Chapter – 2:

International SSOs and their Patent Policies

2.0 Introduction

This chapter provides an introduction to the international (ITU, ISO, and IEC) and some regional SSOs (IEEE, ETSI, ANSI, IETF, NFC, JEDEC, and OASIS) This section particularly focuses on the legal basis for setting-up these standards and the decision making approach adapted by these SSOs, member representation and their voting powers. Also, the study focuses on the biding nature of such decisions, the legal implications of non-compliance, and enforcement mechanisms of such decisions. Further, a comparison of the patent policies of these SSOs is provided in terms of the timing of disclosure, level of disclosure, and the licensing principles. Standards Development Organizations are the entities that develop, coordinate, promulgate, revise, amend, reissue, interpret, or otherwise maintain standards that address the interests of users outside the SDO.

2.1 International SSOs In ICT Sector

(i) Early standards organizations

The Engineering Standards Committee[1] was established in London in 1901 as the world's first national standards body. It subsequently extended its standardization work and became the British Engineering Standards Association in 1918, adopting the name British Standards Institution in 1931 after receiving its Royal Charter in 1929. The national standards were adopted universally throughout the country, and enabled the markets to act more rationally and efficiently, with an increased level of cooperation.

After the First World War, similar national bodies were established in other countries. The Deutsches Institut für Normung was set up in Germany in 1917,

1 "BSI Group Annual Report and Financial Statements 2010, available at http://www.bsigroup.com/Documents/about-bsi/financial-performance/2010/bsi-financial-performance-2010.pdf, last visited on April 19, 2016.

followed by its counterparts, the American National Standard Institute and the French Commission Permanente de Standardization, both in 1918 [2].

(ii) International SSOs - History

R. E. B. Crompton drew up the first international standards body, the International Electrotechnical Commission, in 1906. By the mid to late 19th century, efforts were being made to standardize electrical measurement. An important figure was R. E. B. Crompton, who became concerned by the large range of different standards and systems used by electrical engineering companies and scientists in the early 20th century. Many companies had entered the market in the 1890s and all chose their own settings for voltage, frequency, current and even the symbols used on circuit diagrams. Adjacent buildings would have totally incompatible electrical systems simply because they had been fitted out by different companies. Crompton could see the lack of efficiency in this system and began to consider proposals for an international standard for electric engineering.[3]

In 1904, Crompton represented Britain at the Louisiana Purchase Exposition in St. Louis, Missouri, as part of a delegation by the Institute of Electrical Engineers. He presented a paper on standardisation, which was so well received that he was asked to look into the formation of a commission to oversee the process.[4] By 1906 his work was complete and he drew up a permanent constitution for the first international standards organization, the International Electrotechnical Commission (IEC).[5] The body held its first meeting that year in London, with representatives from 14 countries. In honor of his

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2 Wang Ping (April 2011), *A Brief History of Standards and Standardization Organizations: A Chinese Perspective* (PDF), East–West Center

3 *Colonel Crompton*, IEC Website

4 Johnson, J. & Randell, W. (1948) *Colonel Crompton and the Evolution of the Electrical Industry*, Longman Green

5 Chris K. Dyer, Patrick T. Moseley, Zempachi Ogumi, David A. J. Rand, Bruno Scrosati Newnes (2010). *Encyclopedia of Electrochemical Power Sources*. p. 540.

contribution to electrical standardization, Lord Kelvin was elected as the body's first President.[6]

The International Federation of the National Standardizing Associations (ISA) was founded in 1926 with a broader remit to enhance international cooperation for all technical standards and specifications. The body was suspended in 1942 during World War II. After the war, ISA was approached by the recently formed United Nations Standards Coordinating Committee (UNSCC) with a proposal to form a new global standards body. In October 1946, ISA and UNSCC delegates from 25 countries met in London and agreed to join forces to create the new International Organization for Standardization (ISO); the new organization officially began operations in February 1947.[7]

As mentioned above, Standards organizations can be classified by their role, position, and the extent of their influence on the local, national, regional, and global standardization arena. By geographic designation, there are international, regional, and national standards bodies (the latter often referred to as NSBs). By technology or industry designation, there are standards developing organizations (SDOs) and also standards setting organizations (SSOs) also known as consortia. Standards organizations may be governmental, quasi-governmental or non-governmental entities. Quasi- and non-governmental standards organizations are often non-profit organizations.

Broadly, an international standards organization develops international standards. (This does not necessarily restrict the use of other published standards internationally.) There are many international standards organizations. The three largest and most well-established such organizations are the International Organization for Standardization (ISO), the International Electrotechnical Commission (IEC), and the International Telecommunication

6 IEC. "1906 Preliminary Meeting Report, pp 46-48" (PDF). *The minutes from our first meeting.*

7 *Friendship among equals - Recollections from ISO's first fifty years* (PDF), International Organization for Standardization, 1997, pp. 15–18, ISBN 92-67-10260-5.

Union (ITU), which have each existed for more than 50 years (founded in 1947, 1906, and 1865, respectively) and are all based in Geneva, Switzerland. They have established tens of thousands of standards covering almost every conceivable topic. Many of these are then adopted worldwide replacing various incompatible "homegrown" standards. Many of these standards are naturally evolved from those designed in-house within an industry, or by a particular country, while others have been built from scratch by groups of experts who sit on various technical committees (TCs). These three organizations together comprise the World Standards Cooperation (WSC) alliance.

2,2. ISO, IEC and ITU

The **International Organization for Standardization** (ISO), **International Electro-technical Commission** (IEC), and **International Telecommunication Union** (ITU) (sometimes referred to for convenience as the 'Big Is'), are each, large, formally recognized standards setting organizations, and each has a worldwide focus. They were founded in 1947, 1865 and 1906, respectively. Formal membership in each organization is at the national level by the private or public sector entity that is globally recognized as a nation's authoritative standards representative, although often participation is wider and can include companies and individuals. The ITU is distinguished by the fact that it is a treaty organization formed under the aegis of the United Nations. ISO is a voluntary, non-treaty federation standards setting body founded in 1946-47 in Geneva as a UN agency. The IEC and ISO are both independent, non-governmental, not-for-profit organizations that develop and publish fully consensus-based International Standards.

The ITU is a treaty-based organization established as a permanent agency of the United Nations, in which governments are the primary members, although other organizations (such as non-governmental organizations and individual companies) can also hold a form of direct membership status in the ITU as well. Another example of a treaty-based international standards organization with government membership is the Codex Alimentarius

Commission. In addition to these, a large variety of independent international standards organizations such as the ASME, the ASTM International, the IEEE, the Internet Engineering Task Force (IETF), SAE International, TAPPI, the World Wide Web Consortium (W3C), and the Universal Postal Union (UPU) develop and publish standards for a variety of international uses. In many such cases, these international standards organizations are not based on the principle of one member per country. Rather, membership in such organizations is open to those interested in joining and willing to agree to the organization's by-laws – having either organizational/corporate or individual technical experts as members.

The International Electrotechnical Commission ("IEC") is an organization which was formed as a result of the Resolution of the Chamber of Government Delegates at the International Electrical Congress of St. Louis (U.S.A.), in September 1904. The organization is constituted as a corporate association with legal entity in accordance with Articles 60 et seq. of the Swiss Civil Code.

ISO is composed of the national standards bodies (NSBs), one per member economy. The IEC is similarly composed of national committees, one per member economy. In some cases, the national committee to the IEC of an economy may also be the ISO member from that country or economy. ISO and IEC are private international organizations that are not established by any international treaty. Their members may be non-governmental organizations or governmental agencies, as selected by ISO and IEC (which are privately established organizations). ISO covers a very wide number of technical areas, historically excluding the field of electrotechnology, which was primarily addressed by the IEC. However, when each organization became interested in emerging computer technologies, the potential for competition was resolved by forming Joint Technical Committee One (JTC 1), within which both organizations could collaborate in these domains. Standards development is undertaken through extensive cooperation with national standards bodies, which carry out the national approval stage procedure for ISO and IEC standards, among other tasks. ITU has – at least up to now – focused only on telecommunications; it

develops standards but also performs other important tasks, including in the area of radio spectrum allocation. While each of these organizations previously maintained its own IPR policy, they together adopted a common, albeit brief, patent policy in 2007, as well as a set of related Guidelines. This resulted in a shared and harmonized set of rules.

However, the joint policy is not intended to preempt the topic of IPR entirely: text can be found at the end of the Guidelines that grants each SSO permission to include organization-specific material. ITU, for instance, added an additional element to its policy for early disclosure and licensing commitments for a party's own contributions[8]. IPR-related rulings can also be made outside the Common Policy and Guidelines, and the ITU has issued Software Copyright Guidelines, and Guidelines on the inclusion of Trade Marks, whereas ISO and IEC do not. Furthermore, the actual procedures and the published IPR databases of each organization are notably different.

