RESEARCH PAPERS

21

IPR MISUSE: THE CORE ISSUE IN STANDARDS AND PATENTS

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JUNE 2009

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TABLE OF CONTENTS

ABBREVIATIONS

ANSI	American National Standards Institute
CEN	European Committee for Standardization
DOJ	Department of Justice
EC	European Commission
ECIS	European Committee for Interoperable Systems
EFD	Essential Facilities Doctrine
EPO	European Patent Office
ETSI	European Telecommunications Standards Institute
FRAND	Fair, Reasonable and Non-Discriminatory
FTC	Federal Trade Commission
GSC	Global Standards Collaboration
GPA	Government Procurement Agreement
GPL	General Public License
ICT	Information and Communication Technology
IEC	International Electrotechnical Commission
IPR	Intellectual Property Right
ISO	International Standardization Organization
ITU	International Telecommunication Union
ITU-T	Telecommunication Standardization Bureau of the ITU
IEEE	Institute of Electrical and Electronics Engineers
JEDEC	Joint Electron Device Engineering Council
JFTC	Japan Fair Trade Commission
JISC	Japanese Industrial Standards Committee
OECD	Organization for Economic Cooperation and Development
OEM	Original Equipment Manufacture
RAND	Reasonable and Non-discriminatory
RF	Royalty Free
TSB	Telecommunication Standardization Bureau
SCP	Standing Committee of the Law of Patents of the World Intellectual Property Organization
SSO	Standard setting organisation
TBT	Committee of Technical Barrier to Trade
TRIPS	Trade Related Intellectual Property Rights
UNCTAD	United Nations Conference on Trade and Development

USPTO	U.S. Patent and Trade Mark Office
VITA	VMEbus International Trade Association
WIPO	World Intellectual Property Organization
WTO	World Trade Organization
W3C	World Wide Web Consortium

EXECUTIVE SUMMARY

Standards cover nearly all fields, including pharmaceuticals, food production, the environment, energy, information and telecommunications. Most are *de jure* and are set by standard setting organizations (SSOs). Those not set by SSOs can be so widely accepted in markets that they become *de facto* standards. Standards can be either mandatory or voluntary. While mandatory standards generally pertain to health, safety or the environment and are enforced by government agencies, most standards are voluntarily implemented.

Due to rapid technical change and the highly profiled intellectual property right (IPR) protection regime, standards are complicated with IPRs, mainly patents and sometimes software copyrights and trade secrets. A "fundamental dilemma" has long been recognized between standardization and IPR.[1] While IPRs are destined for private and exclusive use, standards are intended for "common use"[2] which should therefore be accessible to the public at reasonably low costs. Problems arise when IPRs are included in standards and a balance cannot be struck between the private interests of IPR owners and the integrity of standardization. While private interests of IPR owners are overly protected by IPR laws, there are insufficient governance mechanisms and policies to ensure the integrity of standardization. This imbalance tends to lead to IPR misuse[3] through various means such as refusal to license and the demand of exorbitant royalties not ascribable to the intrinsic technical value.

IPR misuse in standards may cause great difficulties for manufacturers implementing standards. For example, there are hundreds of patents included in MPEG-2, an international standard for visual and audio compression widely used for DVD machines and other multi-media products. High royalties demanded by patent owners have been squeezing the profit margin of DVD manufacturers so low that many manufacturers have stopped producing DVD machines and some have gone bankrupt.[4] Worse, refusal to license IPR covering key interface technologies in standards could enable the IPR owner to leverage its monopoly from one market into another. WINDOWS is a *de facto* standard for operating systems. A refusal by Microsoft to license interface information has been causing difficulties for other IT companies when developing products compatible with WINDOWS. Consumers are forced to use Microsoft products no matter if they are technically superior or not. In both examples, the consumers end up with fewer choices, higher prices and inferior quality.

Standardization organizations such as the International Telecommunication Union (ITU), International Standardization Organization (ISO) and International Electrotechnical Commission (IEC) have attempted to address the above situations by putting in place patent policies which require members to disclose IPR information and to commit to negotiating licensing terms in a Reasonable and Non-Discriminatory manner (RAND)[5]. Meanwhile, competition authorities in developed countries have also identified some anti-competitive practices and have provided relevant remedies. However, the scope and impact of these policies are substantially limited. The patent policies of SSOs are too

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[1] For the early literature, see, for example, Mark Shurmer and Gary Lea, "Standardization and Intellectual Property Rights: A Fundamental Dilemma?" *Standard View*, Vol. 3, No.2, June/1995.

[2] Art. 3.1 of ISO/IEC Directive Part 2, "Rules for the Structure and Drafting of International Standards", available at http://www.iso.org/iso/standards_development/processes_and_procedures/iso_iec_directives_and_iso_supplement.htm (accessed: March 13, 2009).

[3] In this paper, the term "IPR misuse" does not necessarily follow the strict legal definition in western jurisprudence. The reason is that "IPR misuse" and other relevant terms such as "IPR abuses" have been defined in a strong IPR protection context and are therefore not necessarily reliable for the authors.

[4] For further information regarding this particular case or other cases, please refer to Ying Zhan and Xuezhong Zhu, "Intellectual Property Right Abuses in the Patent Licensing of Technology Standards from Developed Countries to Developing Countries: A Study of Some Typical Cases from China", *The Journal of World Intellectual Property,* Volume 10, Numbers 3-4, July 2007.

[5] Occasionally the acronym, Fair, Reasonable and Non-Discriminatory (FRAND) is used instead of RAND.

vague and easily circumvented by the IPR owners. While competition authorities in developed countries are interested in maintaining fair competition in domestic markets, trade authorities may wish to secure an international advantage for their firms by pushing for higher levels of IPR protection. When developing countries began participating in standardization, mainly by manufacturing products in line with international standards, developed countries were trapped in the policy dilemma between IPR protection and the control on IPR misuse and in some cases, were hesitant to pursue effective solutions.

Patent hold-ups, royalty stacking[6] and refusal to license are the major sources of problems with regards to IPR in standards, and, as a result, many markets have been substantially infected with IPR misuse. Therefore, even though the correct policy for IPR in standards is to ensure a balance between IPR protection and the integrity of standardization, currently, the essential task should be focused on regulating IPR misuse in standardization.

This paper illuminates the manipulation on the part of IPR holders in the context of standardization resulting in a severely distorted market. It further examines the limits and failure of current 'solutions' related to the exclusionary effects of IPRs in international standards and attempts to expound the importance of this theme around the following questions:

1. How could the existing IPR information disclosure policy be improved so that it is practically reliable?
2. While RAND has been proposed as a principle, who defines what a ‘reasonable’ cost is and how?
3. What should government agencies do in order to mitigate or eliminate IPR misuses in standardization?
4. What strategic considerations are needed to carry this issue forward in international negotiations?

To address the above questions, this paper provides policy recommendations as follows:

1. Strengthen the *ex ante* disclosure mechanism by providing detailed clarifications on what, who, when and how to disclose IPR information. Further, lay down clearly defined and meaningful remedies for failure to fulfil disclosure obligations.
2. Implement a workable RAND licensing model by requiring mandatory unilateral *ex ante* disclosure of maximum royalty rates and legalizing joint competitive discussions on licensing terms in SSOs.
3. Utilize TRIPS flexibilities on exceptions for patentable subject matters and exemptions and limitations on exclusive rights to ensure interoperability and to facilitate legitimate social and economic development objectives.
4. Develop regulations to control anti-competitive practices such as deceptive conduct coupled with patent ambush, pricing cartels and tying in patent pools. Invoke, in certain circumstances, compulsory licensing to remedy refusal to license.
5. Mandate open standards policy in government procurement and provide government support to open source software to counter balance proprietary standards.

While the above initiatives could be taken at both national and international levels, international initiatives should be given priority. Domestic coordination and collective actions among the South need to be ensured.

[6] In a legal context royalty stacking (i.e. multiple royalties that must be paid to implement one standard) is not necessarily in itself an IPR misuse. However, royalty stacking has indeed been a big problem for standards implementation.

I. INTRODUCTION

Approximately thirty years ago, most standards were based on publicly available technologies. When a patent did exist, by the time the relevant standards had been drafted, the valid period of the patent had already expired. Currently, most standards are covered by IPRs still under protection. Grave concerns have arisen regarding the problematic combination of IPR and standards.

International standardization organizations and competition authorities in some countries have been trying to address these concerns. Some progress has been achieved and 'solutions' provided. However, in practice, it has turned out that current 'solutions' are substantially limited and cannot efficiently address the problems arising from the combination of IPR and standards. When developing countries started to manufacture and export standardized products and consequently developed countries began to rely on licensing IPR to developing countries, this original fair competition issue in developed countries began to have an impact on South-North trade. Developing countries have begun to request that relevant international organizations such as the World Intellectual Property Organization (WIPO) address the issue.

This paper is designed to provide developing countries with some policy recommendations for actions within WIPO and other fora on the issue of IPR in standardization. For this purpose, the paper is organized as follows: Following the Introduction in Chapter I**,** Chapter II explains why IPR misuse is the core issue in IPR in standards. Chapter III examines current 'solutions' and shows why they are inadequate in addressing the issue of IPR in standards. The adverse effect of current 'solutions' is also revealed in this chapter. Chapter IV offers solutions for IPR misuse in standardization from the perspective of developing countries by recommending policies from both an international and national dimension. Chapter V concludes by summing up the key ideas of this paper.

