003/3)	75 (75.0)	24 (24.0)	1 (1.0)	-	-	100	-
Total (2002/3)	76 (73.8)	25 (24.3)	2 (1.9)	-	-	-	103

Note: These numbers do not include private individual members. Only corporate and organization members are counted. Figures in parentheses represent percentage to the total number.

Table 2.13 Classification according to changes in the number of members class

Class	31% or more increase	21 - 30% increase	20% increase - 20% decrease	20% - 30% decrease	31% or more decrease
501or more	ITS America		GSM Association, PCISIG, UpnP, USBIF		Bluetooth
401 - 500	T-E	TMForum OMA	OMG	PICMG	
301 - 400			W3C , OASIS		
201 - 300			DSLF, ECOM, LONMARK, OGC, TOG, WfMC		
101 - 200	DLNA, WiMAX, ZigBee	SDR	1394TA, AIM, CDG, cIDf, ECHONET, EJF, EMA, IPv6, ITS Forum, LAP, MCPC, PCMCIA, SCA, WS-I	JIPPA OIF UMTS	
51 - 100		GlobalPlatform	ATMF, Cable Modem/DOCSIS, CELF, CTFJ, DHF, EDIFICE, EMF, ERTICO, GGF, IMTC, IPCC, MEF, mITF, MOPASS, MPLS&FR, PHS MoU, UbiqNet,		IrDA ISOC
50 or less	ADSL, BSF, MSF, OSDL	STA, Web 3D, WiMedia	ASN.1, DECT Forum, DOPG, EIDX, FCIA, FIPA, FSAN, HAVi, IDB Forum, IDF, JICSAP, JIF, MBA, OSGi, PCCA, RPRA, Salutation,	GSA, POF	AMIC ELC

Note: These numbers do not include private individual members. Only corporate and organization members are counted.
Excluding fora where the increase/decrease ratio cannot be specified (CommerceNet , HomePNA , ICANN , Cable Modem/DOCSIS) and newly added fora, the increase column is displayed in order from high increase ratios, but the decrease column is displayed in order from low decrease ratios.
Amounts of change are represented in increase or decrease percentage as of March 2005 over March 2004.

Table 2.14 Changes in number of forum members according to field (2002 to 2005)

Objective Fields	Number of fora with its number decrease				Number of fora with its number increase			
	2001-2	2002-3	2003-4	2004-5	2001-2	2002-3	2003-4	2004-5
Service (EC)	11	8	10	4	5	2	2	6
Service (ITS)	2	3	2	3	3	2	3	1
Service (Internet)	4	5	5	4	3	2	2	5
Service (Multimedia)	5	5	3	7	4	3	4	1
Service (Home Network)	1	3	2	1	2	1	2	1
Total in Service	**23**	**24**	**22**	**19**	**17**	**10**	**13**	**14**
Information technology (LAN)	4	5	4	4	3	0	2	3
Information technology (PC)	5	6	4	5	5	4	4	6
Information technology (Software)	6	8	8	6	4	2	3	6
Total in Technology	**15**	**19**	**16**	**15**	**12**	**6**	**9**	**15**
Telecommunications (Infrastructure)	3	7	7	3	5	2	1	5
Telecommunications (Mobile Communication System)	5	5	4	4	7	4	5	5
Telecommunications (Access System)	1		2	0	0	0	0	2
Total in Telecommunications	**9**	**1**	**13**	**7**	**12**	**6**	**6**	**12**
Total	**47**	**53**	**51**	**41**	**31**	**21**	**28**	**41**

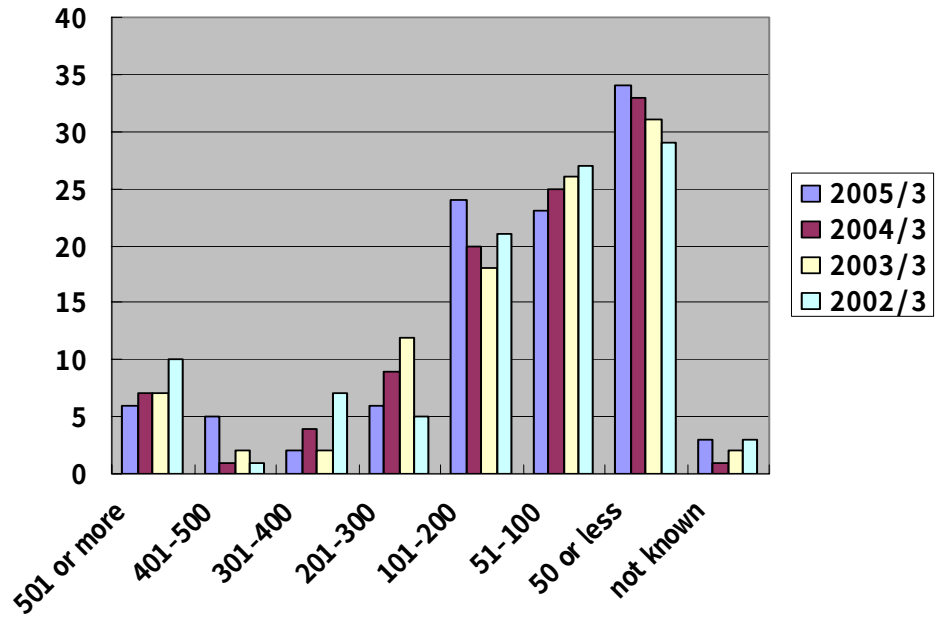

Figure 2.8 Changes in classification according to number of members

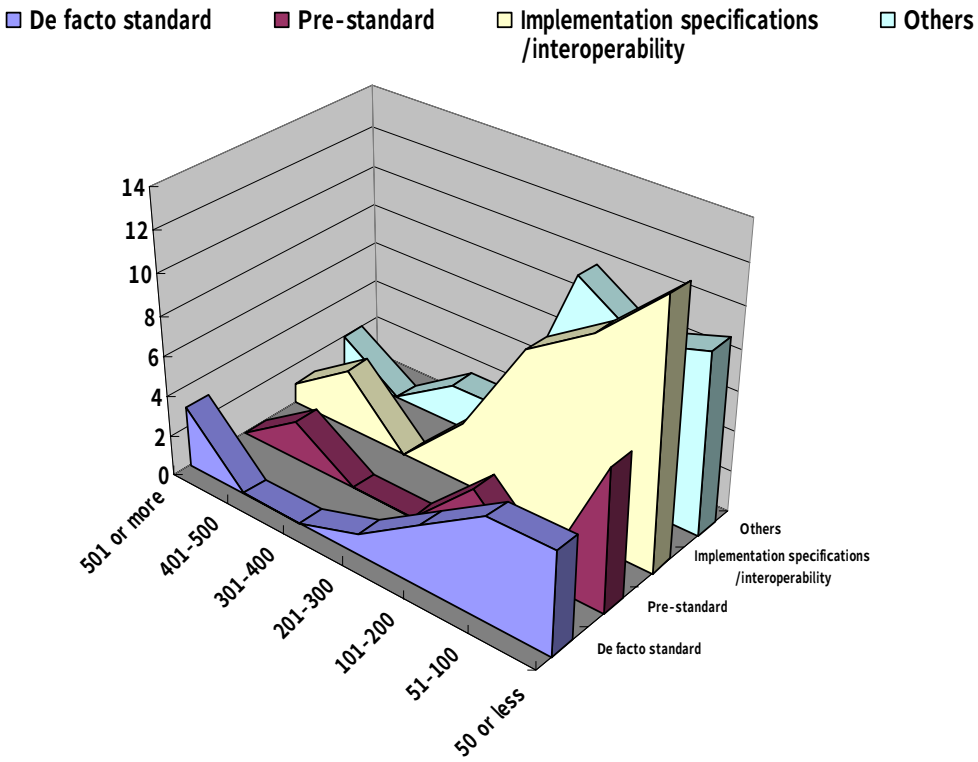

Figure 2.9 Purposes of activities and classification according to number of members