2.2.1. Legal basis for setting-up of ITU, ISO and IEC

(i) ITU

A framework agreement was signed jointly by 20 countries at the International Telegraph Conventions to form a Union and establish a common rules and standard equipment for transmitting telegraph messages across international lines. The International Telegraph Union was launched to provide a forum to turn the agreement into a living framework through the evolution of international communications technologies, facilitating dialogues and enabling amendments to the initial agreement.[9]

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8 General Patent Statement and Licensing Declaration for ITU-T or ITU-R Recommendation, available at http://www.itu.int/oth/T0404000003/en, last visited on April 18, 2016.

9 Jens Henricher, Savage, The Politics of International Telecommunications Regulation, Boulder 1989, 231 et seq., available at http://www.zaoerv.de/64_2004/64_2004_2_b_489_502.pdf, last visited at April 18, 2016.

The Telegraph Union merged the 1865 International Telegraph Convention and the 1906 International Radiotelegraph Convention into one agreement called the International Telecommunications Conventions in 1932. In 1934 it was renamed as International Telecommunications Union (ITU) which assumed the responsibility of promoting and standardizing all international communications.

The Additional Plenipotentiary Conference, which took place in Geneva, the ITU went through a dramatic remodeling to provide greater flexibility to adapt to today's increasingly complex, interactive and competitive environment. A change that was called for by experts and academics for years.[10]The resultant of the reorganization was that the Union was streamlined into three Sectors corresponding to its three main areas of activity – Telecommunications Standardization (ITU-T), Radiocommunication (ITU-R) and Telecommunication Development (ITU-D).

(ii) ISO

The organization which is known as ISO started in 1926 as the International Federation of the National Standardizing Associations (ISA) which focused heavily on mechanical engineering. It was disbanded in 1942 during the second World War but was re-organized under the current name, ISO, in 1946.

Even the name of the organization is standardized. The name, "ISO" is not an acronym but was derived from the Greek word "isos" meaning "equal". (The relation to standards is that if two objects meet the same standard, they should be equal.) This name eliminates any confusion that could result from the translation of "International Organization For Standardization" into different languages which would lead to different acronyms. ISO is a voluntary organization whose members are recognized standard authorities, each one representing one country. The bulk of the work of ISO is done by the 2700

10 "International Telecommunications Union (ITU)." Gale Encyclopedia of E-Commerce. 2002. *Encyclopedia.com.* http://www.encyclopedia.com, last visited on April 18, 2016.

technical committees, subcommittees and working groups. Each committee and subcommittee is headed by a Secretariat from one of the member organizations.[11].

(iii) IEC

IEC (International Electrotechnical Commission) was founded in 1906, IEC is the world's leading organization for the preparation and publication of International Standards for all electrical, electronic and related technologies collectively known as "electrotechnology". IEC is an International nongovernmental organization which is headquartered in Geneva, which has 162 countries – 81 members and 81 affiliates that are representative of all developed economies and a large majority of developing nation

2.2.2. Decision Making

(i). Approach

Procedures and approach adopted by international standard-setting organizations for a work at technical level on the formulation of standards show marked variations. Each organization's procedure is greatly influenced by the practices followed by it in the past and by the framework adopted by it for decision-making on administrative and technical matters. In case of international standard setting bodies belonging to United Nations, the procedures used for the work in standardization field are further influenced by the practices they follow for work in other areas as well. Though the procedures and approach adopted by these organizations vary widely at the detail level, there are a few principles and elements that are common which are described below:

The relevant body takes the decision to commence the work of a new standard within the organization that is responsible for making such decisions which may be at the request of a member or a group of members or on an initiative taken by the secretariat of the organization. After the decision is taken,

11 http://www.sis.pitt.edu/mbsclass/standards/martincic/isohistr.htm latest visited 10 April, 2016

the definition and technical scope of the standard are agreed upon and the responsibility of 'negotiating technical specifications' and 'for consensus building' on the draft standard is assigned:

- In case of ISO and IEC to technical committees and sub-committees
- In case of ITU, to study groups
- Draft standard prepared during the discussions and negotiations at expert level is circulated by the secretariat to all the members for comments and views.
- The comments received from members are passed on to the relevant committees or commissions for their review and examination.
- The final draft is prepared and finalized by the committees or commissions, after taking into account all the comments received from the members. The draft is then transmitted to the members of the organization for adoption as an international standard.

It is important to note that there are considerable differences among 12 organizations in the way in which the technical work on the formulation of standards is undertaken by the technical committees and its commissions. The procedures for decision making to adopt international standards based on the draft standards developed in the work at technical level differ among the international standard-setting bodies. Generally, as a principle, the procedures provide for adoption by ***consensus***.

ISO and IEC as part of their rules do not transmit the draft standards to the full members unless there is consensus among the countries participating in the work at technical level. Further to the consensus a formal vote is required for the draft standards to be adopted as international standards. The criteria for adoption requires approval by two-thirds of the ISO members that have participated actively in the standard development process and approval by 75 per cent of the members that vote.

(ii) Member representation and voting powers

Organizations having only one class of membership

The members of the UN family of organizations which are intergovernmental and that are engaged in standardization work – ITU, CAC, and IPPC have the same status. All the members have a right to participate in all aspects of the ongoing work along with a right to vote. Other organizations have different classes of membership to facilitate and participate in the development of the developing countries in their work.

Organizations having different classes of membership & technology areas of focus

ISO has, three classes of membership - (a) Member bodies can participate in all activities of the organization and have the right to vote; (b). Correspondent members can attend meetings as observers but do not have the right to vote; these members are also not eligible to participate actively in the work of technical committees; and (c) Subscriber members are entitled to get ISO bulletins and other publications but do not have the right to participate in the meetings or technical committees.

IEC membership almost follows that of ISO – (a) Members can participate in all activities of its work and have the right to vote; (b) associate members can attend meetings as observers but do not have the right to vote and cannot actively participate in the work of the technical committees. IEC has recently adopted the "Affiliate Country Programme" to create greater awareness of its work in the developing countries that are not its members and to assist them in establishing "national committees' that can participate in its work when they become members. Likewise, OIML also has member States and corresponding members wherein, corresponding members can attend the meetings as observers but cannot vote.

Almost all members in the correspondent, associate, or subscriber classes are developing countries. In ISO 35/37 correspondent members are from developing countries. These class of membership has been established by the

organization to create awareness of the importance of their work among countries that are not in a position to become full members and to prepare them gradually for full membership by familiarizing them with the work. By creating these classes of membership, the membership fees are kept low compared to that for a full membership. Table- 1 depicts the different class of members and their rights:

ISO	IEC	ITU
A. Areas of standardization		
All products and systems that are not dealt with by IEC and ITU	Electrotechnical standards	Telecommunications
B. Formation of the organizations and legal status		
Non-governmental organization	Non-governmental organization	United Nations specialized agency
C. Who can become members		
National standards bodies	National committees consisting, inter alia, of government agencies and manufacturer	Governments and scientific or industrial associations
D. Members: Classes and their rights		
93 member bodies, with the right to participate in all activities and to vote. 36 correspondent members who can attend as observers but have no right to participate in the work of technical committees and to vote. 14 subscriber members who receive ISO bulletins and other publications	52 full members with the right to participate actively and to vote 11 associate members who can participate as observers but have no right to vote	189 member governments 670 sector members and associates (Associates have limited rights of collaboration within the study groups and meetings. Sector members have access to various meetings and to publications, documents, information and statistics

TABLE-1: MEMBERSHIP OF AND VOTING RIGHTS OF ITU-ISO-IEC

ITU Voting process:

Quorum[12]:

A valid decision that is to be taken at a plenary meeting, more than half of the delegations accredited to the conference and having the right to vote must be

12 Collection of the basic texts of the International Telecommunication Union adopted by the Plenipotentiary Conference, 2011 Edition, available at http://www.itu.int/dms_pub/itu-s/oth/02/09/s02090000115201pdfe.pdf , last visited on April 18, 2016.-

present or represented at the meeting. This provision applies without prejudice to any provision in the Constitution or the Convention requiring a special majority for the adoption of any amendment thereto. Abstentions of more than fifty per cent: In the event of abstentions exceeds half the number of votes cast which is for, against or abstentions, the matter under consideration for discussion will be postponed to a later meeting at which the abstentions is not taken into account.

Special majority: In cases that is concerning to the admission of a new Member State, the majority described in Article 2 of the Constitution shall apply.

Definition of a majority – ITU

1) A majority shall consist of more than half the delegations present and voting

2) In computing a majority, delegations abstaining shall not be taken into account

3) In case of a tie, a proposal or amendment shall be considered rejected

4) A "delegation present and voting" shall be delegation voting for or against a proposal

Non Participation in voting:

Delegations present but which are not taking part in a particular vote or expressly states that they do not wish to take part will not be considered as absent for the purpose of determination of a quorum.