II. ISSUE AT STAKE: WHAT IS THE INTERFACE BETWEEN IP AND STANDARDS?

II.1 Definitions: Standards, IPR and IPR in Standards

Standards are usually known as sets of fairly complex technical documents to which only relevant technicians, product designers, certain industrial regulators and government officials pay attention. Today, standards have become much more than just long, complex documents. They can act as global unifiers that are often used as political, social, economic, and trade tools. This is especially true for Information and Communication Technology (ICT) standards which ensure the interoperability of information systems. Ideally, standards should serve as a safeguard device for ensuring that technologies can be used seamlessly, inexpensively, and without unnecessary limitations by all.

At a policy level, standards are employed for regulatory and development purposes. Standards can determine how a country can help industries grow and compete in the global market, and how their population can share in and contribute to technological progress. Additionally, standards can have a significant impact on how a country designs an innovation-friendly environment where all stakeholders can contribute to and share technological progress. Standards are also important to facilitate delivery of government information and social services to the public. At a business level, standards are important business strategic tools which could mean the life or death of corporate empires.[7]

IPRs cover all forms of knowledge, the commercial exploitation of which is protected through patents, copyrights, industrial designs, trademarks, layout protection and other forms. The economic rationale behind the patent system is twofold: promoting innovation in new and emerging fields of technologies by providing incentives for innovation as well as disseminating technology through disclosure of the invention. The patent system also functions as 'notice' to competitors of the existence of exclusive rights over a subject matter and boundaries covered by the grant of the patent. The WTO Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) currently lays down minimum standards to which member states must comply.[8] TRIPS significantly altered the policy space that nations enjoyed in the protection and enforcement of IPRs and has been criticized for its detriment to development. Under the current IPR regime, it is highly controversial whether an unreasonably high level of IPR protection may in effect impede innovation.[9]

Today, it is increasingly clear that inclusion of IPR in standards is unavoidable.[10] Serious problems often arise when standards and IPRs are combined. Both standards and IPRs are empowered by the government to promote specific policy objectives that are intended to be beneficial to the public. It is understood that IPRs are intended to stimulate innovation, public disclosure and use by granting a limited right of exclusivity to the holder while standards are intended to promote public

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[7] As commented in an *Economist* article, "The noisiest of those competitive battles will be about standards. The eyes of most sane people tend to glaze over at the very mention of technical standards. But in the computer industry, new standards can be the source of enormous wealth, or the death of corporate empires. With so much at stake, standards arouse violent passions." 'Do it my way (technical standards in the computer industry)', *The Economist* (US), 27 February 1993.

[8] The Agreement on Trade Related Aspects of Intellectual Property Rights (15 April 1994) LT/UR/A-1C/IP/1, available at http://www.wto.org/english/docs_e/legal_e/27-trips.pdf (accessed: Feb. 28, 2009).

[9] Michael Heller, "Innovation Gridlock: Today's inventors need to put together many bits of intellectual property. Too bad they are all patented", *Newsweek,* Feb. 2, 2009. See also Michael Heller and Rebecca Eisenberg, "Can Patents Deter Innovation? The Anticommons in Biomedical Research", *Science*, New Series, Vol.280, No.5364, May 1, 1998.

[10] Government of China, "Background Paper to Chinese submission to WTO on the Intellectual Property Rights (IPRs) Issues in Standardization (G/TBT/W/251/Add.1, 9 November 2009)", available at www.wto.org (accessed: April 23, 2009).

interest by enabling widespread adoption - both IPRs and standards encourage the sharing of inventions. In other words, governments grant IPRs to encourage innovation and the consequent sharing of that innovation with others. Standards, too, are a sort of government grant in the sense that governments give members of SSOs the privilege of working together and in cooperation to encourage innovation and competition, in addition to coordination of their own interests and positions. Without this government grant, standardization activities might be considered anti-competitive and subject to antitrust accusations.[11]

A balance between the private interests of IPR owners and the interest of the public should be embodied in standardization. However, the problem of balancing these two types of interests is by no means simple and often leads to complex and serious problems. During the development stage of standards, corporate entities push hard to have IPRs included in the standards because ownership of IPRs covering a standard can confer huge financial benefits as well as other market advantages. The first benefit for an entity is the gaining of significant market share by being the first to market with a standards implementation or by having tacit knowledge not available to other standards implementers. Secondly, IPRs are often unknown to SSOs and standards implementers, and IPR royalties are undefined before the standard is adopted. This situation provides an IPR owner with the opportunity to engage in 'patent ambush' by empowering the IPR owner to demand exorbitant royalties from implementers of the standards who have no alternative but to yield to the IPR owner's demand if the implementers wish to implement the standard. Thirdly, if the IPR covers key interface technologies which are indispensable for producing compatible products, refusal to license these key interface technologies by the IPR owner to producers of compatible products may lead to severe monopoly problems.[12] The competitive advantage for the IPR owner is well deserved if it is attributable to superior technologies and fair dealing which does not involve leveraging uncompetitive situations to extract exorbitant or supra-competitive royalties.

II.2 Core Issue in IPR in Standardization: Anti-competitiveness of IPR Misuse in Standards

Once it is clear that the combination of IPR and standards is unavoidable, the correct solution for problems arising from this combination should be to strike a balance between IPR protection, to ensure legitimate private interests of IPR owners, and the integrity of standardization to ensure public interests. In practice, it can be confirmed that IPR misuse is the main source of conflict.

Standards competition has been increasingly intensified in the knowledge economy. This is especially true in ICT standards which are characterised by a strong network effect. Network effect means that the value of a network is positively related to the number of the users who subscribe to that network. The more users, the higher the value of a network.[13] Once a network or a standard has gained a critical mass of users, switching to another would incur great cost. Thus, users and the whole society are locked into this network or standard. For example, WINDOWS currently prevails in the desktop operating system market mainly because of its success in attracting more users rather than in its technical superiority. Since users have already been locked in by WINDOWS, switching to the newly

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[11] Jointly setting standards by members who are often competitors could be considered a cartel and would warrant anti-trust scrutiny. However, standardization is mostly entrusted by governments (especially when done by SSOs) and is normally exempted from anti-trust scrutiny in national competition laws such as the *German Act against Restraint of Competition*: § 2. Section 1.

[12] The situation where IPR in standards may lead to a monopoly position is not only limited to IPR in key interface technologies. Once the technology is chosen for the mandatory standard, it does not matter whether it is key interface technology or not since companies still need to obtain that IPR in order to implement the mandatory standards. However, in accordance with current experience, especially the 2004 Microsoft case, this paper will focus on interface technologies when discussing refusal to license IPR in standards.

[13] For the economics of network effect, please refer to Michael Katz, and Carl Shapiro, "Network externalities, Competition, and Compatibility", *The American Economic Review*, Vol. 75, No. 3, June 1985. Also, Nicholas Economides, "The Economics of Networks", *International Journal of Industrial Organization*, Vol. 14, No. 6, 1996.

developed Linux systems would incur huge costs even though Linux has much merit. Therefore, it is relatively easy for WINDOWS to continue with its market dominance by taking advantage of network effect.

Companies normally control standards by including their IPR in the standards. Therefore, tempted by market advantage based on network effect, companies compete fiercely to include their IPR into the standards. These companies stealthily hide their IPR ownership (generally in the form of patents or pending patent applications) while promoting inclusion of the technology covered by the patents or patent applications in a standard. Once a standard has been adopted and widely implemented, these IP holders then claim their rights, usually demanding large royalties. This is known as 'patent-ambush'. Injunctions would put a stop to manufacturing processes while law suits are filed, decided, appealed, and then decided again. This trend is called 'patent hold-up'. Patent hold-ups raise the risk of implementing a standard, since royalty costs could suddenly exceed estimated fees or competitive market rates after significant investments in technology development, deployment, and sales have been achieved. This risk is further increased when 'patent thickets' come into play.[14] In this situation, multiple patents within a standard exist, often unknowingly, until the standard is widely adopted and IPR owners come to the surface for IPR claims. In such cases, which result in 'royalty stacking', the total amount of royalties that must be paid to implement the standard can easily exceed the price point at which a product based on that standard can be sold.[15] A good example of patent hold-up and royalty stacking is found in the patents covered by the international standard MPEG-2. In the MPEG-2 case, while the international standard is complicated with hundred of patents, only a part of them had been disclosed by the IPR owners during the process of standard setting. Theoretically, standard implementers may discover other patents through patent searches. However, in practice, it is impossible to exhaust all patents included by that standard due to technical complexities and uncertainties around patent right interpretation. Therefore, there are always large numbers of new patents coming out with royalty demands during the process of standard implementation in, for example, the production of DVD machines. Aside from that, royalties are demanded separately by different IPR owners and/or groups of IPR owners. Philips, Sony and Pioneer have formed the patent pool of "3C". Hitachi, Panasonic, JCC, Mitsubishi, Toshiba and Time-Warner have formed the patent pool of "6C". Standards implementers must negotiate royalties independently with those patent pools and other individual companies, such as Thompson, who have not joined the patent pools, in order to implement the standards. The aggregated royalties demanded by those patent pools and individual IPR owners have driven many DVD machine producers into an extremely difficult situation. Patents related to the third generation (3G) mobile standards are facing similar difficulties.[16]

Aside from hold-up and royalty stacking, refusal to license IPRs key to the standard will cause more severe problems such as leveraging the monopoly in one market into other market(s). For example, in EC Microsoft case, the EC competition authority decided that by refusing to license WINDOWS interface information to server producers, Microsoft extended its monopoly in operating systems to the server market and therefore violated the competition law.[17]

Patent hold-ups, royalty stacking and refusal to license are the major source of problems with regards to IPR in standards and are flooded with practices of IPR misuse. Therefore, even though the correct policy for IPR in standards is to ensure a balance between IPR protection and the integrity of standardization, currently, the essential task is to regulate IPR misuse in standardization.