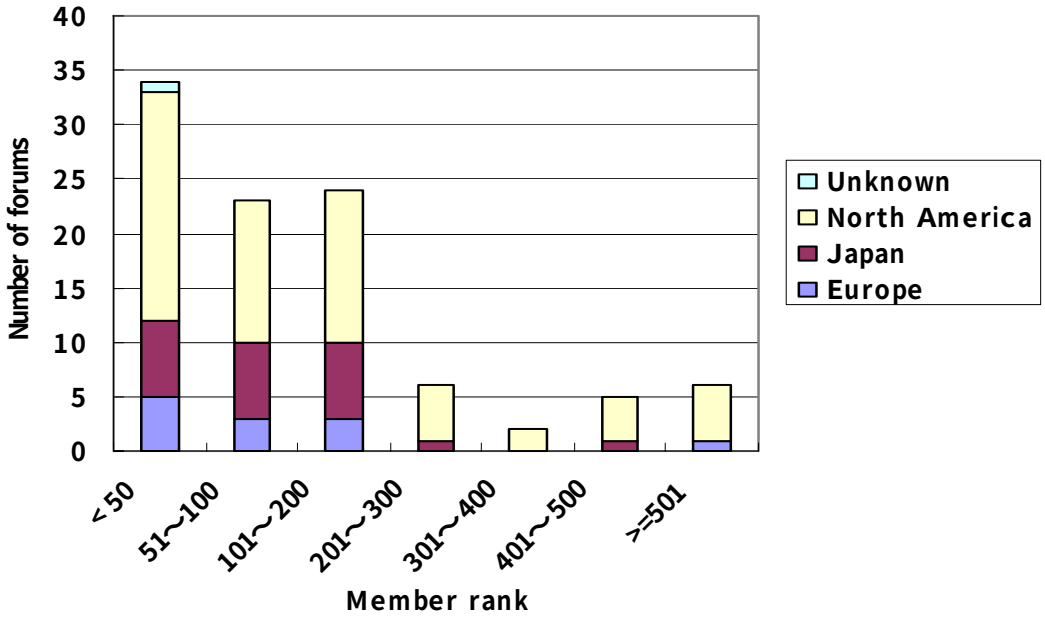

Figure 2.10 Number of members and the location of the forum

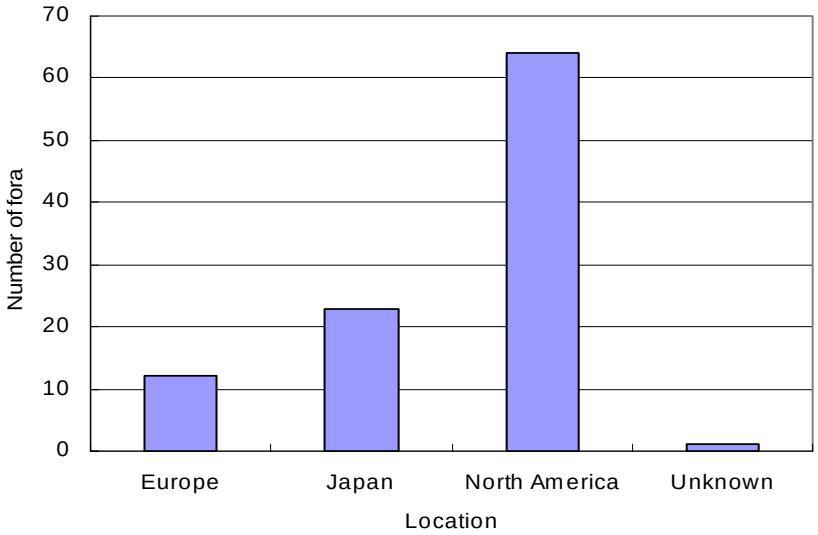

Figure 2.11 Location and number of fora

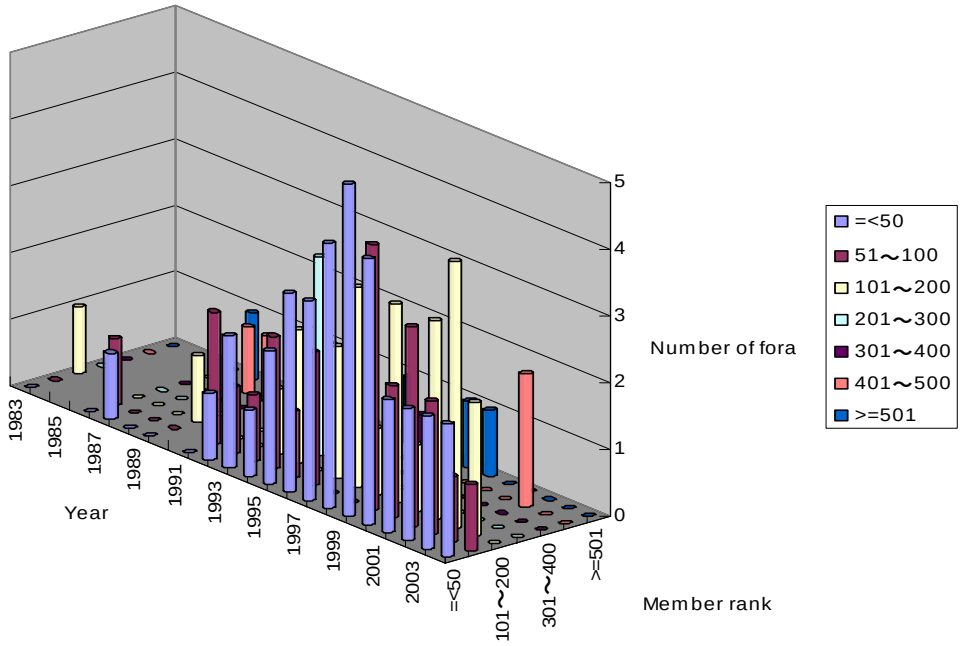

Figure 2.12 Number of members and time of establishment

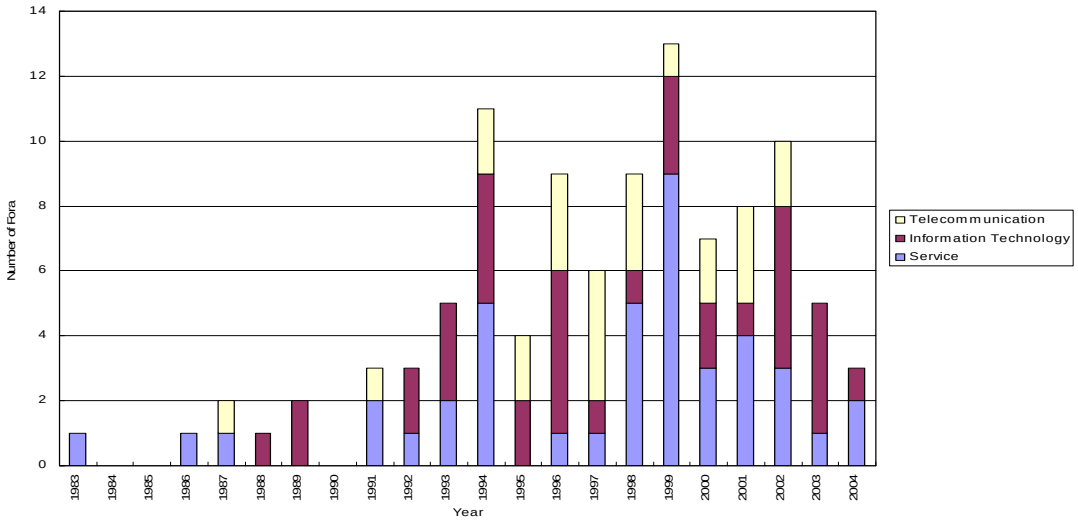

Figure 2.13 Time of establishment and number of fora

2.5 IPR policy and forum activity

Recently the importance of IPR (Intellectual Property Right) policy has increased, and the forum activity survey cannot be conducted without taking into account the IPRs. In the past forum activity surveys, IPR has been surveyed roughly but it has not been specifically summarized so far. In this report, some of the survey results are presented as a consideration material in order to find a trend of standardization activities.

2.5.1 IPR policy's adoption and forum activity

The main purpose of activities of fora or standardization bodies has been a making specifications and recommendations for a general common use. In previous surveys it appeared that IPR policy was not clearly stated in many fora. However, rising the importance of IPR recently, a tendency of clearly defined IPR policy in each of the fora' bylaws or other statements has been increased. Figure 2.14 shows a increment tendency of number over the last 3 years in which fora have stated IPR policy.

From Figure 2.14, the number of fora with clearly stipulated IPR policies has increased from 59% to 73% of all surveyed fora since 2002. This shows that the fora with unknown IPR provisions are declining.