Right to Vote:

At all the meetings of a conference, assembly or other meetings the delegation of a Member State is duly accredited by that Member State to take part in the work of the conference, assembly or other meeting shall be entitled to one vote in accordance with Article 3 of the Constitution. The delegation of a Member State shall exercise the right to vote under the conditions described in Article 31 of the Convention. When a Member State is not represented by an administration at any of the three vectors the representatives of the recognized

operating agencies of the Member State concerned shall, as a whole and regardless of their number, be entitled to a single vote and the provisions of Nos. 335 and 338 of the Convention concerning the transfer of powers shall apply to the above conferences and assemblies mentioned. While the voting takes place in the form of one state-one vote, amendments to the Constitution requires a two-thirds majority and amendments to the Convention requires a majority of at least half of the delegates at a Plenipotentiary Conference.

ISO and IEC voting process[13]:

The IEC and ISO are both independent, non-governmental, not-for-profit organizations that develop and publish fully consensus-based International Standards. The members of the both the organizations include government, private and public-private entities. Both organization, have the membership on the principle of one member per UN-recognized country and every member country, no matter how large or small, has one vote and a say in what goes into the IEC or ISO International Standard. National positions on IEC and ISO International Standards are not necessarily government positions, but should be representative of all interested stakeholders, including government experts of that nation. The IEC and ISO promote world trade and economic growth and encourage the development of products, systems and services that are safe, efficient and environmentally friendly. Each member body that has an interest in the work of a committee is entitled to be a member of that committee. Standards are reached by consensus with each member organization that is representing the interests of the vendors, manufacturers, consumers, professionals, and government of its country.

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13 ISO_IEC_Directives_Part_1_and_Consolidated_ISO_Supplement_-_2015_(6th_edition), available at http://isotc.iso.org/livelink/livelink/fetch/2000/2122/4230450/4230452/ISO_IEC_Directives_Part_1_and_Consolidated_ISO_Supplement_-_2015_(6th_edition)_-_PDF.pdf?nodeid=17159827&vernum=-2, last visited on April 18, 2016.

"***Consensus***: General agreement, characterized by the absence of sustained opposition to substantial issues by any important part of the concerned interests and by a process that involves seeking to take into account the views of all parties concerned and to reconcile any conflicting arguments[14].

Each standard goes through a six stage process before being published as an ISO standard:

The first stage is the proposal stage in which a need for a standard is determined and members are identified who are willing to work on it.

The standards then enters the preparatory stage where a working draft of the standard is developed. When the working draft is completed, it enters the committee stage and is sent out for comments until a consensus is reached. The output of this stage is the Draft International Standard (DIS).

The DIS then enters the enquiry stage where it is circulated among all member bodies and then voted upon. If a DIS does not receive 75% of the vote, it returns to lower stages and work on it continues.

If it passes the enquiry stage, it becomes a Final Draft International Standard and enters the approval stage.

At the stage of approval, it will again circulate through all member bodies for a final vote and again it must pass this stage with 75% of the vote. If the standard passes this stage, it enters the publication stage and is sent to the ISO Central Secretariat for publication.

Non participation in voting:

In all votes throughout the various stages of development of a deliverable, abstentions are not counted as well as negative votes not accompanied by technical reasons.

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14 ISO/IEC Guide 2:2004; see **Error! Reference source not found.**.1, available at http://www.iso.org/iso/catalogue_detail?csnumber=39976, last visited on April 18, 2016.

Voting Rights:

In case two national bodies of the same country elect to participate in a Joint Project Committees, only one such body will be identified as having the administrative responsibility. The national body which is identified with the administrative responsibility has the responsibility of coordinating activities in their country, including the circulation of documents, commenting and voting.

Approval criteria:

1 If more than one quarter of all votes received is negative, the transformation into an International Standard is not approved and the approval process ends.

2 If the transformation of a Guide into a standard is approved, the International Standard will be published, and the original Guide withdrawn.[15]. Project stages and associated documents[16] are depicted in Table-2 below.

Project stage	Associated document	
	Name	Abbreviation
Preliminary stage	Preliminary work item	PWI
Proposal stage	New work item proposal [a]	NP
Preparatory stage	Working draft(s) [a]	WD
Committee stage	Committee draft(s) [a]	CD
Enquiry stage	Enquiry draft [b]	ISO/DIS IEC/CDV
Approval stage	final draft International Standard [c]	FDIS
Publication stage	International Standard	ISO, IEC or ISO/IEC

[a] These stages may be omitted, as described in **Error! Reference source not found.**.
[b] Draft International Standard in ISO, committee draft for vote in IEC.
[c] May be omitted (see 2.6.4).

TABLE-2: Project Stages and Documentation

(iii). Binding nature of the decisions

A standard that is covered in whole or in part by an IP right – in general and not specific or necessarily an IP right which is owned by a party and has to deal with SSOs. IP rights create divergent vested interests among participants in

15 Supra note 91 at 31.

16 Supra note 91 at 85.

SSOs which therefore delay formal standard setting and consensus on standardization less likely. In order to deal with these effects, SSOs often come up with or use formal or an informal mechanisms through rules that govern the ownership of the IP or joint defense arrangements to decrease the control of an IP owner's right on a standard that is to be adopted. Each IPR policy articulates about parties what the parties can or cannot do, should or should not do, might do and that which are encouraged to do including what parties are requested to do which is activities.

ITU

The Constitution and Convention of the International Telecommunication Union is of a treaty status and are binding on ITU Member States which are further complimented by the Administrative Regulations of Radio Regulations and International Telecommunications Regulations, which are binding on its members. The Constitution and the Convention and the Administrative Regulations states that the member states are bound to abide by the provisions of the Constitution, the Convention and the Administrative Regulations in all telecommunication office and stations [...] which engage in international services or which are capable of causing harmful interference to radio services of other countries"

Binding: All decisions that are taken internally are binding on all the members of the ITU, ISO and IEC while for others the recommendations are not. In the areas where these decisions that are binding can become the source of new international law.

Non-Binding: Majority of the work undertaken results as resolutions or recommendations for ITU and Deliverables for ISO and IEC in order to in order to ensure compatibility of technologies and systems worldwide. Though these recommendations and deliverables are non-binding considering the amount of impact of these resolutions, recommendations and deliverables the members accept these as regulatory.

2.3. Regional SSOs

Regional standards organizations

Regional standards bodies also exist, such as the European Committee for Standardization (CEN), the European Committee for Electrotechnical Standardization (CENELEC), the European Telecommunications Standards Institute (ETSI), and the Institute for Reference Materials and Measurements (IRMM) in Europe, the Pacific Area Standards Congress (PASC), the Pan American Standards Commission (COPANT), the African Organization for Standardization (ARSO), the Arabic industrial development and mining organization (AIDMO), and others. In the European Union, only standards created by CEN, CENELEC, and ETSI are recognized as *European standards*, and member states are required to notify the European Commission and each other about all the draft technical regulations concerning ICT products and services before they are adopted in national law. These rules were laid down in Directive 98/34/EC with the goal of providing transparency and control with regard to technical regulations.[17]

National standards bodies (NSBs)

In general, each country or economy has a single recognized NSB. A NSB is likely the sole member from that economy in ISO; ISO currently has 161 members. NSBs usually do not prepare the technical content of standards, which instead is developed by national technical societies. An example list of NSBs is provided in Table-3 below[18].

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17 European Union: Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations *Official Journal L* é04, 21.7.1998, p. 37–48. (This page also provides references to amendments.) See also European Commission: Enterprise Directorate-General: Vademecum on European Standardization. (This document contains a consolidated version of Directive 98/34/EC, dated 15 November 2003.) Accessed 2009-05-05.

18ISO Members, available at http://www.iso.org/iso/about/iso_members.htm, last visited Feb 21, 2012.

Organization	Abbreviation	Country
Bureau of Indian Standards	BIS	India
Badan Standardisasi Nasional	BSN	Indonesia
Brazilian National Standards Organization	ABNT	Brazil
Spanish Association for Standarization and Certification	AENOR	Spain
French association for Standardization	AFNOR	France
American National Standards Institute	ANSI	U.S.
British Standards Institution	BSI	UK
Dirección General de Normas	DGN	Mexico
Deutsches Institut für Normung	DIN	Germany
Instituto Argentino de Normalización y Certificación	IRAM	Argentina
Bureau of Standards of Jamaica	BSJ	Jamaica
Euro-Asian Council for Standardization, Metrology and Certification	GOST	Russia
Colombian Institute of Technical Standards and Certification	ICONTEC	Colombia
Luxembourg Institute for Standardization, Accreditation, Security, and Quality of Products and Services	ILNAS	Luxembourg
Japanese Industrial Standards Committee	JISC	Japan
Korean Agency for Technology and Standards	KATS	Korea (Republic)
Nederlandse Norm	NEN	Netherlands
South African Bureau of Standards	SABS	South Africa
Standardization Administration of China	SAC	China
Standards Council of Canada	SCC	Canada
Swedish Standards Institute	SIS	Sweden
Finnish Standards Association	SFS	Finland
Standards Norway	SN	Norway
Swiss Association for Standardization	SNV	Switzerland
Standards New Zealand	SNZ	New Zealand
it:Ente nazionale italiano di unificazione	UNI	Italy
Standards Australia	SAI	Australia
Jabatan Standard Malaysia	DSM	Malaysia

Table 3: List of National Standard Bodies (NSBs)

NSBs may be either public or private sector organizations, or combinations of the two. The Standards Council of Canada is a Canadian Crown Corporation, Dirección General de Normas is a governmental agency within the Mexican Ministry of Economy, and ANSI is a 501(c)(3) non-profit U.S. organization with members from both the private and public sectors. The National Institute of Standards and Technology (NIST), the U.S. government's standards agency, cooperates with ANSI under a memorandum of understanding to collaborate on the United States Standards Strategy. The determinates of

whether an NSB for a particular economy is a public or private sector body may include the historical and traditional roles that the private sector fills in public affairs in that economy or the development stage of that economy.