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[14] According to Carl Shapiro, a "patent thicket" is a "dense web of overlapping intellectual property rights that a company must hack its way through in order to actually commercialize new technology." Carl Shapiro, "Navigating the Patent Thicket: Cross-Licenses, Patent Pools, and Standard Settings," in *Innovation Policy and the Economy 1*, Adam Jaffe et al. (eds.), The MIT Press, Cambridge, Massachusetts, London, England, 2001.

[15] Mark Lemley and Carl Shapiro, "Patent Hold-up and Royalty Stacking", *Texas Law Review*, Vol. 85:1991, 2007.

[16] Ibid.

[17] European Commission: COMMISSION DECISION of 24.03.2004 relating to a proceeding under Article 82 of the EC Treaty. (Case COMP/C-3/37.792 Microsoft), available at http://ec.europa.eu/competition/antitrust/cases/decisions/37792/en.pdf (accessed: March 14, 2009).

II.3 Development Implications of the Issue of IPRs in Standardization

Developing countries have long been greatly disadvantaged in standardization. They seldom have substantial participation and influence in international standardization activities. Therefore, the compositions of technical standards as well as the amount to be charged for the IPR, if the components of standards are covered by IPR, are substantially decided by developed countries.

The issue of IPR in standards was less contentious in the past. Standards were mostly created by developed countries and multinational corporations which shared similar patterns in business and international trade and were relatively at the same level of technology development. These organisations designed processes and rules for standard setting to favour their preferred methods of cooperation and negotiation. Even more importantly, they had large IPR portfolios and could make cross-licensing agreements which essentially nullified royalties and applied the same conditions to all parties. When all parties in a negotiation owned relatively symmetric resources and influence, a fair and workable playing field was easier to achieve. If there were disputes, parties could opt to reach settlements through such means as cross-licensing.[18] However, as competition in standards became increasingly fierce, this 'unwritten code of ethics' or 'gentlemen's agreement'[19] was broken and standardization became flooded with practices of IPR misuse.

IPR misuse in standardization became complicated once developing countries began to participate in standardization, mainly by manufacturing products in line with those standards. The victims of IPR misuse have often been manufacturing enterprises in developing countries. Due to this situation, policy progress in developed countries on regulating IPR misuse has become less and less active and more biased in favour of IPR protection. For example, patent pools are treated more leniently and are normally exempted from anti-trust scrutiny since, instead of a market tool for cross-licensing, many times patent pools have become a tool to sell IPRs owned by multinational firms to manufacturers in developing countries in a collective manner.

The issue of IPR in standardization, or IPR misuse, is extremely harmful to developing countries. The access of developing countries to technology - and thus their access to the world - is greatly undermined by their limited capacity to meet the royalties and other licensing terms encumbered in standards. This causes tremendous difficulties for developing countries to make products in line with those standards. It also affects a government's ability to use technology to provide access to knowledge, deliver social services, and bring progress to its society. Therefore, when IPR is incorporated in standards without appropriate safeguards against IPR misuse, it can further isolate these developing countries from interconnecting with the rest of the world - a situation that can negatively impact their social and intellectual growth along with their economic prosperity. Therefore, IPR in standardization has currently evolved from a mainly competition issue in developed countries into a global issue with profound and complicated North-South implications.

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[18] Richard Raysman and Peter Brown, "Patent Cross-licensing in the Computer and Software Industry", *New York Law Journal*, Vol. 233—No.7, Tuesday, January 11, 2005.

[19] See, for example, the 'gentlemen's agreement' on licensing issues in GSM network discussed in Rudi Bekkers, Geet Duysters and Bart Verspagen, "Intellectual Property Rights, Strategic Technology Agreements and Market Structure", Research Policy 31 (7), 2002. See also the 'nonaggression' or 'mutual forbearance' where companies such as Oracle did not patent aggressively in the hope that others would follow suit. It is commented that "when lead time advantages are significant and patent standards are high, firms pursue strategies of 'mutual non-aggression.' Then R&D incentives are stronger, even optimal." James Bessen, "Patent Thickets: Strategic Patenting of Complex Technologies", March 2003, available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=327760 (accessed: April 23, 2009).

III. THE FAILURE OF CURRENT 'SOLUTIONS' FOR IPRS IN STANDARDIZATION

Problems arising from the combinations of IPRs and standards have been to some extent recognized, and currently various policy models have been designed to address these problems at both international and national level. The basis of these policies includes the requirement of IPR information disclosure to the SSOs and the requirements of the RAND licensing principle to which IPR owners should commit if they want their IPRs to be included in the standards. These principles are indeed important and necessary in resolving problems arising in IPR in standards, especially IPR misuse. However, in practice, these policies are too vague and therefore have not only failed to effectively address problems in IPR in standards, but may have perpetuated them.

III.1 International Dimensions: ITU-T/ISO/IEC, WTO, and WIPO

The issue of IPR in standardization is by all means a global issue. International efforts should be secured in order to address this issue efficiently. Relevant international organizations, especially those for standardization, IPR and trade should take due responsibilities to resolve the problems. However, currently, those organizations have either taken little action or their policies are so substantially limited that they serve no meaningful purpose.

III.1.1 Limits of the Common Patent Policy of International Standardization Organizations (ITU-T, ISO and IEC)

International standards development organizations such as the Telecommunication Standardization Sector of the International Telecommunication Union (ITU-T), International Standardization Organization (ISO) and International Electrotechnical commission (IEC) established patent policies for standardization decades ago. These policies laid down the fundamentals widely recognized According to these policies, IPR owners who were at the same time members of the above standards development organizations were required to disclose to the SSOs information related to their IPR that could be included in the standards being developed by those SSOs. IPR owners were also required to commit to licensing their IPR to potential standards implementers on either a royalty free basis or RAND terms. However, serious weaknesses in these policies have been recognized. For example, though disclosure duties have been laid down, there is no sufficient mechanism or governance model to ensure its compliant implementation. With regard to licensing terms, IPR owners seldom commit to royalty free. RAND is also too vague and therefore subject to arbitrary interpretations in patent disputes. In addition, IPR owners do not disclose their terms to other licensees, and therefore it can hardly be confirmed whether licensing has been done on non-discriminatory terms. There is an obvious need to make these policies more clear, transparent and actionable. In 2007, the above three standardization bodies harmonized their policies into one common patent policy.[20] In order to "clarify and facilitate implementation of the Patent Policy", an implementation Guideline was also published.[21]

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[20] ITU-T/ITU-R/ISO/IEC, "Common Patent Policy for ITU-T/ITU-R/ISO/IEC", available at www.itu.int/ITU-T/dbase/patent/patent-policy.html (accessed: Feb. 28, 2009). The text of this policy is as follows:

"Common Patent Policy for ITU-T/ITU-R/ISO/IEC

The following is a "code of practice" regarding patents covering, in varying degrees, the subject matters of ITU-T Recommendations, ITU-R Recommendations, ISO deliverables and IEC deliverables (for the purpose of this document, ITU-T and ITU-R Recommendations are referred to as “Recommendations”, ISO deliverables and IEC deliverables are referred to as “Deliverables”). The rules of the "code of practice" are simple and straightforward.

However, though there have been some improvements, this new policy remains fundamentally the same as that in previous patent policies before harmonization. This policy is still far from meeting with practical needs in standards setting or standards implementation. With regard to IPR information disclosure, the new policy merely states that "it is desirable that the fullest available information should be disclosed. Therefore, any party participating in the work of ITU, ISO or IEC should, from the outset, draw the attention of the Director of ITU-TSB, the Director of ITU-BR, or the offices of the CEOs of ISO or IEC, respectively, to any known patent or to any known pending patent application, either their own or of other organizations, although ITU, ISO or IEC are unable to verify the validity of any such information."[22] It is obvious that the duty of IPR information disclosure has not been clearly defined as for who, when and how to disclose the IPR information. In practice, the disclosed IPR information is far from reliable for the purpose of standards implementation. For example, patent searches in the data base in ITU and patent pools will find that the patents listed for the implementation of the international standard MPEG-2 in ITU[23] are far less comprehensive and important compared to those listed in one patent pool MPEG-LA for commercial licensing in implementing that standard.[24] It should be noted that there are other patent pools and individual IPR owners who have more patents needed in the implementation of MPEG-2 standard. Therefore,

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Recommendations | Deliverables are drawn up by technical and not patent experts; thus, they may not necessarily be very familiar with the complex international legal situation of intellectual property rights such as patents, etc.
Recommendations | Deliverables are non-binding; their objective is to ensure compatibility of technologies and systems on a worldwide basis. To meet this objective, which is in the common interests of all those participating, it must be ensured that Recommendations | Deliverables, their applications, use, etc. are accessible to everybody.