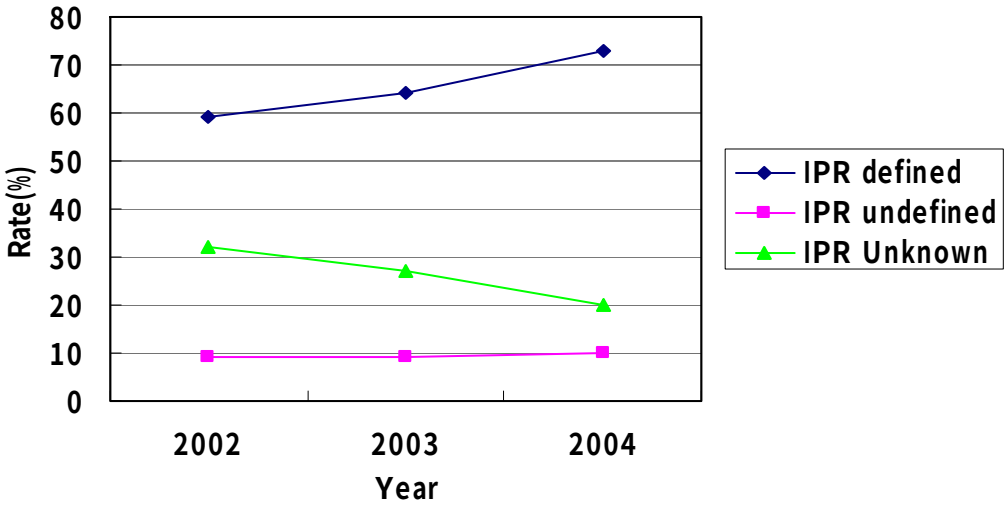

Figure 2.14 Transition of policy

2.5.2 IPR policy and objective fields

Figure 2.15 shows the ratio of fora specifying IPR policy under the object fields.
The followings are a summary of this figure:

(1)The number of fora with IPR policy defined is a fairly numerous 70% amongst fora in the telecommunication field where fora have a strong sense of sharing a unified interface. Although it is not shown here as a data, there is only one forum which does not open its specifications including IPR. Further, in looking at the contents of IPR provisions, there are mostly three types of choice stipulated as IPR policy by ITU-T, ANSI, IEEE or other standardization organizations: [1. No compensation consent (RF : Royalty Free), 2. Reasonable and non-discriminatory (RAND : Reasonable and Non-Discriminatory Conditions), 3. Other than 1, 2 above]

(2) Meanwhile, in the information technology field, the IPR influences competence of products in the market and the fora are requested to define the IPR policy, consequently, the ratio of the fora regulating IPR policy becomes fairly 84%, and conversely the one of the unknown fora is few of 8%.

(3) Also in the service field, the ratio of fora setting IPR policy is at less than 60%. This may be because there are many fora emphasizing activities promoting diffusion rather than setting IPR policy.

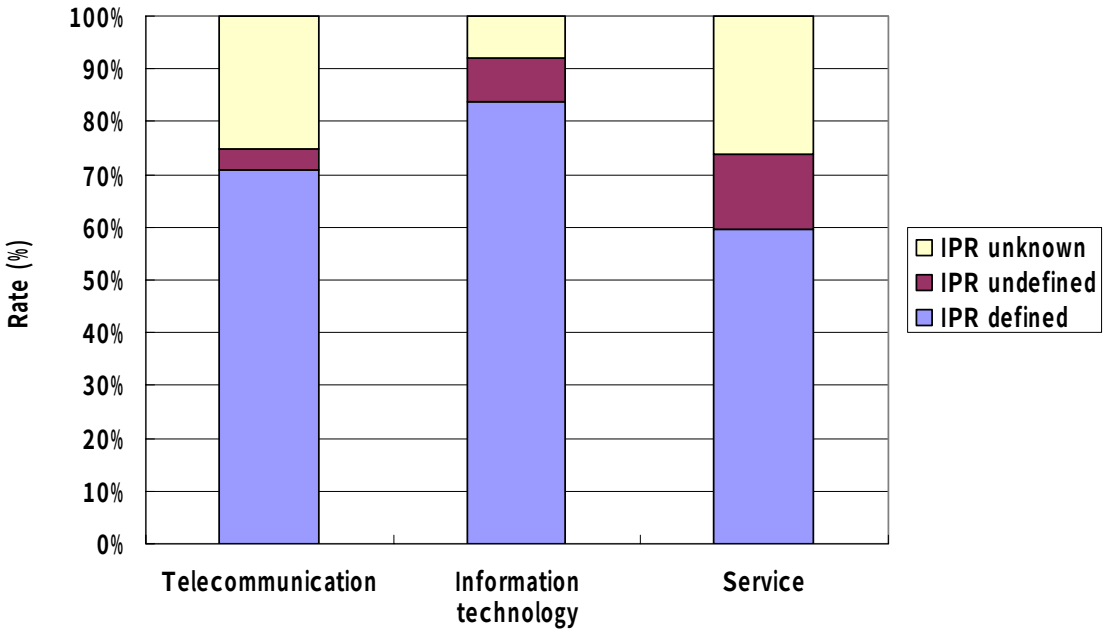

Figure 2.15 IPR policy ratio by fields

Figure 2.16 shows the IPR policy ratio of the fora in detail.
The followings can be derived from the figure:

(1) In contrast with subscriber systems, the ratio of the IPR policy setting in the telecommunication field and mobile communication systems, those which are infrastructure systems, are at the level of 60 to 70% at most. This may be because of the, fair connections among operating companies. Whereas, it can be seen that all subscriber systems fora offer a clear policy, perhaps because they will become the future market battleground.

(2) In the information technology field, fora imposing regulations have risen to the 90% level perhaps because they take a strict view of IPR.

(3) In the service field, the most of fora relating to multimedia and home networks define their IPR policies, since the former depends on technology strongly and the latter is based on consumer electronics. However for EC related and ITS related fora dealing with service itself, there are few fora setting IPR policy. This may be because it is difficult to acquire intellectual property rights or perhaps because there are a lot of fora whose objective are promotion.

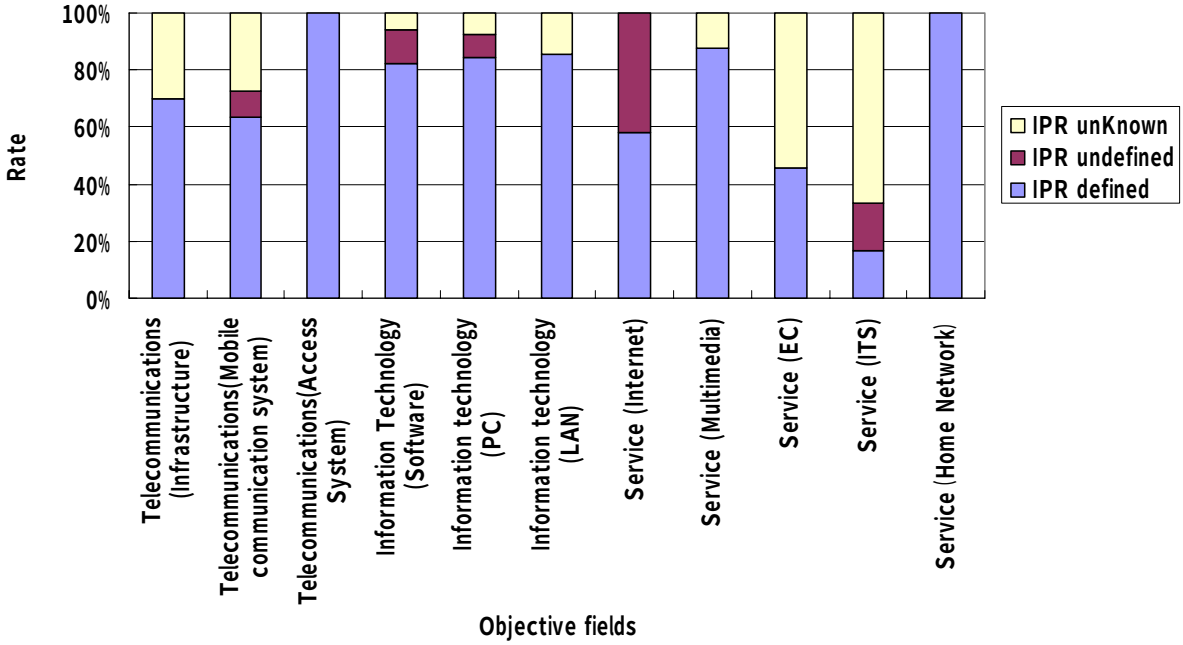

Figure 2.16 The presence of detailed IPR policy by fields

2.5.3 IPR policy and activity objectives

The relation between IPR policy and activity objectives normalized by each activity objective is shown in Figure 2.17 and specific forum abbreviations are shown in Table 2.15.

Table 2.15 The adoption of IPR policy and activity objectives

Activity objective	Adoption of IPR policy					
	IPR defined		IPR undefined		IPR unknown	
de facto standard	Bluetooth, BSF, Cable Modem/DOCSIS, DHF, ECHONET, GlobalPlatform, HomePNA, ISOC, OIF, OSGi, PCCA, PCISIG, PHS MoU, TOG, TVAnytime Forum, USBIF	16	Salutation	1	IIC	1
Pre-standard	EGA, FCIA, MBOA, OMG, POF, RPRA, TMForum, Web 3D, ZigBee	9		0	DECT Forum FSAN PCMCIA	3
Implementation specifications/ interoperability	1394TA, ADSL, ATMF, CELF, DLNA, DOPG, DSLF, EDIFICE, ELC, ENUM, FIPA, GGF, HAVi, IMTC, IrDA, IPCC, LONMARK, MCPC, MPLS&FR, MSF, NPF, OGC, OMA, OSDL, PICMG, SDR, T-E, UMTS, UOPF, UPnP, WS-I	31	ITS Forum, MBA, UbiqNet	3	EIDX, IDF, WiMAX, WiMedia	4
Others	AMIC, ASN.1, CDG, cIDf, ECOM, EMF, GSA, LAP, MEF, MOPASS, MPEGIF, OASIS, SCA, STA, W3C, WfMC, W-S	17	BSC, CTFJ, EJF, ICANN, JIF, WWRF	6	AIM, CommerceNet, EMA, ERTICO, GSM Association, IDB Forum, IPv6, ITS America, JICSAP, JIPPA, mITF, SAF	12

From this information the followings can be deduced:

(1) For fora generating de facto standards or implementation specifications/interoperability, setting IPR policy is important and their ratio reaches the 80 - 90% level.

(2)The fora with their objectives of producing pre-standardization are intent to provide standard specifications to upper level standardization bodies such as ITU-T, and IEEE. Then, in regards to IPR policy, there seems to be followed with the intention of upper level bodies ultimately, it seems to have a low ratio of clear regulation.

(3) Since their main objective of the fora in the field of “others” objective are to disseminate information, they do not need to set IPR policies and their ratio becomes 50% or below.