The above section provided a brief introduction to different regional SSOs. The following section provides an overview of some SSOs, which are mainly focused on setting standards for ICT sector.

Institute of Electrical and Electronics Engineers (IEEE)

Founded in 1884 as the American Institute of Electrical Engineers, the **IEEE** later changed its name to the Institute of Electrical and Electronics Engineers. Later, the organization broadened its activities in such a way that it decided to retain its acronym but jettison the name itself. IEEE's Constitution defines the purposes of the organization as "scientific and educational, directed toward the advancement of the theory and practice of electrical, electronics, communications and computer engineering, as well as computer science, the allied branches of engineering and the related arts and sciences." Unlike many other SSOs, IEEE is a professional association with over 300,000 individuals as members. It is perhaps best known as a journal publisher: the organization contends that it produces 30 percent of the world's literature in the electrical and electronics engineering and computer science fields, publishing well over 100 peer-reviewed journals. It also sponsors or cosponsors more than 300 international technical conferences each year.

As earlier noted, standards development in IEEE takes place in the IEEE Standards Association (IEEE-SA). While its historical roots are as an ANSI accredited SSO, IEEE has become global in its membership and influence. In 2005, IEEE had close to 900 actively maintained standards, with more than 500 under development. Its most influential ICT standards include those known as

Ethernet, Wi-Fi [19], Firewire, and Bluetooth.[20] The formal names for these standards are, respectively, IEEE 802.3, the IEEE 802.11 series, IEEE 1394, and IEEE 802.15.1. Interesting recent standardization efforts in the wireless area include WiMax and the ZigBee standard for low-distance, low-power communications.

It is worth noting that IEEE standards development activities are not limited to the area of ICT. In fact, standards issued by IEEE are used in fields and industries as varied as power and energy, instrumentation and measurement, mobile and stationary batteries (e.g. the IEEE 1625 standard for laptop batteries), nanotechnology, organic electronics, and transportation. It should also be noted that while industry has elected to pursue many efforts relating to a given domain within IEEE, companies have elected to launch efforts in the same domains elsewhere, often in consortia newly created for that purpose. When a group of companies wanted to develop and launch a new short range wireless standard, they opted to launch another SSO included in this study, the NFC Forum.

Class of members:

IEEE has two types of membership and processes. The membership depends on the type of project that a member wish to participate.

Individual Membership & Projects – Individual Membership is mostly relevant to independent professionals who are interested in participating in standards development with IEEE – SA, membership is not the only criteria for an individual to participate but the membership entitles the individual to participate in the ballot on standards and which will allow the individuals to assume the leadership roles in the standards working groups.

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19 Note that WiFi is a registered trademark of an independent membership consortium known as the WiFi Alliance, which develops certification tests for compliance with the 802.11 series standards, and promotion of such devices.

20 The IEEE 802.15.1 'Bluetooth standard' was ratified by IEEE but developed outside of IEEE by the Bluetooth Special Interest Group (SIG).

Corporate Membership & Projects – this type of membership is suitable and recommended for companies which are engaged in research and development of products and their marketing. The Corporate membership allows the member companies to work, develop, engage and influence the technology that are related to its business. IEEE allocates one vote for one company in all the matters.[21]

European Telecom Standards Institute (ETSI)

The **European Telecommunications Standards Institute** (ETSI) was established in 1988. At its inception, it took over (from CEPT) the development of GSM, a standard for mobile telephony that would eventually become one of the most successful technical standards of all times. Later, a broad range of new standards were added to its work program, including GSM's successor, the 3G UMTS/W-CDMA specifications, which were developed via the joint efforts of six SSOs acting together in the 3rd Generation Partnership (3GPP). ETSI's focus has always remained in the field of telecommunications, however, true to its original intent. While formed to function as a European regional body (and explicitly recognized as such in European regulations), ETSI's influence has expanded over time (like that of IEEE), and its standards are adopted on a worldwide scale.

In ETSI, IPR matters have resulted in heated debates in well-attended meetings open to all ETSI members. ETSI has a quite extensive IPR policy that continues to evolve, (e.g., with the recent addition of innovative elements such as general licensing commitments that are permitted to be made early in the development process. ETSI cooperated with the European Patent Office (EPO) to create an extensive upgrade of its IPR database, which includes thousands of patent disclosures. The evolution of its policies has not been wholly voluntary, however. At times, the European Commission (EC) has been strongly involved, arguing for certain changes deemed by the EC to be necessary to protect

21 Membership and voting rights, available at http://standards,ieee.org/membership/index.html, last visited 18th April, 2016.

competition.

Class of members[22]:

Full member: shall be established in a country falling within the geographical area of the European Conference of Postal and Telecommunications Administrations (CEPT)

Associate member: are the applicants who do not full meet the conditions of full membership.

Observer: are the members applicants fulfilling the conditions for full or associate membership but choosing not to have the right to participate fully in the proceedings of the Institute.

Decision making approach:

All decisions are taken based on the consensus basis but with different majority requirements which is explained as follows:

a. Policy decisions require a majority of 71% of the weighted individual votes that are casted by the members
b. The default rule for majority is 50% of the votes cast, but the Board may decide to vary this criteria in individual cases, considering the contentious decisions always can be overruled by the General Assembly

Voting and Quorum:

The Institute has adopted one vote one member policy. In any meeting of the General Assembly, the quorum that is present and represented by proxy requires at least 50% of the total number of weighted votes of full members.

Voting by correspondence may be performed between meetings if necessary. The widow period open for voting is 21 full calendar days. Voting is performed using the web-based decision support tool. In case of lack of quorum which is less than 50% of the Board Members or a negative result then the issue will automatically be deferred to the next meeting. The weighted votes is

22 ETSI Directives, Version 32, October 2013, available at http://portal.etsi.org/directives/32_directives_oct_2013r, last visited 19th April, 2016

provided in Annex-2 and 4[23], wherein the weights of full members and associate members shall have equal weights equal to the number of units of their class of contribution as determined according to Annex 2. And, in Annex-2, the number of units based on contribution (i.e., joining fee) is declared. A major disadvantage with this approach is that a particular member can end-up having more votes and these more votes may be even used to stall the amendments recommended by the other voters. A discussion indicates that the ETSI is attempting to amend it IPR policy and has not been successful as some incumbents holding large units are opposed to such amendments.

The American National Standards Institute (ANSI)

ANSI is a non-profit organization with several missions: it oversees the development of voluntary consensus standards in the United States by SSOs that it accredits, seeks to coordinate U.S. based standards development activities generally, and represents U.S. standards related interests globally. As such, it is not a standards setting organization itself, although the SSOs that it accredits have developed thousands of standards that are eligible to be recognized by ANSI as "American National Standards". Many of these standards, in turn, have been tendered to one of the three Big Is for consideration and adoption as global standards. ANSI's criteria for accreditation include certain IPR policy elements. ANSI defines a 'baseline' set of IPR rules that accredited organizations need to meet, although substantial freedom is permitted as regards the actual scope, details and other aspects of an SSO's individual IPR policy, as long as they do not conflict with the minimum requirements established by ANSI. The 'minimal IPR policy' of ANSI is quite short, although there is a clarifying document that gives it more flesh. ANSI staff members are available to provide guidance to SSOs on issues relating to whether a given IPR policy term does or does not meet the baseline requirements, and ANSI rules and policies relating to IPR matters in turn are subject to ongoing internal review by established committees.

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23 ETSI Directives, version 35, December 2015, available at https://portal.etsi.org/directives/35_directives_dec_2015.pdf, last visited on May 21, 2016.

Members and voting rights:

The members are classified into organizational, government, company, educational, international and individual, the provisions of Sections 2.01.1-2.01.6 which are explained and defined below and the Board of Directors have the power to create other or new categories of membership from time to time.

Organizational Member: these are not-for-profit, technical, professional, labour, consumer, trade or other association or organization that are involved in standards, conformity assessment or related activities.

Government Member: Is the member which is a department, authority or agency of the United States government or of any State, interstate, regional or local government, interested in the work of the Institute.

Company Member: is the member which is a corporation, partnership or any other entity that is created under the laws of the United States or any State thereof and that is engaged in industrial or commercial enterprise or professional, educational, research, testing or trade activity.