It follows, therefore, that a patent embodied fully or partly in a Recommendation | Deliverable must be accessible to everybody without undue constraints. To meet this requirement in general is the sole objective of the code of practice. The detailed arrangements arising from patents (licensing, royalties, etc.) are left to the parties concerned, as these arrangements might differ from case to case.

This code of practice may be summarized as follows:

1 The ITU Telecommunication Standardization Bureau (TSB), the ITU Radiocommunication Bureau (BR) and the offices of the CEOs of ISO and IEC are not in a position to give authoritative or comprehensive information about evidence, validity or scope of patents or similar rights, but it is desirable that the fullest available information should be disclosed. Therefore, any party participating in the work of ITU, ISO or IEC should, from the outset, draw the attention of the Director of ITU-TSB, the Director of ITU-BR, or the offices of the CEOs of ISO or IEC, respectively, to any known patent or to any known pending patent application, either their own or of other organizations, although ITU, ISO or IEC are unable to verify the validity of any such information.

2 If a Recommendation Deliverable is developed and such information as referred to in paragraph 1 has been disclosed, three different situations may arise:

> 2.1 The patent holder is willing to negotiate licences free of charge with other parties on a non-discriminatory basis on reasonable terms and conditions. Such negotiations are left to the parties concerned and are performed outside ITU-T/ITU-R/ISO/IEC.
>
> 2.2 The patent holder is willing to negotiate licences with other parties on a non-discriminatory basis on reasonable terms and conditions. Such negotiations are left to the parties concerned and are performed outside ITU-T/ITU-R/ISO/IEC.
>
> 2.3 The patent holder is not willing to comply with the provisions of either paragraph 2.1 or paragraph 2.2; in such case, the Recommendation | Deliverable shall not include provisions depending on the patent.

3 Whatever case applies (2.1, 2.2 or 2.3); the patent holder has to provide a written statement to be filed at ITU-TSB, ITU-BR or the offices of the CEOs of ISO or IEC, respectively, using the appropriate "Patent Statement and Licensing Declaration" form. This statement must not include additional provisions, conditions, or any other exclusion clauses in excess of what is provided for each case in the corresponding boxes of the form".

[21] The Implementation Guideline of the Common Policy is available at http://www.itu.int/ITU-T/ipr/ (accessed: Feb. 28, 2009).

[22] Ibid.

[23] ITU Patent Database is available at http://www.itu.int/ipr/IPRSearch.aspx?iprtype=PS (accessed: Feb. 28, 2009).

[24] Patents listed in MAPEG-LA available at http://www.mpegla.com/avc/avc-patentlist.cfm (accessed: Feb. 28, 2009).

manufacturers relying on patent information disclosed in SSOs will run into a swamp of patent hold-ups and royalty stacking.

With regard to licensing terms, the Common Patent Policy still relies on the vague RAND. There is still no hope of resolving the arbitrary definition of RAND in those organizations since this issue is understandably avoided by declaring that "[if] the patent holder is willing to negotiate licences free of charge with other parties on a non-discriminatory basis on reasonable terms and conditions, [S]uch negotiations are left to the parties concerned and are performed outside ITU-T/ITU-R/ISO/IEC."[25] If the IPR owner accepts neither royalty free nor RAND, the reaction of those standards organizations is to exclude "provisions depending on the patent" in their standards.[26] In practice, this means the standards could either be revised so as to avoid that patent, or be dropped if the patent is by no means avoidable. Even if IPR owners accept RAND, there are still tremendous problems since RAND is too vague and subject to arbitrary interpretation by the IPR owners. This situation is exacerbated by the fact that licenses are usually confidential and it is hard to ensure that patent owners are complying with their RAND commitments. Though standards have been set and patent policies, including licensing terms seem to have been addressed in SSOs, the implementation of these standards is hampered by the licensing disputes.

Currently, details on the clarification of the operation of this common patent policy are still under discussion in an *ad hoc* IPR work group in ITU-T. However, these discussions are dominated by multinational firms with fundamentally conflicting positions. Therefore, it is very hard to attain meaningful progress in the improvements on this common patent policy, even though substantive discussions have been made.[27]/[28]

III.1.2 Blocked Discussions in the World Trade Organization (WTO)

The WTO requires Members to adopt international standards in order to facilitate trade.[29] However, if the patent policies for international standards are not well established, problems will arise when Members adopt the international standards. Standards implementation is complicated with and impeded by patent infringements litigation and counter claims of anti-trust on exorbitant royalties. For example, even though the ITU had already started its efforts on the third generation mobile technologies, it was only in 2004 that the commercialization of those standards began.[30] For developing countries, patent disputes in some cases might bring the implementation of these standards to a halt since these countries could neither afford the exorbitant royalties nor costly litigation. If standards were adopted as the basis of technical regulations, a developing country would be placed in

[25] ITU-T/ITU-R/ISO/IEC, supra note 21.
[26] Ibid.
[27] For information of those discussions, please refer to the web site of the ITU's TSB Director's *Ad Hoc* Group on IPR at http://www.itu.int/ITU-T/othergroups/ipr-adhoc/index.html (accessed: Feb. 28, 2009).
[28] While this paper makes an attempt to identify all problems related to IPR in standards in the context of standards, development and standards implementation, it should be noted that international standardization organizations are not responsible for the existence of all the problems, nor are they responsible for the solutions to all the problems.
Some of the problems are difficult issues in themselves. For example, while it is a legitimate request for parties to keep licensing terms confidential, it is hard to examine whether non-discriminatory commitment has been fulfilled or not. Accordingly, some problems may have gone beyond the mandates of the international standardization organization. By their own mandate, international standardization organizations focus on technical aspects of standardization. There may be inherent limits in their mandate and in their expertise with regards to the public aspects of IPR in standards, which is complicated with IPR, competition and other regulatory complexities. However, it would be desirable for international standardization organizations to exploit their potentials within the current mandate. It would also be helpful if they could explore cooperative mechanisms with other organizations with better expertise and more relevancies to public policy aspects of IPR in standards.
[29] Art. 2.4 of WTO/TBT Agreement.
[30] WTO, "World Trade Organization's 2005 World Trade Report: Exploring the links between trade, standards and the WTO", available at http://www.wto.org/english/news_e/pres05_e/pr411_e.htm (accessed: Feb. 28, 2009).

an awkward position with regard to the fulfilment of WTO obligations to adopt international standards. Therefore, in 2005, China requested the WTO to find a way out of this situation.[31]

The U.S. strongly opposed the Chinese submission on this issue with the argument that WTO/TBT is irrelevant to the issue of IPR in standardization. The opposition went further by arguing that in the case of policy clarification, discussions should be taken up by international standardization organizations. At the meeting at the end of 2006 which intended to adopt the report of the TBT discussions, this issue almost paralysed the adoption of the report. China, with the support of Brazil, insisted on the inclusion of IPR and standardization in the report with both countries blocking adoption of the report if this did not occur. In response, the U.S., along with Mexico, responded with the clear position that if this issue were to be included, the situation would likewise result in the blocking of the report. In the end a compromise was reached where this issue was not mentioned in the main text but was referred to in the footnote and Annex of the report.[32] Since this meeting, the issue has not been discussed again at the WTO.

Further to the Chinese proposal on IPR in standardization above, Denmark raised essentially the same issue in its notification to the WTO on mandatory open standards policy in October 2007.[33] In accordance with the notification rules of the TBT Agreement, only mandatory national standards which deviate from international standards are to be notified to the WTO[34] and, by notifying the WTO under the auspices of the TBT Agreement, the Danish government assumed that this mandatory open standards policy would not be recognised as consistent with the TBT Agreement unless legitimate reasons for deviations from international standards were provided. The legitimate reason provided by the Danish government was interoperability. While in previous experience, legitimate reasons for deviations from international standards have included "national security requirements; the prevention of deceptive practices; protection of human health or safety, animal or plant life or health, or the environment",[35] interoperability was for the first time invoked by Denmark as the legitimate objective for deviations from international standards. This was new and strange to most WTO negotiators. However, interoperability had already gained world wide acceptance. Accordingly, would WTO rules be interpreted to include interoperability as one of the legitimate objectives for deviations from international standards? Until the present, no member has made any official comment on this point.

The important implication of the Denmark mandatory open standards notification is whether interoperability could be interpreted as one of the legitimate objectives for deviations from WTO obligation on adopting international standards. While in the Denmark notification and relevant official document,[36] the term IPR has been discretely avoided, in effect, with regard to licensing terms of IPR in standards, the term 'open standards' itself has almost the same implication with that contained in the issue of IPR in standardization.

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[31] Government of China, "Intellectual Property Right (IPRs) Issues in Standardization, Communication from the People's Republic of China, (G/TBT/W/251, 25 May 2005)", available at www.wto.org (accessed: April 23, 2009). ("IPR issues in preparing and adopting international standards have become an obstacle for Members to adopt international standards and facilitate international trade. It is necessary for the WTO to consider negative impacts of this issue on multilateral trade and explore appropriate trade policies to resolve difficulties arising from this issue.").