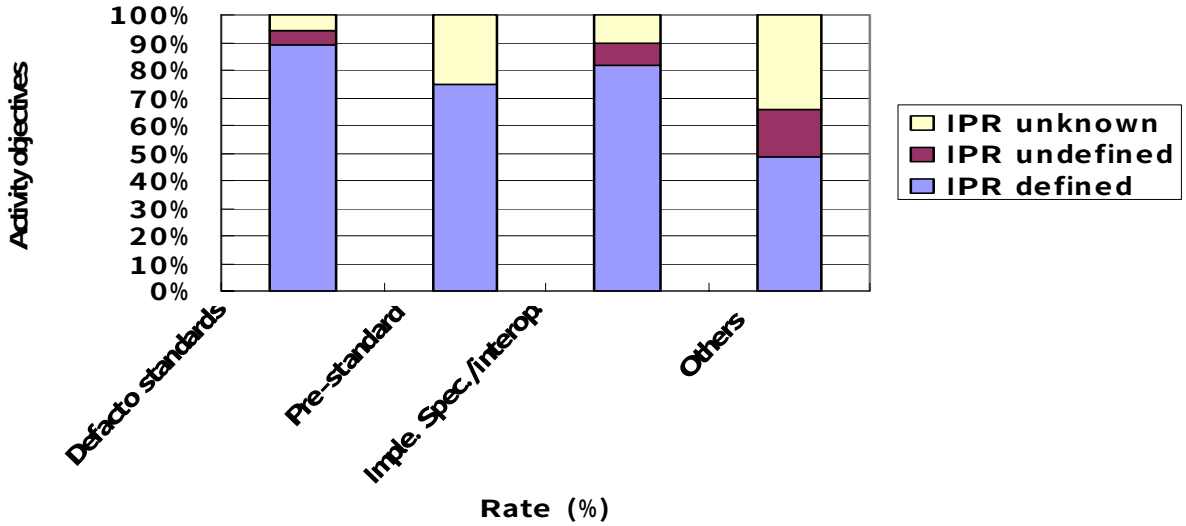

Figure 2.17 Adoption of IPR policy by activity objectives

Figure 2.18 shows the ratio of the objective fields under the purpose of activities, where the numbers are normalized by the total number of fora having IPR policies.

The following can be derived:

(1) In regards to de facto standard objectives, the ratios of the telecommunications, of the information technology and of the service are all most the same,

(2) In regards to pre-standards because there is no forum in the service field, there is no forum setting IPR policy,

(3) For the implementation specifications/interoperability objectives, for the fora of the telecommunications and of the information technology fields, there are a lot of fora setting IPR policy,

(4) In regards to “others” objectives, there are a lot of fora setting IPR policy in the service field.

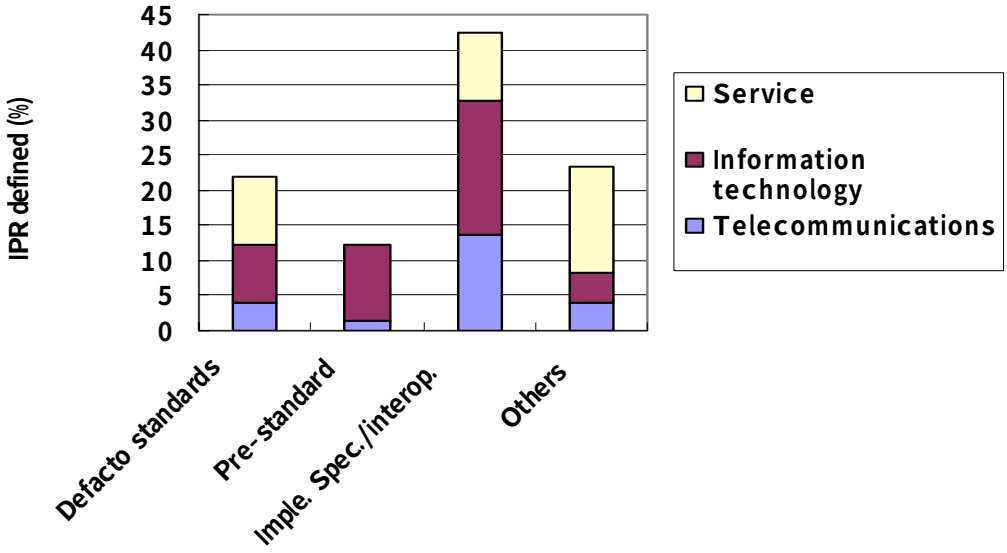

Figure 2.18 Ratio of fora with IPR policies by activity objectives

2.5.4 Conclusion

A quantitative analysis on the relationship between IPR policy and forum activity has been conducted. The followings are summary of the analysis:

(1) Recently the importance of IPR (Intellectual Property Right) policy has been realized, and a number of fora defining IPR policy has been increasing.

(2)In the telecommunications field, the number of fora setting IPR policy is around 70%, in the information technology field 84%, and in the service field less than 60%, those of the numbers indelicate its particular characteristics.

(3) For fora whose objectives are de facto standards or implementation specifications /interoperability, the ratio of setting IPR policy has reached the 80 - 90% level, but ones of the pre-standardization objectives seem to agree with the intention of upper level standard bodies such as ITU-T and IEEE, and the ratio that are clearly set is low. The main purpose of the “others” objective forum is to disseminate information, then, since they do not need to set IPR policies their ratio is 50% and below.

3. Topic – A study on VoIP standardization

This section focuses attention on Voice Over Internet Protocol (VoIP), which is one factor that will greatly change the future infrastructure of telecommunications, and considers forum activity in standardization and its relationship with ITU.

3.1 Introduction

The spread of VoIP in recent years is remarkable. The opportunities to use IP telephony utilizing VoIP have become very common in home and office. It appears that such a wide spread of IP telephony[1] was achieved by significant contributions both from de facto and de jure standardization occurring from the middle of the 1990s, and also from promotion and interworking verification activities that were done by industry fora. At the same time the period of the late 1990s was a period when standardization activity, in both de facto and de jure strands, was faced with various challenges. This was because the importance of Internet technology, which the Internet Engineering Task Force (IETF) provides the main leadership for standardization, was rapidly expanded. Internet came in the telecommunications technology area where up till then the ITU-T had taken responsibility for de jure standardization. It can be said that in passing through this period the foundations for standardization of the now present next generation network were built.
In this article in order to understand the process of standardizing VoIP, first the structure of VoIP is explained simply and then the related standardization bodies are introduced. After that a history of VoIP standardization is introduced and the relationship between various fora and ITU is studied.

3.2 An overview of VoIP standards

In order to help in understanding the standardization of VoIP, the basic structure of VoIP is described in this section.

For IP telephony to be widely deployed, the compatibility of technical standards for interoperability is very important. The technical field of VoIP can be broadly divided up into the codec, the signaling, and the IP network. VoIP is a system whereby an analogue voice signals are converted into digital and IP networks transmits the voice signals, and then at the receiving end restores the digital signals to analogue voice and thus carries out the transmission of real-time conversation. The process that takes place of converting to digital and restoring again is called codec. Within codec there are a number of internationally standardized systems and in VoIP too, according to the field of application, there are a number of international standards used for different purposes. Next, a process for VoIP corresponding to a call set up is needed in a telephone-switching network. This process is standardized as a signaling protocol. With the VoIP signaling protocol also multiple protocols are applied differently according to use. Finally, in order for the IP network to transmit various voice signals and multimedia information a common procedure is standardized.