Educational Member: is an educational member which shall be a domestic not-for-profit institution of higher learning, not otherwise eligible for membership, which is interested in the development of voluntary standards.[24]

International Member: is an entity that is engaged in the activities of an organizational, company or educational member but that is not created under the laws of the United States or any State thereof.

Quorum: one tenth of the Members of the Institute entitled to vote shall constitute a quorum for the transaction of business at all meetings of Members.

Voting Rights: Each member shall have one vote without any restrictions on the type of the member except the International members who do not have the right

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24 American National Standards Institute, Constitution and By-Laws, 2015, available at http://www.ansi.org/news_publications/news_story.aspx?menuid=7&articleid=89db4eee-a81a-4ac4-ba9e-8f6b46cd9b74, last visited on April 19, 2016.

to vote. Other class of members are created by the Board of Directors (BOD) or the Executive Committee (EC) shall not have the voting privileges unless expressly provided for by the BOD/EC which created such membership.

Proxies: A member can authorize another person to act as a proxy member by providing an authorization in writing or by electronic mail to the person who holds the proxy provided such electronic email conforms to the standards set out in Section 8.07 of the By-Laws of ANSI.

Dispute Resolution

As per the provisions of Section 12.01 of Constitution and Bylaws's of ANSI Parliamentary Procedure. All questions of parliamentary procedure not covered in these By - Laws shall be resolved according to Robert's Rules of Order (latest edition). As per the provisions of Section 12.02 Exhaustion of Remedies of Constitution and Bylaws' of ANSI, each member agrees that if a dispute shall arise between the member and the Institute, the member shall in the first instance be obligated to pursue and exhaust all administrative appeals available to it within the Institute.

The Internet Engineering Task Force (IETF)

IETF grew out of early standardization efforts that arose in connection with the development of the Internet in the late 1960s and 1970s. Over time, this loosely-coordinated group of academic, industrial and governmental engineers began to refer to itself as the Internet Engineering Task Force. Today, IETF activity is funded by and conducted under the auspices of the Internet Society, a District of Columbia non-profit corporation based in Reston, Virginia and Geneva, Switzerland. It has two elected governing bodies, the Internet Architecture Board (IAB), which operates relatively independently of IETF standards development, and the Internet Engineering Steering Group (IESG), which oversees standards-setting at IETF. IETF develops Internet standards, and is perhaps best known for the TCP/IP protocol suite. The TCP/IP protocol is possibly one of the most used

and most successful protocols in the world, and also provides the basic building blocks for many other system standards, such as 3GPP.

Membership

Involvement and contribution to IETF processes is on individual basis, and there is no formal membership or membership environment in the traditional sense. Interested persons become active in IETF by participating in discussions on mailing lists, contributing drafts relating to technology, or simply showing up at meetings. It has rightly been observed that, "technical competence is the only requirement for contributing; there is no such thing as membership."

Voting

There are no formal membership voting mechanism for the approval of standards: to gauge support for proposed standards, IETF uses the principle of 'rough consensus and running code', and consensus at in person meetings is sometimes measured by assessing the volume of group humming (!). In short, IETF practices are, in large part, the evolutionary legacy of the rather specific culture and attitude of the individuals that were involved in the early development of the Internet. Not surprisingly, this legacy has had an impact on the IETF IPR policy, which is rather different from the policies of other SSOs.

The IETF IPR policy today states that, in general, IETF prefers to adopt technologies not encumbered by known IPR claims.[25] If patented technologies are included, it is generally because it is felt that the patented technology in question is sufficiently superior to alternatives with fewer IPR claims and/or claims subject to free licensing that the technical benefits of inclusion outweigh potential licensing costs.[26] The IETF IPR policy also includes a requirement that

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25 IETF, 2005, p. 12.

26 RFC 3979 (IETF, 2005, p. 12) states: "In general, IETF working groups prefer technologies with no known IPR claims or, for technologies with claims against them, an offer of royalty-free licensing."

patents and patent applications known by IETF participants and held by their employers and which cover technology under consideration by IETF must be disclosed as early in the development process as possible.

Organization for the Advancement of Structured Information Standards (OASIS)

OASIS is an organization that focuses on the development, convergence, ~~and adoption of e-business~~s and web service standards. It was formed with a more limited charter in 1993 under the name SGML Open. Like the W3C, it is one of the hundreds of SSOs (most often referred to as 'consortia') that have been formed since the early 1980s outside the hierarchy of the historical standards development infrastructure. One reason for its inclusion in this study is the fact that through a series of revision of its IPR policy, OASIS developed a new and more flexible approach to assigning obligations relating to essential claims. There were several incentives for this evolution. First, whereas in many technology areas the existence of a RAND policy first seen as perfectly acceptable, some of the areas in which OASIS is active often do not, and this bias increased over time. Second, the increasing breadth of OASIS's technical activities and the number of its active working groups continued to increase. The result was that a "one size fits all" policy became increasingly inflexible to cover the full breadth of the SSO's activities, some of which involved standards addressing licensing fee tolerant commercial areas and some of which did not. The result was the adoption in 2005 of a 'multi-track' IPR policy that allowed a working group to be chartered under a rule set that either did, or did not, allow participating members to require payment of licensing fees in connection with an otherwise RAND commitment. As with the W3C, adoption followed a lengthy (two year) development and approval process. The OASIS policy was further amended in the years that followed, and now includes four optional tracks, one of which is crafted to particularly facilitate the implementation of standards in software made available under all of the commonly used open source licenses. According to representatives of OASIS, the addition of IPR tracks oriented towards the issuance of royalty-free standards with greater flexibility of

implementation in open source software created a more 'license-centric', with decreased reliance on disclosure rules. This shift of focus was believed to provide greater protection for users of OASIS standards.

Members:

OASIS has following categories of membership and dues designed to fit all those who are affected by open standards and allows them to have a voice in their creation.

Contributor: are the organization members which comprise of small government agencies, academics and non-profit associations who participate fully in the committee work. This class of membership does not provide visibility or marketing benefits, instead the members opting for contributor class are the one's who represent a user company with a need to monitor standards development and learn about standards implementation relative to core business goals, a startup or a consultancy seeking to expand market position through standards expertise, a local or small government agency wishing to reduce the risk in recommending new technology, a non-profit industry group, trade association, or standards-setting body coordinating domain efforts with foundational work, a university or research center applying academic resources to influence technology, an organization that does not require public recognition in OASIS promotional materials, press releases, newsletters, web sites, conferences, exhibitions, and other events.

Sponsor Membership: Sponsor membership provides full range of benefits that a vendor or large user organizations and government agencies need. It provides unlimited committee participation with a visibility and marketing benefits. . This class of members participate in interoperability demos, workshops, webinars and presentations at conferences. Further, these members enjoy the benefits of having their logos and links appearing on the OASIS web site, they support the adoption activities that nurture the growth of standards compliance products. These members are the organizations who are software vendors providing standards based products and services, implementers of standards or

users of the standards-compliant software, a national government agency intending to ensure interoperability, a company wishing to make connections for potential merger or acquisition opportunities or any organization that finds value in having its contributions to open standards publicly recognized in OASIS promotional materials.

Foundational Sponsor Members: These are the industry leaders committed to open standards, who are recognized as industry leaders and innovators. These members receive maximum participation, visibility and promotional benefits including the choice of two premium sponsorships.

Personal Members: They are individual members who employed by an organization, self employed or unemployed. They have limited participation privileges to the committee work with no marketing or visibility benefits and not eligible to vote in the standards or elections of the Board of Directors further, these memberships are non-transferable.

Individual / Associate Member: They are the members who are employed by an organization and represent these organizations and bound by the membership agreement and policies of OASIS.

Voting: Each voting member is entitled to one vote on each matter. Voting is through voice or ballot however, election of directors are done only by ballot.

Quorum: One third of the voting members of the corporation. [27]

VMEbus International Trade Association (VITA)

VITA, originally named the VMEbus International Trade Association, began its existence as a trade association focusing on a specific interconnect technology called VMEbus. Since then, VITA standardization activities have expanded to a number of other areas involving electronics and connectors for high-demand environments such as avionics, military and industrial applications. Standards setting does not take place within VITA itself, but in an affiliated entity

27 Member Section Policy, available at https://www.oasis-open.org/policies-guidelines/member-sections, last visited 24th April, 2016

called the VITA Standards Organization (VSO). As with IEEE, the industry commonly refers (as do we) to the non-standards setting affiliate. One reason for the inclusion of VITA in this study is the fact that it is one of only two SSOs (IEEE being the other) that has received the non-binding approval of the U.S. Department of Justice to provide for *ex ante* disclosure of patent licensing terms by its members prior to voting on approval of a standard. Unlike IEEE, which merely permits its members to disclose licensing terms *ex ante*, VITA requires members to make *ex ante* disclosure of the most restrictive licensing terms (including economic terms) that the owner of an essential claim reserves the right to require.