[32] WTO: "Fourth Triennial Review of the Operation and Implementation of the Agreement on Technical Barriers to Trade under Article 15.4", (G/TBT/19), 14 November 2006.

[33] Denmark notification to WTO on mandatory open standard policy (G/TBT/N/DNK/73, 4 December 2007), available at www.wto.org (accessed: March 15, 2009).

[34] Art. 2.9 of WTO/TBT Agreement.

[35] Art. 2.2 of WTO/TBT Agreement.

[36] For example, Danish Government, "Agreement on the use of open standards for software in the public sector" and other documents, available at http://en.itst.dk/the-governments-it-and-telecommunications-policy/open-standards (accessed: Feb. 28, 2009).

III.1.3 A New Issue Addressed at the World Intellectual Property Organization (WIPO)

The controversy of IPR and standards has also caught the attention of Members at the World Intellectual Property Organization (WIPO). Proposals related to IPR in ICT standardization such as 'open licenses' and 'free software' were made by Chile in 2006 under the Development Agenda.[37] In the Report of International Patent System prepared by WIPO Secretariat, the issue of standards and IPR was identified with extensive elaboration as one of the "issues that are particularly relevant to broader policy considerations and development concerns."[38] On June 23-27 2008, the twelfth Session of the Standing Committee of the Law of Patents (SCP) asked the WIPO Secretariat to undertake preliminary studies on "patents and standards" as one of four issues out of a list of eighteen issues for the 13th Session of the SCP to be held March 23-27, 2009. The preliminary study on this issue has been recently released.[39] As the study contains neither a conclusion nor policy recommendation, it is up to the Members to present comments and initiatives for solutions to the issue of IPR in standardization.

III.2 National Dimensions

III.2.1 Current Policies and Practices in Developed Countries: A Policy Dilemma between IPR Protection and Control of IPR Misuse

For developed countries, IPR misuse in standardization has been a source of great policy concern with regard to fair competition and interoperability in ICT sectors. SSOs, competition authorities and private firms in developed countries have been trying to address this issue through various means such as strengthening SSOs' patent policies, controlling IPR misuse in standardization with competition policies, implementing open standards policies and promoting open source software. The following five sections (a – e) explain and analyse the current progress and limiting factors on this issue:

(a) Patent Policies of SSOs

Most SSOs in the ICT sectors of developed countries have published their patent policies and generally these policies are more or less the same as the Common Patent Policy for ITU-T/ITU-R/ISO/IEC. Hence they also contain the same weakness.[40] While SSOs in developed countries try hard to improve their patent policies, their endeavours must confront various constraints. Firstly, SSOs face anti-trust risks. For example, in the Allied Tube case, it was decided by the U.S. Supreme court that firms entering into collusion and voting against a standard proposed by competing firms was a violation of anti-trust law.[41] Anti-trust risk is especially apparent when it comes to joint licensing terms discussions since joint pricing has long been seen as *per se* illegal. SSOs are reluctant to include it in their patent policies in order to avoid anti-trust risks, though it has been recognized that joint discussions on licensing terms could be pro-competitive.[42] Secondly, it is assumed that since most SSOs rely on member fees and some major IPR owners do not like improvements to patent policies,

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[37] WIPO, "Provisional Committee on Proposals Related to a WIPO Development Agenda, First Session, Geneva, February 20 to 24, 2006, Proposal by Chile, January 12, 2006". available at http://www.wipo.int/edocs/mdocs/mdocs/en/pcda_1/pcda_1_2.doc (accessed: May 16, 2009).

[38] WIPO, "The Report of International Patent System prepared by WIPO Secretariat, SCP/12/3, April 15, 2008", available at http://www.wipo.int/meetings/en/details.jsp?meeting_id=15486 (accessed: May 16, 2009).

[39] WIPO, "Standards and Patents prepared by WIPO Secretariat, SCP/13/2, February 18, 2009", available at http://www.wipo.int/meetings/en/doc_details.jsp?doc_id=116812 (accessed: May 16, 2009).

[40] For a general review of SSOs' patent policies, please refer to Mark A. Lemley, "Intellectual Property Rights and Standard-Setting Organizations", 90 *California Law Review*, 1889, December, 2002.

[41] Allied Tube v. Indian Head, Inc., 486 U.S. 492 (1988).

[42] While it is collusion undertaken by SSOs members that runs into anti-competitive conduct, it is not clear to what extent SSOs are to be held responsible for these collusions. Therefore, SSOs are normally reluctant to run into anti-trust disputes on which they do not have expertise, nor do they want their standardization activities to be interrupted by these legal risks.

SSOs are hesitant to make any improvements. For example, the vigorous progress on patent policy of the SSO VMEbus International Trade Association (VITA) annoyed Motorola which consequently withdrew its membership from VITA.[43] Currently, SSOs in developed countries are still improving their patent policies. However, in order to make breakthroughs, they need to be encouraged to be innovative. At the same time, they also need certain antitrust exemptions from competition authorities.

(b) Control of IPR Misuse through Competition Policy

IPR in ICT standardization is closely related to competition policy. Competition authorities in developed countries have paid great attention and made substantial progress on policies related to IPR in standardization. The U.S. Competition authorities, namely the Federal Trade Commission (FTC) and Department of Justice (DOJ), have been very progressive on the policies related to IPR in standardization for a long time. The FTC and DOJ began policy initiatives in the mid 1990s and have jointly held extensive hearings on this issue since then.[44] In its decision on the Dell case in 1996, the FTC made a benchmark contribution by establishing an IPR owner's legally binding duty to disclose IPR information to SSOs.[45] The U.S. Courts also decided that holding back IPR information from SSOs constitutes fraud warranting a remedy of unenforceability of the IPR in scope of standard implementation.[46] Compared with the U.S., Europe has been more progressive on this issue. As early as 1992, the EC had recognized that IPR holders should "make the best efforts to identify any IPR which they hold relevant to a standard under development and to confirm or refuse permission for its incorporation in the standard" and "offer fair, reasonable and non-discriminatory monetary or non-monetary terms for the license to use IPR", as well as "treat their eventual agreement for incorporating an IPR in a standard as irrevocable".[47] In the recent Microsoft case, the EC competition authority decision made a strong statement regarding IPR misuse in ICT standardization. While compulsory licensing has been an extremely thorny issue in jurisprudence in developed countries since 1980s, the EC competition authority bluntly compelled Microsoft to disclose its technical information in the *de facto* standard of WINDOWS operating system, disregarding Microsoft's claim that this information was protected as a business secret.[48]

(c) Relevant Initiatives Taken by the IP Offices

Currently, IPR authorities in some countries have begun to show an interest in the issue of IPR in standardization. IPR authorities in some countries have maintained a patent database and sophisticated patent search tools that are very helpful to improve IPR information for SSOs. This is especially true when taking into consideration that the current disclosure system in SSOs is not working that well. The European Patent Office (EPO) has been active in exploring mechanisms to help solve problems in

[43] It should be noted that in effect this might be a false concern. After Motorola left, more than 20 other members joined VITA. Besides, IPR owners who withdraw from SSOs may severely "handicap" their ability to "participate in business for the technologies they address". Comment made by Michael D. Hartogs, Senior Vice President and Division Counsel at QUALCOMM Technology Licensing at the FTC/DOJ SHERMAN ACT SECTION 2 Joint hearing in 2007. The transcript of this hearing is available at http://www.ftc.gov/os/sectiontwohearings/docs/060912FTC.pdf (accessed: June 8, 2009).

[44] For example, FTC held a hearing on Global and Innovation Based Competition in 1995. The report of that hearing is available at http://www.ftc.gov/bc/tech/standards/index.htm. FTC and DOJ jointly held a hearing on Competition and Intellectual Property Law and Policy in the Knowledge-Based Economy, the report and detailed information is available at http://www.ftc.gov/opp/intellect/index.shtm (accessed: Feb. 28, 2009).

[45] FTC Press Release: November 2, 1995 "Dell computer settles FTC charges; won't enforce patent rights for widely used computer feature", available at http://www.ftc.gov/opa/1995/11/dell.shtm (accessed: Feb. 28, 2009).

[46] See, for example, Rambus v. Infineon Technologies, 318 F.3d 1081 and Qualcomm Incorporated v. Broadcom Corporation, No. 2007-1545 (Fed. Cir. 12/1/2008) (Fed. Cir., 2008).

[47] European Commission, Communication on Intellectual Property Rights and Standardization (COM (92) 445 final, 1992, available at http://ec.europa.eu/enterprise/standards_policy/reference_documents/index.htm (accessed: June 8, 2009).

[48] European Commission, COMMISSION DECISION of 24 May 2004 relating to a proceeding pursuant to Article 82 of the EC Treaty and Article 54 of the EEA Agreement against Microsoft Corporation, 6.2.2007, *Official Journal of the European Union*, L 32/23. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:032:0023:0028:EN:PDF (accessed: Feb. 28, 2009).

IPR in standardization.[49] Concrete policy initiatives are expected from EPO and other IP offices in this regard.