Since the IP network was originally designed for the transmission of stored data, a basic procedure became necessary for real-time communication such as VoIP. The following sections some representative standards are described.

3.2.1 Standards relating to IP telephony CODECs

[1] There are a number of different names for VoIP such as IP telephony and Internet telephony. In this section the technology that is subject to standardization is called VoIP and the service or system using the technology is called IP telephony

There are many types of codec standards but in Japan the ones principally used are G.711, G729 and T.37/T.38 for FAX communication.

(1) G.711
ITU-T recommendation G.771 (Pulse Code Modulation (PCM) of voice frequencies) is a method of sending digitized voice information without compression. It can achieve a voice quality close to the existing telephone and so it is widely utilized for IP telephone services using broadband connection services such as ADSL.

(2) G.729
ITU-T recommendation G.729 is a method of transmitting only the characteristics of the waveforms and synthesizing the voice at the receiver's end. It makes VoIP possible over a much smaller transmission bandwidth. This is used generally for VoIP installations intended for use with lower-speed leased lines.

(3) T.37/T.38
Methods for transmitting FAX over IP networks are also standardized under ITU-T. ITU-T recommendation T.37 is called a store-and-forward type and is a method of forwarding Fax data temporarily stored on a server. On the other hand ITU-T recommendation T.38 is called real time FAX. This is a method for sending FAX in real time after setting up a call using VoIP signaling as with a conventional FAX. The expansion of method T.38 that interfaces with various types of VoIP signaling protocol introduced in the next section is being standardized by ITU-T.

3.2.2 Standardization relating to IP telephone signaling protocol

Signaling protocol is a procedure for connecting and disconnecting an IP telephone and is chiefly standardized by ITU-T or IETF[2]. In call control protocol there are ITU-T international recommendations H.323 and H.248 (megaco), MGCP used in the CATV industry, and SIP in the process of being standardized at IETF. Each is used for different purposes according to their development objective and application.

(1) H.323
H.323 was made an international recommendation by ITU-T in 1996 with the objective of making multimedia communication technology developed for digital exchange networks such as ISDN operate on a packet network. Thus it is a standard of architecture made up of multiple technical standards such as signaling protocols, voice or video codec, security, and additional services. Since a function corresponding to a telephone set called Simple Endpoint Terminal (SET) in the second edition of H.323 created in 1998 was standardized, it has been known as the basic technology of the IP telephone. The H.323 system is made up from the VoIP terminal called the H.323 Gateway (GW), and the VoIP server called the H.323 Gatekeeper (GK), and also conferencing equipment called MCU(Multipoint Control Unit). H.323 is the oldest IP phone standardized protocol and also at present the standardization of new features is being studied and there are many compatible VoIP products.

(2) SIP
SIP (Session Initiation Protocol) is one of multiple protocols that IETF mmusic (Multiparty Multimedia Session Control) WG developed, in order to communicate multimedia in real time such as multimedia conferences on the Internet or distance learning. It is a client /server type of process for starting or stopping sessions between applications. The first edition was published in 1999 as IETF RFC2543 but in the second SIP edition (RFC 3261) published in June of 2002 functions were added that were needed to make IP telephony

[2] The Internet Engineering Task Force (IETF)

practical and they came to be used as basic methods for VoIP.

(3) MGCP and softswitch

MGCP (Media Gateway Control Protocol) was publicly released as an industry standard in 1999 by ISC (International Softswitch Consortium), a consortium centering on North American vendors. MGCP was intended as a basic technology in VoIP control architecture called Softswitch. Softswitch is an architecture that divides the function of the conventional telephone exchange, disperse each functions trough the IP network, and forms a distributed application system using the whole network as a telephone exchange. It aims at a shortened construction time for a new IP telephony service deployment at a cost reduction by exchanging the existing expensive complicated system with general-purpose servers and simple gateway devices. MGCP is a master/slave protocol applied between a server called CA (Call Agent) and a VoIP terminal called MG (Media Gateway) that constitutes the softswitch. CA is master and putting MG under the control of an abstract connection model directs the movements to the slave MG.

(4) Megaco (H.248)

Megaco is a nickname for the protocol provided in 2000 jointly by IETF's media gateway controller (megaco) WG and ITU-T's SG16. Megaco is master/slave type of protocol applied to a softswitch in the same way as MGCP and the media gateway controller (MGC) equivalent to MGCP's call agent (CA) controls the media gateway (MG). The Megaco connection model makes possible a more flexible control than MGCP.

3.3 Main VoIP standardization bodies

The VoIP technologies mentioned in previous section are standardized mainly by ITU-T and IETF. In this section, ITU-T, IETF, and some other relating fora dealing with de facto standards, pre-standards, and implementation specifications are introduced. In this publication IETF is categorized as one part of the forum activity carried out by the ISOC (Internet Society). However IETF leads standardization of Internet technology and exercises a great influence internationally, thus this section mainly introduces IETF standardization activity.

(1) ITU-T

ITU-T (International Telecommunication Union Telecommunication Standardization Sector) has borne an important responsibility as the standardization body for telecommunication technology. ITU-T is one of the agencies of the United Nations with its headquarters in Geneva, Switzerland. It makes decisions on various kinds of international standards connected with telecommunications in the form of ITU-T recommendations and also manages the allotment of numbers connected with telecommunications to each country. This publication abbreviates a more detailed explanation but shortly, while decisions for ITU-T's international recommendations, mediating differences of opinion amongst the various connected countries, is fairly time consuming, once the decisions have been made they are used very widely internationally, and so it has a very strong influence.

(2) IETF

The protocol used for IP networks is standardized by IETF (Internet Engineering Task Force). IETF started as a technical working group that held its first meeting in 1986 for the study of a protocol for use on a network interconnecting computers to exchange information between the United States government research institute and universities. At the present IETF is an international organization contributing to the development of the Internet architecture and the Internet's smooth operation and 50% of its participants is non-American. There is no registered membership in IETF but network designers, operators, vendors, and academic researchers participate as voluntary individuals. In contrast to ITU-T where the consent of various regions of the world and a unified technical standard are emphasized,

IETF standardization policy is represented by their slogan of “Rough consensus and running code”. First after general agreement is gained a process is followed whereby operating software is trialed on the Internet, commented on and improved.
All IETF’s public notifications are called RFC (Request For Comment) and consecutive numbers are assigned. RFCs have the following types:

a)Standard track:
A document that stipulates protocol specifications that become IETF technical standards.

b)Best current practice:
A document that records a standardization procedure or management method for the IETF community.

c)Informational:
A general report submitted to the Internet community, without agreed content or recommendation. Contents cover a range from venders publishing technical information to condolences to the dead.

d)Experimental RFC:
Part of some research or development made into a specification, with the purpose of publication as general information or documentation for the record of some relevant achievement.

e)Historic RFC:
An RFC that has been revoked through revision or abolition.