VITA differs from the average SSO in other respects as well. A VITA representative reported to us that VITA believes that an SSO's duty to its membership as a whole is more important that its duty to any one individual member. This stands in contrast to most consortia, which are mindful that virtually all of their revenues are derived from membership dues, and are therefore unlikely to take actions against a member that is likely to be viewed as objection-able. The VITA copyright rules applicable to its standards are also novel, in that they permit members of working groups to leave VITA if they wish, and continue to work on the same project in another SSO.

VITA has been particularly ambitious with respect to the duties and responsibilities it has assumed, perhaps to a greater extent than any other SDO. While other SSOs invariably leave enforcement of obligations assumed under their IPR policies to their members, VITA declared that it will enforce all essential claim disclosure terms and conditions, and any other rights under agreements the organization may hold with the owners of essential claims, as well as take action against what it believes are frivolous assertions of essential claims. VITA's IPR policy also requires that members submit to binding arbitration when conflicts arise over essential claims.

World Wide Web Consortium (W3C)

W3C, as its name implies, develops standards used in connection with the Web, among other technologies. It was founded by the original inventor of the Web as we know it, Sir Tim Berners-Lee, after he left the European Organization for Nuclear Research (CERN) in October, 1994. He still leads the organization today, although not on an operational basis. Early in the development and deployment of the Web, and partly as a result of Berners-Lee's decision not to patent its underlying technology, a culture of free license rights for Web infrastructure developed and took firm hold. Concurrently, open source software became increasingly commonly used to provide the software 'stack' supporting the servers that enable the Web's existence. The result was the adoption by W3C in 2003 of an extremely license fee intolerant Patent Policy. Due to the very large membership of the W3C and the degree of effort that went into constructing a policy that could ultimately be approved by its members, the W3C policy's approach (and sometimes its wording) has been used as a model by other SSOs wishing to achieve similar goals, providing another reason for the inclusion of the W3C policy in this study.

High Definition Media Interface (HDMI) Forum

Like VITA, the **HDMI Forum** focuses on a single technical goal, in this case, specifying a compact audio/video interface that enables the transfer of uncompressed digital audio/video data from one compliant device to another. The standard is suitable for use in televisions, DVD and Blu Ray players, video cameras, computers, and other devices.

The HDMI technology and the related standard (originally known as HDMI 1.4b) were created by a group of seven companies, beginning in 2003. While it is not unusual for a new consortium to be formed around a technology and a technical specification that was already in existence at the time of formation, HDMI Forum is unusual because the ongoing efforts of the Forum are contractually limited to the maintenance of the HDMI interface standard. Moreover, implementation of the standard continues to require the payment of royalties to the seven founders. Payment of royalties is accomplished via a

collective licensing programme administered by HDMI Licensing, LLC, an entity formed for that purpose. The proprietary foundation of the HDMI Forum is echoed by the Forum's IPR policy, which provides that any *further* development of the standard within the Forum will be protected by agreements that each participant must sign. Under those agreements, participants must agree not to assert any essential claims against implementers of the standard. In other words, the IPR policy does not cover the original standard, but only additions to the standard.

Near Field Communication (NFC) Forum

The Near Field Communication (NFC) Forum is a non-profit consortium formed in 2003 to develop, maintain and promote the use of its short-range wireless interaction specification in consumer devices. A typical application could be a mobile phone held close to a payment terminal that utilizes the NFC to exchange information with, and facilitate a payment using, the terminal. Like VITA and the HDMI Forum, its focus is on a single technology-enabled goal.

In addition to its standards development and promotional activities, the Forum supports a global branding and certification campaign to help enable and support the interoperability of compliant mobile devices of every type, embedded radio tags, and other elements of supporting IT infrastructure. All NFC Forum members must respond to requests for disclosure and licensing of essential claims, whether they own such claims or not, thus minimizing the chance of later assertion of essential claims.

2.4. Comparative Analysis of the Patent Policies

An overview of the salient characteristics of few ICT SSOs is provided in Table 5[28] below:

TITLE	TYPE	GEOGRAPHICAL FOCUS	TECHNOLOGY FOCUS	NOTABLE IPR POLICIES

28 Patent Challenges for Standard-Setting in the Global Economy: Lessons from Information and Communication Technology, available at http://www.nap.edu/catalog.php?record_id=18510, , last visited on Nov1, 2015.

International Organization for Standardization (ISO)	Formal	Global	Broad	Share common policy with ITU and IEC but permit adjustments
International Telecommunications Union (ITU)	Formal	Global/UN affiliated	Communications	Shares common policy with ISO and IEC
International Electrotechnical Commission (IEC)	Formal	Global	Electronics and Electronics-related technologies	Permits but does not require *ex ante* disclosure of terms
Institute of Electrical and Electronics Engineers-Standards Association (IEEE-SA)	Formal Professional Association	Global	Broad Electronics	Reviews IPR policies as part of accreditation *New IPR policy accepted by the SA board.
Internet Engineering Task Force (IETF)	Consortium	Global	Internet	Preference for non-patented technology
ANSI	Formal	Global		
Organization for the Advancement of Structured Information Standards (OASIS)	Consortium	Global	e-business and web services	Multi-modal IPR Policy
VMEBus International Trade Association (VITA)	Consortium	Global	Avionics, military, and industrial applications of electronics	*Ex-ante* disclosure of licensing terms; binding arbitration of disputes
World Wide Web Consortium (W3C)	Consortium	Global	Internet and web	Royalty free (RF) license.
High Definition Multimedia Interface (HDMI) Forum	Consortium	Global	Digital audio/visual transmission	Non-assertion
Near Field Communication (NFC)	Consortium	Global	Data exchange among consumer devices	
European Telecommunication Standards Institute (ETSI)	Formal	European based but international	ICT Broadly	FRAND

TABLE-4: Salient characteristics of some of the ICT Standards bodies

These SSOs have a diverse set of stakeholders and constituents. Some participants are technology contributors or owners (eventually end up being SEP holders) whose business models depend on sales of products or services and less on royalties for SEPs, although they may want their patents to have sufficient value to offset the rights held by others in the same technology area. Other participants are technology sellers (eventually end up being SEP holders whose motive is to seek royalties from standards implementers) whose models are based on royalties from implementers for SEPs and even non-SEPs. Others are technology users or Standards Implementers who would want to obtain licenses to use SEPs for either low or no royalties. And, still others are both technology users and sellers, who may assume different postures in different standards-setting processes. SSOs' IPR policies are shaped both by the

interests of existing members and by the need to attract new participants who may be technology sellers, users, or both. This divergence of interests and the difficulty of reconciling them may account for the fact that very few SSO articulate a clear set of objectives for its IPR policies, making it difficult to evaluate their effectiveness. For most SSOs, the minimum goal of IPR policies is to ensure that SEP claims are reasonably known to the participants and are available for licensing under a FRAND or a similar framework thus minimizing the potential for *ex post* hold-up and royalty stacking. Also, there is wide variation and considerable ambiguity in the disclosure and licensing rules, which will be examined and analyzed in subsequent chapters.

2.4.1 Binding Nature, compliance and enforcement

IPR policies provide a frame work for the members to indicate what each member shall or shall not do, should do, might do, are encouraged to do, are requested to do. Some elements in the IPR policies may be binding in nature. Table 5 below illustrates elements which are believed to create binding rules. The "legal binding" is created by the signing the documents while taking-up the membership, by the bylaws, the rules and regulations documents, and the process. The duty to adhere to provisions in the IPR policy may arise due to provisions - (a) specifically provided in a membership application or agreement that becomes a legal contract between the member and the SSO (or, in the case of an unincorporated SIG, among the members themselves); (b) referenced by the membership application but the actual provisions are in some other documents such as Rules and Regulations (R&R) or bylaws; and (c) included in bylaws or policies that are not explicitly referenced in any document signed by a member, but which are intended to be legally binding as a result of applying, and being accepted, for membership. Those bodies that have their IPR policy as Statutes, Bylaws or Rules of Procedure, typically have more detailed procedures defined in 'Guidelines,' 'Rules of Procedure' or similarly named documents. Some examples of the documents that create legal binding nature are "Declarations', 'Letter of Acceptance', 'Letter of Assurance' or such other documents provided by the members before working on the standard.

Provisions in the IPR policy apply equally to all the members irrespective of the type of membership. The details of rules including disclosure and licensing obligations may be found in several documents related to each SSO. Only a small number of organizations (such as IETF) have existed that do not have a formal membership structure. These SSOs have explored other ways to create binding obligations such as creating lightweight development efforts modeled on open source development processes, which have been launched on line. However, the success of such efforts is yet to be seen.