Aside from IPR information, some other issues such as patentability on subject matter, exemptions and limitations to the exclusive rights with regard to IPR also merit policy considerations by IP offices. Until the present, there have been no substantial discussions on these issues in IP offices in developed countries.

(d) Mandatory Open Standards Policy and Open Source Software Initiatives

Some developed countries have been pushing forward the mandatory open standards policy in order to avoid IPR misuse in ICT standardization. Denmark and the Netherlands governments have mandated the use of open standards for software in the public sectors.[50] The exact definition of open standards is still under discussion but it has been widely accepted that open standards should at least mean an open standard developing process and open licensing for an IPR included in the standards. Open licensing is more or less the same as free licensing or RAND.[51] In practice, governments name at their own discretion, a list of standards as open standards for mandatory implementation, as Denmark and the Netherlands have done.

Open source is a new software development and dissemination model which is different from proprietary software. The basic idea of open source is to open the source code to the public for modifications and uses without restriction of copyright. As a requirement for using open source software, the improved versions of software based on this source code must also be openly licensed.[52] The open source movement is essentially a collective creation activity. It is maintained by individuals and supported by firms which support open standards such as SUN, IBM and Oracle. Open source began in developed countries and is now gaining more influence and support in developing countries.

(e) General Remarks on 'Solutions' in Developed Countries: Merits, Limitations and Potentials

Developed countries have made some progress in the exploration of solutions for IPR in standards. Unfortunately governments in developed countries have been inconsistent and disparate in policy positions with regard to IPR in standardization. It should be noted that the limited achievements in developed countries are by no means well established. It might not be a surprise if IPR owners demand reconsideration of current decisions on control of IPR misuse in standards. The U.S. Supreme Court has not disclosed its view on the controversially different positions among competition authorities and various courts on the issue of IPR in standards. At the same time, even though developed countries are active in regulating IPR misuse in standardization at the domestic market level, they demand more stringent IPR protection and attempt to block discussions in international fora and policy initiatives in

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[49] Konstantinos Karachalios, presentation at the European Commission workshop on IPR in ICT standardisation available at http://ec.europa.eu/enterprise/ict/policy/standards/ws08ipr_en.htm (accessed: Feb. 28, 2009).

[50] Ministry of Economic Affairs, the Netherlands, "The Netherlands in Open Connection, an action plan for the use of Open Standards and Open Source Software in the public and semi-public sector", available at http://www.scribd.com/doc/3345990/The-Netherlands-in-Open-Connection-an-Action-Plan-for-the-Use-of-Open-Standards-and-Open-Source-Software-in-the-Public-and-Semipublic-Sector; The National IT and Telecom Agency, Ministry of Science, Technology and Innovation, "Measures to Promote Interoperability via Common Open Standards, Report from the Committee on Better Interoperability, December 2006", available at http://en.itst.dk/the-governments-it-and-telecommunications-policy/file-archive/interoperabilitet_EN%20.pdf/view?searchterm=None (accessed: Feb. 28, 2009).

[51] For information about the definition of open standards, please refer to The Global Standards Collaboration (GSC): "RESOLUTION GSC-12/05: (Opening) Open Standards (Re-affirmed), GSC12_Closing_17, 12 July 2007", available at http://www.itu.int/oth/T2101000004/en (accessed: April 23, 2009); see also Ken Krechmer, "Open Standards Requirements", *The International Journal of IT Standards and Standardization Research*, Vol. 4 No. 1, January - June 2006, available at http://www.csrstds.com/openstds.html (accessed: Feb. 28, 2009).

[52] For detailed information about open source, especially its licensing model, please refer to one of the representative licensing models - the General Public License (GPL) at http://www.gnu.org/licenses/gpl-3.0.html (accessed: Feb. 28, 2009).

developing countries. Despite this, there are certain stakeholders who are pursuing proper solutions for IRP in standardization and a number of private firms in developed countries have been making great efforts in this regard. Sun Microsystems, IBM and other firms with large IPR portfolios have also suffered from IPR misuse in ICT standardization. Individually or in coalitions they promote policy awareness with regard to IPR in standards. Since the U.S. government agencies have been more or less captured by monopolists, SUN and IBM have begun to cooperate with governments in emerging markets for relevant policy initiatives while being active in policy lobbying in the U.S. and Europe.[53] Therefore, developing countries may find it necessary and helpful to accommodate potential cooperation with these stakeholders.

III.2.2 Initiatives in Developing Countries Remain at the Paper Work Stage

In recent years, developing countries have realized the importance of IPR in standardization. Relevant policy initiatives have been undertaken. For example, South Africa has included the issue of IPR in standardization in a government document on standards development procedures. This is the first endeavour developing countries have made to address this issue through government policy. However, this document only requires IPR information disclosure and RAND licensing commitment by the IPR owners in general terms.[54] These requirements must be substantially clarified so as to make them actionable. In 2004, China drafted the National Rule on IPR in National Standards. This draft rule was based on the Common Patent Policy for ITU-T/ITU-R/ISO/IEC. At the same time, it made important clarifications on the procedures of IPR information disclosure. More importantly, it stipulated clearly that IPR included in mandatory standards may be subject to compulsory licensing.[55] This draft rule is, until now, the most encouraging government ruling. Predictably, it was strongly opposed by U.S. Government and certain multinational ICT firms, though various parties in developed countries privately encouraged China to push this rule forward. Unfortunately it has remained at its draft stage since 2004.

Efforts taken by developing countries to address the issue of IPR in standardization mainly concern open standards and open source policy initiatives in public ICT systems to help promote the overall market acceptance of open standards and open source software. In July 2004, the Malaysian Public Sector Open Source Software Master Plan was launched in order to "encourage and guide the Public Sector to adopt, develop and pervasively use Open Source Software."[56] In 2007, the South

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[53] For example, SUN has been sponsoring a series of conferences and publications on this issue, including a high level official international seminar co-hosted by various Chinese government agencies. Relevant information is available at http://www.thebolingroup.com/standards_series.html. A list of detailed actionable suggestions on IPR policies in ICT standardization facilitated by IBM was recently released and is available at www.research.ibm.com/files/standardsforstandards.pdf. Companies lobbying for regulations against IPR misuse and open standards formed a coalition European Committee for Interoperable Systems (ECIS). Its web site is http://www.ecis.eu/ (accessed: Feb. 28, 2009).

[54] The terms of the requirements are as follows:

"13 Patents(normative)

Technical reasons may justify the preparation of a standard in terms which include the use of items covered by patent rights, provided the holder of such identified patent rights is willing to negotiate licences under his rights on reasonable and non-discriminatory terms and conditions. A statement to this effect shall be included in the foreword of the standard. Standards South Africa shall not be held responsible for identifying any or all such patent rights.

Should it be revealed after publication of a standard that licences under patent rights, which appear to cover items included in the standard, cannot be obtained under reasonable and non-discriminatory terms, the standard shall be referred back to the relevant committee for further consideration."

Standards South Africa, "Standards for Standards - Part 1: The development of national standards and other normative documents", available at https://www.sabs.co.za/business_units/Standards_SA/index.aspx (accessed: Feb. 28, 2009).

[55] No official English version of this draft regulation is available. For reference, please refer to the translated version contained in an article by Emma Barraclough, "Winning the IP Standard Game", *Management Intellectual Property*, July/August, 2005.

[56] For information about the Master Plan and its implementation, please refer to the web site of the Malaysian Public Sector Open Software Program at http://www.oscc.org.my/ (accessed: Feb. 28, 2009).

African government approved the Policy on Free and Open Source Software Use for the South African Government. This policy requires the use of open standards and open source software by the South African government. It also requires that "all new software developed for or by the South African Government will be based on open standards,"[57] In a document released in December 2007, the Brazilian government made it clear that "wherever possible, open standards in technical specifications will be adopted. Private standards are accepted temporarily, keeping up the prospects for replacement as soon as there are conditions for migration."[58]

To a large extent both national rules on IPR in standardization and policies on open standards and open source software are limited in their practical effect. Even if developing countries had well designed and actionable national rules on IPR in standardization, major monopolists would be out of their jurisdiction: if IPR owners are not members of their national standardization bodies, they have no disclosure duty, nor are they obliged to RAND commitment. While proprietary standards with IPRs continue to dominate basic software such as those for operating systems, and relevant technical information is not available on reasonable terms, open standards and open source software can enjoy only limited space. As the core issue of IPR in standardization is IPR misuse, solutions must be found through regulation of IPR misuse. Conversely, open standards and open source would be undermined since they also rely on balanced IPR policies to receive the necessary input to develop open standards and open source hardware and software. In order to resolve the issue of IPR in standardization and therefore to lay down a fundamental base for sustainable development of the digital economy and information society, developing countries should focus on the core issue of IPR misuse in their national and international policies.

[57] Department of Public Service & Administration, South African, "Policy on Free and Open Source Software Use for South African Government", available at http://www.oss.gov.za/ (accessed: Feb. 28, 2009).
[58] Brazilian Government, Executive Committee of Electronic Government, "e-PING Standards of Interoperability for Electronic Government", available at https://www.governoeletronico.gov.br/anexos/versao-3-0-e-ping-ingles (accessed: Feb. 28, 2009).