From amongst these the one related to Internet technical standards is Standard Track RFC, and it is further divided into 3 types: Draft Standard, Proposed Standard: and Standard. These standard track RFCs following the IETF standardization process, go through the steps shown below to become the Internet standards.

a)Proposed standard:
In order to test interoperability of a new technology on the Internet, Proposed Standard is specified and is given a trial period. The profitability of the specification is proved and to some extent it is a reliable specification but it is found not to be apt for practical use and undesirable. Within 6 months to 2 years it must be investigated to see whether it should be raised to the next level, modified or abrogated.

b)Draft standard:
Cases where multiple, interoperable, independent implementations exist and the specifications have had their safety confirmed as apt for practical use, but where there are not yet many actual results of use. Within 4 months to 2 years they must be investigated to see whether they should be raised to the next level, modified or abrogated.

c)Standard:
Specifications with actual proof of its stability, and used for a long period by the Internet community. When the Standard specification is revised it is preserved as a historic RFC.

Also there is a document called an Internet-Draft (I-D) that is used for a limited period for study and discussion. Any one can put forward an I-D, but if it is not modified within a time limit of 6 months it is deleted.

(3) Other fora

From about 1998 forum activity for VoIP standardization became very active centering on American and European ISPs and telephony service providers.
The principal activity regarding VOIP were: TAC (Technical Advisory Committee) created by Level 3 Communications, a major ISP; ISC (International Softswitch Consortium now IPCC (International Packet Communications Consortium)) created around a study group of VoIP vendors; Bellcore (now Telcordia) to write standards to accommodate local telephone

companies' VoIP services; PacketCable that carries out standardization of two way multimedia communication at CableLabs centered on North, Central, and South American cable television operators. There were also TIPHON that is a research project for IP telephony that carried out research projects as a subordinate of ETSI (European Telecommunications Standards Institute), a European regional standardization body with close to de jure activity. These various connections will be considered in the following section.

3.4 An examination of history of VoIP and of relationships between the main organizations

This section divides the history of VoIP standardization into 3 periods. It introduces and compares the chief movements in each part of ITU-T, IETF and the de facto standardization bodies and through this process considers the state of standardization in each period.

3.4.1 The dawn of VoIP (approximately 1996-1999)

VoIP first became taken up as a theme of standardization in the mid 1990s. The first two big moves were a study of multimedia communication in LANs (Local Area Network) that ITU-T's SG16 (Study Group 16; Multimedia terminals, systems and applications) promoted, and multimedia conferencing over the Internet that the IETF's mmusic WG (Multiparty Multimedia Session Control working group) studied. As the name shows both bodies at first thought of making an application to video distribution or TV conferencing. However, in the later 1990s as these bodies in succession standardized signaling protocols such as H.323 and SIP (Session Initiation Protocol) and voice codec method G.711, they first drew attention as a basic implementation method for IP telephony. Applying these technologies, VoIP equipments for enterprises or campuses were implemented. It was at this time that introduction of IP telephones began between some advanced users.

The earliest standardized technology was ITU-T's H.323, with the first version in 1996 and the second version being put out in 1998. H.323 is a technical standard set to structure a multimedia communication system on a packet network. It defines the H.323 system composed of an H.323 terminal, gateway, gatekeeper, and MCU (Multipoint Control Unit, a device for controlling communication between multiple points), and regulates the architecture that includes protocol necessary for system structure and the systems for interconnection with networks other than H.323. H.323 basic procedures are an application of ISDN (Integrated Services Digital Network) technology. It originally had close affinity with existing telephone switching technology and so was a technology suitable for IP telephony. In particular, in the 1998 second edition an opportunity occurred when standards limited to the function corresponding to the existing telephone device called SET (Simple Endpoint Terminal) were made into a recommendation as Annex and H.323 was established as the basic technology for VoIP and transition to practical use commenced.

So although at ITU-T the standardization of technology to produce IP telephony was clearly placed as a scope, at IETF the point of great discussion was a more basic internet feature; how to define the common technology to carry out real-time multimedia communication on Internet that is originally designed for non-real-time data transmission. That is to say that on an IP network designed to acquire information previously stored on a server such as files transfers, WEB page access, and E-mail, there was no procedure to carry out the communication of real time multimedia. In real time multimedia such as TV conferencing or IP telephony there is a sender and receiver transmitting and receiving information at the same time and yet where if there is significant delay or the loss of data, transmission cannot take place. Real time multimedia communication in IP networks was a great challenge changing the basics of the Internet. In order to implement this at mmusic WG, first RTSP

(Real Time Streaming Protocol) was set up as a technology to carry out real time communication on IP networks. At the same time, “session” was defined as the basic concept of a set up end to end so that sender and receiver could communicate at the same time. This can be thought of as a concept close to a “call” in a telephone network but the area of application is not only IP telephony as it can be used for all real time communications. Also, originally the content of communication on the Internet was only data. However as there was a need to respond to various types of media in real time such as images and voice, SDP (Session Description Protocol) was set up and it became possible to choose media for use. SIP (Session Initiation Protocol) that is presently the subject of interest as a VoIP technology is a protocol for opening and closing the above mentioned session and in this period was published in 1999 in its first edition (RFC2543).

It can be seen from this that in this period the directions considered by ITU-T and IETF were different. ITU-T set its sights on a concrete IP telephony service requiring various participating countries. The technological standardization went forward with all the architecture unified including ISDN, PSTN and other different services as an extension of existing telecommunication services. However IETF’s basic concept was that the Internet is an infrastructure provided to the public and that the purposes of use were free to be decided by the users. It took the view that IETF was only to provide the basic technology to enhance freedom of use. For this reason IETF did not define system architecture like H.323, and protocols such as RTSP, SDP, SIP and others did not assume the IP telephone service but intended them to be capable of use generally for various purposes.

Another big difference is that once ITU-T makes a recommendation a useable technology is established but IETF’s RFC starts from assessment as a prototype. SIP edition 1 (RFC2543) published in 1999 was a Proposed Standard to study interoperability on the Internet and was not at the stage where VoIP equipment vendors or service providers could use it to make practical IP telephony systems. Accordingly, at the time when SIP RFC2543 was published some universities supporting IETF activities carrying out prototype evaluations of distance learning and video conferencing dealt it with but full implementation was not carried out. At this time H.323 was the main technology for practical VoIP deployment.

3.4.2 VoIP by service providers (1998-2001)

From the late 1990s when H.323 was spreading to about 2000 telecommunications enterprises, Internet service providers (ISP), and Cable Television (CATV) companies began to study providing IP telephone services. In the early period H.323 was seen as being a technology for use on local networks and technical study was needed for service providers to use it over the wider areas. Representative examples are ISC (International Softswitch Consortium (now IPCC)), MSF (Multi-service Switching Forum) and Cable Labs’ Cable Modem/DOCSIS Packet Cable.