However, ensuring compliance and enforcement at the level of SSOs has been a difficult task, generally. SSOs request their members to adhere to disclosure and licensing commitments and if the member does not disclose or is willing to license, the SSOs may not include such technology solutions into a standard. SSOs do not have the wherewithal to ensure compliance and/or enforce. However, a particular behavior (such as not complying with disclosure obligations or unwilling to license on FRAND terms) may be used as grounds and evidences in a court litigation. As clarified by representatives of ITU, ISO, and IEC, disclosure obligations are binding upon participants in these organizations. In the ITU, participants would typically be representatives of members, whereas for ISO and IEC, a specific phrasing was adopted to ensure that both direct participants as well as those participating in Working Groups hosted by national standards organization (a usual way to be involved in these bodies) would be included in the definition. In ANSI, the binding nature of disclosure will depend on the rules of the specific ANSI-accredited SSO. But these rules must be compatible with the ANSI baseline policy. Legal obligations in ANSI-accredited SSOs will typically come from membership or from participation in that SSO (by signing a 'Letter of Assurance'). The IETF RFC 3979 requires the members to '*deemed to agree*' to this RFC and as such IETF policies are binding on all IETF participants, as well as their employers/sponsors under well-established equitable and legal principles and in IETF, participants register for meetings, sign attendance sheets, receive notifications of policies (via the web site and a widely-distributed document known as the "Note Well" document, and must indicate

their acceptance of the Note Well document prior to registering for an IETF meeting or mailing list. While IETF does not have a formally-constituted membership, a legal relationship, and a set of binding legal arrangements, are in place between IETF and its participants. OASIS has a licensing by default design: licensing obligations as to specific patent claims and standards arise directly from the policy, not from a separate declaration. The policy specifies that obligations arise through enrollment in a specific Working Group ('Technical Committee'). As earlier noted, the specific obligations that will apply with respect to a given Technical Committee are specified in its charter. VITA members' obligations arise from membership and the execution of a member-ship agreement and even by reading the draft standards as the draft is accessible only to members. Also, the open sheet of the draft has a written statement on obligations and a reader (even a non-member) would be obligated by those legal obligations.

Further, some SSOs (e.g., IEEE) require undertakings to be signed by non-members (e.g., as mentioned above a non-IEEE member CISRO signed the IEEE undertakings) before disclosing their patents and technology. As mentioned above the obligations of the present patent owner transfers to a subsequent owner as well. (as in case of Nortel discussed above).

ITU/ ISO/IEC	IEEE	ETSI	ANSI	IETF	OASIS	VITA	W3C	HDMI	NFC

Basis for Disclosure obligations	*ITU:* Resolution *ISO/IEC:* Directives	***Bylaws***	***Rules***	***Patent Policy***	***RFC***	*Membership Agreements*	***Policy***	*Membership Agreements*	*Bylaws and Agreements*	Policy, Rules, Agreements
	Binding: YES	***Binding:*** YES	***Binding:*** YES	***Binding:*** YES	***Binding:*** YES	***Binding:*** YES	***Binding*** YES	***Binding:*** YES	***Binding:*** YES	***Binding:*** YES
Basis for Licensing obligations	*ITU:* Resolution *ISO/IEC:* Directives	***Bylaws***	***Rules***	***Patent Policy***	*No Such obligation*	*Licensing by default*	***Policy***	*Licensing by default*	*Licensing by default*	Policy, Rules, Agreements
	Binding: YES	***Binding:*** YES	***Binding:*** YES	***Binding:*** YES		***Binding:*** YES	***Binding*** YES	***Binding:*** YES	***Binding:*** YES	***Binding:*** YES
How Declared?	Declaration (D)	D LoA	D	D LoA	D Terms by patentee	TC membership	D Form	WG participation	All members	D

TABLE- 5: Binding Nature of IPR Policies

As mentioned above, generally, one of the basic objectives of the IPR policies is to ensure that licenses for SEPs are available to all on FRAND or RF terms and the *disclosure and licensing (D&L) statements* (e.g., undertaking, declarations, LoAs etc.,) to ensure such obligations are adhered to by the SEP holders. In some SSOs, Disclosure and Licensing (D&L) obligations arise based on the fact that an organization or an individual became a member of that SSO even without signing specific D&L documents. However, the members may opt-out to if they do not wish to disclose their IP and make licensing commitments.

Table - 6 provides an overview of general elements of licensing requirements of some of the SSOs discussed above.

Table. 6: General licensing commitment procedure[29]

	ITU/ISO/IEC	IEEE	ETSI	ANSI	IETF	OASIS	VITA	W3C	HDMI Forum	NFC Forum
Method of entering into commitment	{Participants are obliged to submit a declaration if triggered by a disclosure} Non-members are requested to confirm their position	Request for declaration sent to firms suspected to own essential IPR	Members Who knowingly own essential IPR are obliged to Submit declaration Non-members are requested to confirm their position	{Left to the accredited SSO}	Request for declaration sent to firms suspected of owning essential IPR {Though not often used; many IETF participants voluntarily make licensing disclosures}	Licensing commitments arise from participation Or contribution	Members who own essential IPR are obliged to submit declaration	Licensing commitments arise from participation	Licensing commitments (= non-assert) arise from membership	All members must respond, regardless o whether they own essentia claims
Timing of commitments	Participant: at time of disclosure Non-participant: upon request	As soon as reasonable possible Upon request {although request procedure not often used}	Member: at time of disclosure Also upon request	Upon request	Upon request {although request procedure not often used}	Arises on enrolling in specific Technical Committee	Early; 4 categories defined (linked to disclosure	n/a	n/a	Precisely specified for categories o participation
Beneficiaries Of commitments	Any implementer	Any Implementer	Any implementer	Any implementer	Depends on commitment	Any Implementer	Any implementer	Any implementer	Members or licensees of HDMI Forum	Any implementer
Geographic scope of commitment	Worldwide	Worldwide	[Worldwide]	Not specified	Not specified	Worldwide	Worldwide	Worldwide	Worldwide	Worldwide
Commitments (declarations) Are irrevocable	Yes (upgradable)	Yes	Yes	Not specified	Not specified	Not specified	Yes (upgradable)	Yes	Yes	Yes
Licenses are irrevocable (except as permitted)	Not specified	Not specified	Yes	Not specified	Not specified	Yes	[Yes]	[Yes]	n/a	[Yes]
Defensive	Not	Not	Not	Not	Not	Allowed	Allowed	Allowed	Not	Not specifie

29 Rudi Bekkers and Andrew Updegrove IPR Policies and Practices of a Representative Group of Standards-Setting Organizations Worldwide, available at http://sites.nationalacademies.org/PGA/step/PGA_058712, last visited on April 19, 2016.

suspension condition	specified	specified	specified	specified	specified				specified	
Licenses must be perpetual	Not specified	Not specified	Not specified	Not specified	Not specified	Yes	Yes	Yes	Not specified	Not specifiec
Opt-out Options	Licensing commitment template has option for 'no license'	Licensing commitment template has option for 'no license'	Licensing commitment template has option for 'no license'	Silent	IPR Disclosure template has option for 'no license'	A specific procedure is available	{Available}	A specific procedure is available	None	Yes, via a specific procedure, except for submitters
Reciprocity Condition	Bilateral RAND reciprocity allowed Bilateral RAND-RF reciprocity allowed	Not specified	[Bilateral] RAND reciprocity allowed	Not specified	[Allowed]	Universal reciprocity allowed	Bilateral RAND reciprocity allowed	Universal reciprocity allowed	Automatic bilateral reciprocity	Reciprocity i permitted Bilateral RAND-RF reciprocity allowed

SSOs use various means to receive and record the D&L statements namely – (a) General Obligation to submit D&L statements; (b) SSO's requesting presumed IPR holders to submit D&L statements; and (c) Obligations arising from participation or contribution. ITU/ISO/IEC, ETSI, VITA and NFC Forum have general disclosure obligations and this general obligation applies to participants and/or members. Disclosure and Licensing obligations are triggered at the same time and many SSOs have a single declaration form to commit to both the disclosure and licensing obligations. IEEE and IETF send specific request to IPR holders (members and non-members) who are presumed to hold patents that are relevant to that SSO. However, majority of the times the D&L statements are filed under a general obligation provision to submit D&L statements and the need for SSOs sending a request to the presumed IPR holders is rare. It is understood that the members voluntarily take the initiative to submit D&L statements and in IEEE[30] this is reported as being quite common. OASIS, W3C and HDMI have adopted a policy under which the obligation to disclose arise from the fact that an organization has become a member and is participating and/or contributing to the technical committees or work

30 IEEE Patent Letter of Assurance (LOA) Process Flowchart, available at https://development.standards.ieee.org/myproject/Public/mytools/mob/flowchart.pdf., last visited on April 18, 2016.

groups. In OASIS the licensing commitments may arise when participants (a) submit a contribution to OASIS TC proposed for inclusion into a standard; and (b) by being a participant in a respective TC, however, the definition of a participant is not clear.