IV. THE PROBLEM WITH CURRENT 'SOLUTIONS': IPR MISUSE AND AGGRAVATED ADVERSE EFFECTS

It would be misleading to state that problems which arise from the combination of IPR and standardization are rare and that an adequate solution has been found. Monopolists in ICT sectors and the government agencies behind them try to convince developing countries of this notion. They also assure developing countries that the market mechanism itself is sufficient to solve any IPR misuse which may arise. As has been pointed out in the previous chapter, current 'solutions' are far from adequate to address problems in IPR and standardization. Realizing that current 'solutions' can be easily circumvented, IPR owners have become bolder in their misuse of IPRs in standardization resulting in aggravated adverse effects of IPR misuse in standardization.

IV.1 The Problem with the Current 'Solutions'

IV.1.1 Non-disclosure of IPR Information

SSOs generally require owners to disclose their IPRs. Failure to do so leads to the nullification of exclusive rights of those undisclosed IPRs in the implementation of standards. This has been well established in relevant cases such as the Dell case[59] and Qualcomm case.[60] However, legal issues associated with non-disclosure of IPR information are far more complex than these two rather straightforward cases and warrant further clarification of SSOs' patent policies. In this regard, the Rambus case is an illuminative example.

Rambus was a member of JEDEC, an SSO for information technologies such as storage devices. In order to cover the standard concerned, Rambus had been modifying its patent applications based on information gained from JEDEC meetings. The patent policy of JEDEC did not specify if patent applications should be included in required IPR information disclosure. Accordingly, Rambus did not disclose the patent applications which were later granted and included in the standard. Rambus consequently sued other companies which had infringed these patents by implementing the standard concerned, and the defendants countered with anti-trust claims of hiding IPR information from an SSO.

At first it was decided by the district court that failure to disclose patent applications breached the duty to disclose IPR information and constituted fraud.[61] This decision was remanded by the United States Court of Appeals for the Federal Circuit whose opinion was that JEDEC's patent policy, which only required disclosure of the patent, without mentioning patent applications, did not constitute

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[59] In the Dell case, Dell had certified during the standard meetings that the VL-bus standard covered no IPR owned by them. However, eight months after that standard was adopted, and following its widespread use in over 1.4 million computers, Dell claimed that implementing the VL-bus standard violated Dell's patent rights and requested the users to consult with Dell to determine their infringement of Dell's exclusive right. U.S. competition authority FTC decided that Dell's fraudulent conduct of non-disclosure had tremendous negative effects on standardization and fair competition. Dell at last agreed to drop any patent claims that affected millions of personal computers using the industry standard 'VL-bus. See, for example, FTC Press Release: November 2, 1995 "Dell computer settles FTC charges; won't enforce patent rights for widely used computer feature" available at http://www.ftc.gov/opa/1995/11/dell.shtm (accessed: Feb. 28, 2009).

[60] In the recently decided Qualcomm case, the court decided that "[t]he consequence of silence in the face of a duty to disclose patent in a standard-setting organization...breached its duty to disclose." As a remedy, the court ordered the unenforceability of those patents in the standard-compliant products. See Qualcomm Incorporated v. Broadcom Corporation, No. 2007-1545 (Fed. Cir. 12/1/2008) (Fed. Cir., 2008).

[61] Rambus, Inc. v. Infineon Techs. AG, 164 F. Supp. 2d 743, 767 (E.D. Va. 2001).

a legal basis for fraud. At the same time, a dissenting opinion filed by another judge of the same Appeals Court found that Rambus was obliged to disclose the patent applications.[62] Almost parallel to the litigations in the courts, the U.S. FTC also took administrative measures against Rambus, where disagreements appeared both within administrative judges in FTC and between FTC and the court. Recently, the U.S. Supreme Court turned down the bid by FTC to review the decision of the Court of Appeals for the District of Columbia Circuit which set aside the decision of the FTC. After eight years of intensive litigations, the Rambus case is stalled with no final decision.[63]

The Rambus case reveals several rhetorical questions: What exactly does IPR information disclosure cover? Does it include the patent only or the patent as well as the patent application? When should IPR information be disclosed? Furthermore, what is the remedy for failure to disclose? Does failure to disclose IPR information to SSOs lead to monopolization or an intention to monopolize? These questions are substantial and controversial. The answers depend on the underlying issue, i.e. the contractual arrangements or the patent policies of the SSOs. Accordingly, the FTC and almost all of the above mentioned courts reiterated that patent policies of SSOs must be further clarified. For example, the U.S. Court of Appeals for the Federal Circuit stated explicitly in its decision on the Rambus case that there was in JEDEC patent policy "a staggering lack of defining details".[64] It went on to warn that "[a] policy that does not define clearly what, when, how, and to whom the members must disclose does not provide a firm basis for the disclosure duty necessary for a fraud verdict."[65]

IV.1.2 Arbitrary Interpretation of RAND

With regard to licensing for IPR in standards, most SSOs only require IPR owners to commit to licensing their IPRs in line with a reasonable and non-discriminatory (RAND) manner. Detailed commercial licensing terms must be negotiated by parties outside of SSOs. Regarded as a good principle, RAND serves no meaningful purpose as there is no corresponding mechanism to interpret what it really means except through a court of law.[66] In this situation, IPR owners can in effect demand whatever terms they want while at the same time claiming these terms to be reasonable. Aside from that, since licensing terms are negotiated outside of SSOs and remain as confidential information, there is no way to know whether they are non-discriminatory or not. Therefore, in practice, RAND has been too vague to serve any practical purposes. To make it worse, RAND could even be dangerously misleading since the concerns of SSOs and potential standards implementers on licensing terms have seemingly been addressed by RAND, resulting in the adoption of the standards and a large amount of investment in standards implementation. This situation provides IPR owners with a good position from which to ambush standards implementers into their IPR and to surface with exorbitant royalties and other strict licensing terms. Since at this stage standard implementers have made substantial investment and wish to avoid the halt of manufacturing required by an injunction, standards implementers normally accept whatever demands are made by the IPR owners. This chaotic situation caused by the misleading RAND continues to occur in almost all IPR infringement cases in the context of standardization such as the aforementioned Dell case and Qualcomm case.

For years, the ambiguity of RAND has led to disputes causing enormous difficulty regarding standards implementation.[67] In such disputes, the licensor would claim that the licensing terms it

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[62] Rambus Inc. v. Infineon Technologies AG, 318 F.3d 1081, 1102(Fed. Cir. 2003).
[63] For relevant information on administrative proceedings with regard to Rambus case in FTC, please refer to http://www.ftc.gov/os/adjpro/d9302/index.shtm (accessed: April 25, 2009).
[64] Supra note 62.
[65] Ibid.
[66] For example, parties can ask a court of law for the interpretation of RAND in light of common practices, for example, previous licensing agreements for the relevant field, etc.
[67] For example, it has been reported that patents disputes with regard to 3G standards have delayed the commercialization of 3G mobile phones. See WTO, supra note 33. It should also be noted that some parties in developing countries, for example Chinese DVD manufacturers, may not want to enter into any litigation due to financial or expertise constraints.

demands are reasonable and non-discriminatory and the licensee would argue that the licensor had violated RAND principles by charging exorbitant royalties and therefore had violated anti-monopoly laws. In mobile phone markets, Nokia and other mobile manufacturers have long disputed with Qualcomm, the major licensor of mobile technologies. In 2005, these disputes were intensified by a big anti-trust case where Ericsson, Nokia, Texas Instruments, Broadcom, NEC and Panasonic "allege that Qualcomm's licensing terms and conditions are not Fair, Reasonable and Non-Discriminatory (FRAND) and, therefore, may breach EC competition rules."[68] On the other hand, Qualcomm defended that the amount it demanded in royalties was just what it had committed in SSOs in accordance with RAND.[69]As yet, there has been no relevant decision and all parties continue to be swamped by the arbitrary interpretations of RAND.

IV.1.3 Biased Policy and Unbalanced Negotiation Power in Favour of IPR Owners

Since the 1980s, developed countries have been strengthening IPR protection in domestic and international policies. Other related policy practices such as coordination between competition policies and IPR have also been changed accordingly. Not surprisingly, concerned policies for IPR in standards in developed countries have been dominantly influenced by this policy shift and are biased in favour of IPR owners. This has given IPR owners a great bargaining chip in licensing negotiations on IPR in standards.

(a) Injunction Relief in Favour of IPR Owners

Injunction relief could be justifiable when it is used to protect the legitimate interests of IPR owners. Once there is a patent infringement dispute, the IPR owner can apply for an injunction to stop the alleged infringement. If justification for an injunction does exist, the threshold for granting an injunction should not be too low. However, in current U.S. judicial practices, it was the "general rule" that "courts will issue permanent injunctions against patent infringement absent exceptional circumstances".[70] This judicial practice with regard to injunctions, especially preliminary injunctions has caused great difficulty to the alleged infringers who are implementing standards. Standards implementation always involves large amounts of investment. Standards implementers are cornered into an extremely difficult position if all manufacturing must be stopped by an injunction incurred from only one patent involved in the infringement suit. IPR owners wishing to make an exclusive rights claim should do so immediately after their patent(s) are infringed. However, IPR owners normally "tolerate" the infringement and then issue patent rights claims when sunk investment has been made by the standards implementers. In this sense, IPR owners may violate the principle estoppel and courts have generally failed take the bad faith manner of IPR enforcement into due consideration.