Originally these fora activity had their origin when from about 1998 European and American ISP or telephone enterprises had the object of providing a dial up ISP connection or an IP telephone service. They advocated setting up architecture to standardize a supply specification for a gateway device making interconnection between existing circuit switching networks and IP packet networks. There are two big movements in North America. One is activity taking place in TAC (Technical Advisory Committee) created when Level 3 Communications which is a large ISP, gathered vendors’ technicians to study specifications to supply equipment. Another was Bellcore (now Telcordia) that was set up as a joint research center for regional telephone companies when the regional telephone companies were established after AT&T was split up. Bellcore settled on specifications for supplying common devices to the regional telephone companies. Both together were attempting the standardization of a protocol for controlling VoIP devices with virtually the

same purpose and function and so in 1998 they both cooperated and agreed to standardization as a single specification called MGCP (Media Gateway Control Protocol).

MGCP standardization was performed at ISC (International Softswitch Consortium (now IPCC (International Packet Communications Consortium))). When ISP and telecommunication service providers offered VoIP services MGCP came to be widely considered as the basic architecture. Also PacketCable was started up in order to carry out the standardization of interactive multimedia communications over CATV as a subordinate of CableLabs. CableLabs is a de facto forum participated in by North, Central, and South American cable television enterprises. PacketCable's adoption of MGCP as the industry leader is progressing in such areas as using MGCP in IP telephone call control.

Parallel with this in 1999 MGCP was proposed to IETF and ITU-T. There was other similar but different proposals such as from ETSI (European Telecommunications Standards Institute), and IETF and ITU-T decided to merge these proposals to standardize as megaco (Media Gateway Control). Megaco is a flagship project being the accomplishment of the publication of a standard with exactly the same content by two bodies ITU-T and IETF as a result of their group work. At ITU-T in spring of 2000 it was made into ITU-T Recommendation H.248, and at IETF in November 2000 a specification with the same content was published as RFC 3015. That time was one of epoch making development for the industry as a relationship was structured through trial and error in the industry between de facto Internet technology and de jure telecommunications standardization.

While on the one hand it was a great step for standardization of both de facto and de jure, on the other it represented a contradiction from the quick implementations made possible by forum activity. For example MGCP and megaco are incompatible, but at the time that megaco was standardized in 2000 MGCP products were mainstream. For this reason there was the feeling that for megaco after several years passing and coming up to date at last they entered the stage of practical use. One reason may be that whereas MGCP urged on by the latest requests from ISP or CATV operators business, made urgent implementations with the chief forum leadership, megaco standardization under ITU-T took into account use by the whole world community.

Meanwhile forum activity is pausing and changing form. ISC, which standardized MGCP, from 2003 changed its name to IPCC (International Packet Communications Consortium) and shifted to promotion of a new service and educational campaigns on IP networks and its role as a de facto standardization body is weakening. In contrast, in the standardization the center of VoIP technology has moved to SIP, and IETF is becoming the place for the main de facto standardization activity.

3.4.3 The emergence of SIP and the positioning of IETF (2001-2005)

SIP, in its second version (RFC3261 to RFC3265) published in 2002, was altered by adding functions such as security provisions, modification of routing procedures, and call identifier and it has come to be used as the basic IP telephone protocol. Also the world's telecommunications operators in succession are clearly making a shift from circuit switching to IP networks and there is a big increase in the level of attention in the new SIP and IPv6 technology that IEFT is standardizing. According to the IETF home page, in 1996, the year that Internet diffusion just started, there was an attendance of about 1200 at the IETF conference, but by 2001 this had doubled.

At that time IETF divided its field of investigation into 7 to 8 areas. Each had a leader called an area director who carried out an assessment of the development of technical standardization and working groups (WG). In IETF there are more than 120 working groups doing research at once, and every month several hundred Internet drafts or RFCs

are published. Also the subjects being studied are very wide-ranging and taking only working-groups related to SIP or VoIP there have been numerous setups such as mmusic, avt, sip, sipping, simple, xcon, geopriv, enum, sigtran, and many others. A lot of attention is being paid to IETF with more people taking part in the discussions, and as the questions studied broaden the skills required of an area director and the responsibilities have become very great. Because of this, with the basic idea of “Rough consensus and running code” IETF carries out a very rapid standardization, but the delay in publishing RFCs has begun to stand out. In contrast, ITU-T prepared for standardization in the Internet age, promoted innovations such as the ability to carry out publication of standards based on the assessment of study groups in the short term when they had originally required a 4 year cycle, and prepared for a system making possible speedy standardization.

In order to improve this situation IETF gained the cooperation of ISOC in 2004 and carried out a change in the system of management in order to speed up the process of standardization. It is planned to finish this new system in 2005 and start operations. Even looking at SIP standardization in 2004 compared with the previous years the time taken by the work groups operations and RFC publication is getting shorter. There is a future trend for activity to be stabilized.

3.5 Conclusion

As shown above, at the present time in order to accomplish the specific purpose of defining the future of telecommunications, ITU-T is mainly carrying out activity around the central point of defining an over all architecture such as Next Generation Network (NGN). On the other hand IETF has begun to make clear its intention of concentrating on standardization of basic functions as a foundation for the Internet to be jointly used by various applications.

Also in other forum activity such as diffusion and promotion activity and interoperability tests is being carried out. In this way ITU-T, IETF and forum activity complement each other and it is thought that VoIP and NGN standardization are going ahead.

3.6 Reference

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4. Conclusion

The result of this year's survey of forum activities was as follows: covered fora, 103; of these 9 newly covered fora; fora with activities discontinued or terminated through acquisition, 6.

As an example of the new analysis carried out this year in section 2, in relation to the time of forum establishment, you can read about changes of the trends in establishing fora limited to the ICT field that faithfully reflects industry needs of each period. Put in a different way the importance of a forum's presence changes even in the short term with an early period purpose of creating de facto standards changing to a later period purpose of implementation standards or interoperability.

This year analysis of intellectual property rights has been done for the first time. With standardization activities being promoted by business enterprises there is an inseparable link to intellectual property rights and there also appears to be a tendency for enterprises in a pro-patent age, when fora of a similar type exist, to select (chose) fora emphasizing this point. We hope to strengthen analysis of this connection further in the future.

What did you think of the special VoIP feature in section 3. IPv6 is a related topic, but there is also a flood of many fora carrying out activities with their own objectives. In relation to IP, IETF and similar fora were formerly the main players but recently de jure related international standardization bodies have also become active in standardization activities. There are many areas attracting interest such as the relationship between fora and the connection between fora and de jure international standardization bodies. There is also an inexhaustible interest in the field of standardization from communication terminals to infrastructure; and also in a mixture of infrastructure for fixed or mobile networks and packet networks and various kinds of network operators; and in terminals which include digital consumer electronics, the international circulation of communication terminals and the peculiar statelessness of the internet.

This report also appears on TTC's home page (http://www.ttc.or.jp/e/index.html).
Chances are also increasing for the contents of this report to be quoted in various places apart from TTC and it has just recently been appearing in academic books. A specific example is IT Industry Wide Standards by Masami KAJIURA published by Bunshindo. For us as creators of the report this is sure proof that our achievement is recognized as having value to a third party. In the future we intend to enrich the contents further while encouraging frank opinions from all including those who have assessed this report apart from TTC. (Mail address for sending comments: E-mail: otoiawase@ttc.or.jp)

Last but not the least, we express our sincere thanks to those who provided us with valuable information and materials to successfully complete this survey.