As mentioned earlier, the timing of licensing declarations are linked to timing of disclosures in ITU/ISO/IEC, ETSI, and VITA. The timing of licensing declarations is based on the receipt of such a request from the SSOs (such as IEEE and IETF) if there is a presumption that an IPR holder holds a patent asset, however, most SSOs encourage IPR holders to submit declarations without waiting to receive a request from the SSO. VITA and NFC Forum have defined times when licensing declarations must be received. Organizations with licensing-by-default rules have no specified timing, although they may have a variety of different 'opt-out' terms with associated timing requirements. Further, most of SSOs D&L are aimed at benefiting any implementer (a member and a non-member), however, in HDMI, the D&L is aimed to benefit only the members of HDMI Forum or those who have entered into a licensing agreement with HDMI Forum. Another important aspect and development in the crafting the IPR policy is inclusion of a term "third party beneficiary", which means that anybody implementer (member or a non-member) is legally empowered to assert the promise that a SEP holder has made to the SSO. It avoids the question of whether a third party has the locus-standi to assert the promise made the SEP holder to the SSO. This provision helps the SEP implementers to act under the promise (mostly a FRAND commitment) that a SEP holder has made to the SSO. This provision would allow the SEP holder to be compensated by FRAND royalties and to a great extent reduces the risk of SEP abuse by the SEP holders against a non-member implementer of standards. Another important aspect of the licensing commitments is whether the licensing commitments are global. Most of the SSOs prescribe that the licensing commitments are global in nature, however, some SSOs such as ANSI and IETF's IPR policies are either not clear or they have not specified whether the licensing commitments are

global in nature. Also, ETSI allows a patent family member to be excluded from the licensing commitment. This uncertainties or ambiguities and non-uniformities may allow SEP holders to refuse licenses in certain geographies and such restrictions may be potentially used as an opportunity to extract non-FRAND royalties.

Some SSOs such as ITU/ISO/IEC have IPR policies that allow licensing commitments to be upgradable but only to be more favorable to a licensee (a commitment to license the SEPs on a world-wide basis cannot be downgraded to a specific geography or geographies). Some other SSOs such as W3C have IPR policies in which the licensing commitments are irrevocable unless and the relevant Recommendation is no longer in effect. NFC's IPR policies provide that a licensing commitment to a new licensee may be different from that of the existing licensees and the licensing commitments to the existing licensees are not revocable. Some SSO polices such as that of OASIS, VITA, and W3C allow defensive suspension under limited circumstances i.e., such a condition allows the licensor to suspend the license if the licensee (first) sues them for infringement of one of their own patents on the same standards (see the text of the respective policies for the exact definitions used. However, none of the other SSOs have provisions for defensive suspension in their IPR policies. SSOs such as OASIS, VITA, and W3C provide for perpetual licenses and none of the other SSOs specify anything about perpetuity and the inference is that for such SSOs the licensing commitment is time bound.

While SSOs will typically want to ensure the availability of all necessary licenses to implement their standards, they usually recognize that it might be unreasonable or inappropriate to force a patent holder into licensing under certain circumstances. This can be of particular concern where the SSO is active in the technology area in which the 'crown jewel' patents of members can be found - those which give them their competitive edge in the marketplace. A frequently articulated fear is that a member's

competitors might conspire to deliberately draft a standard in such a way as to include the member's essential IPR after that member has become bound by a mandatory licensing obligation. Another situation in which a firm may want to opt out is when it believes that a standard's final text extends beyond what was implied in a working group charter. As currently used in SSO circles, there is a distinction between withholding a commitment to license and exercising an 'opt out option'. The former describes the third option in the traditional RAND-based SSO IPR policy (i.e., to state that the respondent does not agree to provide a RAND licensing commitment), as offered in the polices of ITU/ISO/IEC, ETSI, VITA and NFC, while the latter is generally used to refer to a provision found under a policy that includes mandatory or default licensing terms of OASIS, VITA, and W3C. Opt out mechanisms can operate in a variety of ways a licensing obligation may not attach until a member has participated in a Working Group for a time period allowing it to determine its level of interest (e.g., 60 days), or a participant may be able to drop out up to a certain point in time, but not later. In some SSOs, the consequences can be more severe (e.g., the member loses its membership, without a refund of its membership fees for the unexpired portion of the current membership year). As a generality, the severity of the penalty parallels the narrowness of the scope of work of an SSO. SIGs are generally formed to develop a single standard, and members can therefore determine in advance their degree of interest in the SIG's goals, and the potential overlap of the eventual standard where their patent portfolio. In such a situation, there may be no opt out option at all (HDMI Forum provides an example). On the other hand, in an SSO with a broad remit, such as W3C or OASIS, a potential member may have great interest in some technical initiatives, and little or none in others. Currently, opt out provisions are uncommon in ANSI-accredited SSOs for a variety of reasons including the fact that there are comparatively few ANSI-accredited IT SSOs, because such clauses are needed only when a mandatory RAND-Free obligation would otherwise apply, and because it is difficult to contract a RAND-Free IPR policy while remaining in conformance with other accreditation requirements. That said, OASIS, which includes a RAND-Free

Working Group option in its IPR policy, was recently accredited by ANSI.

IPR holders that commit themselves to RAND (or other) licensing conditions may be concerned that at some point they could face a situation where they are obliged to grant a license to an organization that refuses to license its own essential IPR back under similar conditions. To prevent this, organizations may include a condition of reciprocity in the licenses they grant. In the context of this study, there are two forms of reciprocity:

- Bilateral reciprocity means that the licensee must offer its own essential claims under the same standard on the same conditions (e.g. RAND or RAND-RF) to the licensee (but not necessarily to other members or implementers).
- Universal reciprocity, meaning that the licensee must also offers its essential claims IPR for the same standard on the same conditions (e.g. RAND or RAND-RF) to all implementers.

- ITU/ISO/IEC, ETSI and VITA allow bilateral reciprocity conditions;
- In HDMI Forum and NFC Forum, bilateral reciprocity is automatically the case;
- OASIS and W3C allow universal reciprocity conditions;

Another important factor is that none of the policies discussed above (except the IEEE's revised IPR policy of 2015) imposes any restrictions on what legal remedies a member or the intended beneficiary of a licensing commitment may pursue in court. A school of thought argues that because of the FRAND commitment only the economic terms of a license (i.e., reasonable royalties) remain as the subject for a legal dispute. This is a significant position, because under the laws of some jurisdictions, an injunction against the sale of goods will not be awarded by a court if the party alleging dispute can be adequately compensated by a monetary award if it prevails in court. However, an opposing view is that injunctive relief is one of the key things an IPR owner should be entitled to seek if its patents are infringed. The answer to this question can have immense commercial significance, and that significance can be greatly magnified

where every vendor has no choice but to implement a standard that necessarily results in the infringement of the patent claims in question. This will be discussed in detail in chapters 6 and 7.

Conclusion

While there are several commonalities in the IPR policies related to disclosures, but equally there are many differences in the implementation and details of disclosure obligations. Further, there are many uncertainties and ambiguities in the IPR policy. Policies are often not explicit about these goals, or any other goals that an individual SSO might choose to pursue. Two exceptions can be found in the IPR policies of IETF, which includes the brief statement that: *"the aim of the disclosure requirement is to provide information about specific IPR against specific technology under discussion in the IETF and NFC Forum states that disclosure is intended to minimize the possibility of inadvertent infringement of the IPR of Members by using or implementing any Consortium Specification".* Out of the 3 international only members (93 members in ISO, 53 in IEC, and 189 in ITU) have the rights to vote and in one SSO each members can purchase shares and the number of votes, which can be exercised is based on the number of shares held. In the remaining 8 SSOs, each member has a voting right. Of these 12 SSOs, 5 are formal SSOs, 6 are consortia type, and one is a formal association of professional members. These 12 SSOs bind their members to perform responsibilities such as duty to disclose and to license but, they use different methods to arrive at the outcome. To bind the members to disclose their patents of the 12 SSOs, 1 SSO uses resolution, 2 SSOs use directives, 1 SSO uses byelaws, 1 SSO uses rules, 2 SSOs use patent policy, 1 SSO uses both byelaw and agreements, and 1 uses policy, rules and agreements. To bind the members to license their patents of the 12 SSOs, 1 SSO uses resolution, 2 SSOs use directives, 1 SSO uses byelaws, 1 SSO uses rules, 2 SSOs use patent policy, 3 SSOs uses a default mechanism by which each member is obligated to license their SEPs if they become members, and 1 SSO has no obligation to license, and 1 SSO uses policy and rules.

Irrespective, it appears that disclosure provisions have failed to meet the set objectives and there is a need to objectively view the usefulness of disclosure policy for SSOs. As far as licensing is concerned, there are several commonalities and several differences too and in many cases there appears to an imbalance and this imbalance may be favorable to licensors. It appears that there is a need for SSOs to revise their licensing policies to correct these imbalances, which will help reduce anti-competitive practices and that in turn will enhance innovation and interoperability. Providing members with units commensurate with the contributions made may adversely impact the SSO's ability to make changes/amendments to its rules and policies and thus the rules and policies of the SSOs may lose an opportunity to keep-up with the changing business and other needs and such "not-a-state-of-the-art" type rules and polices may risk the very existence of SSOs.