Though the U.S. Supreme Court has begun to correct the biased "general rule" by empowering district courts to deny injunctions where appropriate,[71] some scholars in the U.S. have also suggested that the specific situation of standards implementation should be given due consideration when deciding to issue an injunction.[72] However, under the current highly profiled IPR protection regime, it is not known how long it will take and to what extent this suggestion will be accommodated by the courts.[73]

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[68] EC, European Commission Press release, Antitrust: Commission initiates formal proceedings against Qualcomm Reference: MEMO/07/389, Date: 01/10/2007, available at http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/07/389&format=HTML&aged=0&language=EN&guiLanguage=en (accessed: Feb. 28, 2009).

[69] Ibid.

[70] MercExchange, L. L. C. V. eBay, Inc., 401 F.3d 1323, 1339 (Fed.Cir.2005).

[71] eBay, Inc. v. MercExchange, L.L.C., 126 S. Ct. 1837, 1841 (2006).

[72] Mark Lemley and Carl Shapiro, supra note 15.

[73] It should be noted that that there is disagreement on this issue among scholars. See, for example, Golden, John M., "Commentary, 'Patent Trolls' and Patent Remedies", 85 *TEXAS L.REV*., 2111 (2007); Lemley, Mark A. and Carl Shapiro "Reply: Patent Holdup and Royalty Stacking", *Texas Law Review*, Vol. 85, 2007; Stanford Law and

(b) Anti-competitiveness of Patent Pools

Many patent pools have been designed to facilitate standards implementation. Patent pools themselves may not necessarily be anti-competitive. If a number of patents owned by multiple owners are needed in manufacturing, a patent pool, if well designed, could facilitate licensing negotiations and therefore help with technical transfer. However, patent pools can also be anti-competitive when used to shelter price collusions and to tie trivial or even invalid patents together with patents necessarily[74] needed for manufacturing.[75] Therefore, in western jurisprudence, whether a patent pool is legal or not is determined in accordance with the overall competition effect by making an evaluation using a rule of reason approach.[76]

However, in practice, the overall competition effect of patent pools has been evaluated in light of the overall policies with regard to IPR which is biased in favour of IPR protection. Theoretical research has concluded that pricing of these pools is problematic and would lead to exorbitant royalties.[77] Tying problems are also identified in patent pools. An example exists in the patent pool offered by Philips where the validity of one patent was challenged and even though Philips then agreed to remove that patent from the pool and also agreed not to include any claims pertaining to that patent, the royalty of that pool remained unchanged.[78] Though there are obvious anti-trust risks in patent pools, competition authorities have indicated rather clearly their general inclination not to initiate anti-trust enforcement actions against patent pools.[79]

Economics Olin Working Paper No. 345. Available at SSRN: http://ssrn.com/abstract=1005727 (accessed: April 14, 2009); Elhauge, Einer, "Do Patent Hold-up and Royalty Stacking Lead to Systematically Excessive Royalties?", *Journal of Competition Law and Economics.* 2008; 4: 535-570; Geradin, Damien and Miguel Rato, "Can Standard-Setting Lead to Exploitative Abuse? A Dissonant View on Patent Hold-Up, Royalty Stacking and the Meaning of FRAND", (April 2006). Available at SSRN: http://ssrn.com/abstract=946792 (accessed: April 14, 2009); Denicolò, Vincenzo, Geradin, Damien, Layne-Farrar, Anne and Padilla, A. Jorge, "Revisiting Injunctive Relief: Interpreting eBay in High-Tech Industries with Non-Practicing Patent Holders", (December 3, 2007). Available at SSRN: http://ssrn.com/abstract=1019611 (accessed: April 14, 2009); Gregory, Sidak, J., "Holdup, Royalty Stacking, and the Presumption of Injunctive Relief for Patent Infringement: A Reply to Lemley and Shapiro", *Minnesota Law Review*, Vol. 92, No. 3, pp. 714-748, 2008. Available at SSRN: http://ssrn.com/abstract=988694 (accessed: April 14, 2009); Gregory, Sidak, J., "Patent Holdup and Oligopsonistic Collusion in Standard-Setting Organizations", (February 7, 2009). *Journal of Competition Law and Economic*s, Vol. 5, No. 1, 2009. Available at SSRN: http://ssrn.com/abstract=1081997 (accessed: April 14, 2009).

[74] In most of the relevant literature, the word "essential" is used in this context. While the main purpose of the efforts with regard to IPR in standards is to facilitate standard implementation by avoiding IPR infringement, it could be understood that "essential" may mean unavoidable "infringement". In this vein, the word "necessary" could be better since "essential" may imply the order of significance while "necessary" would indicate only infringement concerns. The word "necessary" would better accommodate the situation where some small patents (not patent troll nor complementary patents) may also be necessary, though not necessarily "essential" in its normal meaning.

[75] This position is commonly shared by competition authorities in U.S., EU and Japan. See U.S. DOJ and FTC, "Antitrust Guidelines for the Licensing of Intellectual Property, Issued by the US Department of Justice and the Federal Trade Commission, April 6, 1995", available at http://www.usdoj.gov/atr/public/guidelines/0558.htm; European Commission, Commission Regulation (EC) No 772/2004 of 27 April 2004 on the application of Article 81(3) of the Treaty to categories of technology transfer agreements (Text with EEA relevance), *Official Journal L 123*, 27/04/2004 P. 011 - 0017, available at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32004R0772:EN:HTML; JFTC, Guidelines on Standardization and Patent Pool Arrangements at www.jftc.go.jp/e-page/legislation/ama/Patent_Pool.pdf (accessed: Feb. 28, 2009). For an overview of anti-trust analysis on patent pools from the perspective of academic analysis, please refer to George Priest, "Cartels and Patent License Arrangements," *Journal of Law and Economics*, Vol. 20, No. 2. Oct., 1977. Joshua Newberg, "Antitrust, Patent Pools, and the Management of Uncertainty", 3 *Atlantic Law Journal,* 1, 2000.

[76] U.S. DOJ and FTC, supra note 75. See also European Commission, Commission Notice — Guidelines on the application of Article 81 of the EC Treaty to technology transfer agreements, *Official Journal of the European Union,* C 101, Volume 47, 27 April 2004, available at http://eur-lex.europa.eu/JOHtml.do?uri=OJ:C:2004:101:SOM:EN:HTML (accessed: March 8, 2009).

[77] Mark Lemley and Carl Shapiro, supra note 15.

[78] For relevant information, please refer to http://it.chinanews.cn/it/news/2006/12-12/836127.shtml (accessed: Feb. 28, 2009).

[79] See U. S. DOJ Business Review Letter for MEPG LA at http://www.usdoj.gov/atr/public/busreview/letters.htm (accessed: April 25, 2009).

Released from potential anti-trust enforcements, IPR owners have indulged themselves by forcing anti-competitive licensing terms upon licensees. During many commercial "negotiations", the position of the IPR owners or their delegates would simply be: These are our licensing terms which have been reviewed by the competition authority. You may choose to accept them or not but we do not intend to change even though you may find some of them problematic. Under this situation, manufacturers/licensees would either have to accept the licensing terms and end up running their business at lower profits eventually leading to bankruptcy, or risk infringing IPRs and end up being seized at the border when exporting or being sued in courts. This has been the case for DVD manufacturers in China, and small and medium enterprises (SMEs) in developed countries as well.[80]

(c) Unilateral Refusal to License

In ICT markets, fundamental interoperability needs entail the disclosure of technical information in key interfaces. Therefore, it has been commonplace to disclose that information in ICT industries.[81] The owner of the interface information may be inclined to do so since it could be necessary for other firms to develop complementary products which are interoperable with the network controlled by the IPR owner. With more and better complementary products available, the IPR owner's network will enjoy better market acceptance. However, once the market has been locked into its network, the IPR owner could monopolize the market and change its policy. It could demand exorbitant royalties and other restrictive licensing terms. To make matters worse, the IPR owner could be tempted to leverage its monopoly on other markets. For example, after securing its dominance in operating systems with its WINDOWS, Microsoft, allured by further profits, decided to move into the server market. It then stopped providing WINDOWS interface information to its server competitors. Accordingly, users had to switch to Microsoft servers in order to ensure the interoperability of servers with WINDOWS. Microsoft expanded its server market share dramatically. It should be noted that the interface information provided by WINDOWS was important simply because it is indispensable when connecting the dominant systems, not necessarily because it was technically superior or innovative. In effect, the interface technology could simply be some arbitrary communication protocol. Therefore, compulsory licensing on interface information is not necessarily a disincentive to innovation. For this reason the European competition authority imposed compulsory licensing on WINDOWS interface information.[82]/[83]

The adverse effect of refusal to license as shown above can be severe in the context of standards/networks, and the justification for compulsory licensing is rather straightforward, as demonstrated in the outcome of the case of EC - Microsoft. However, this does not necessarily mean that refusal to license IPR in standards will be an easy matter for developing countries by, for example, duplicating what the EC competition authority has done in the Microsoft case.

Refusal to license by itself has long been controversial in western jurisprudence. On the one hand, the perception exists that IPR is so essential to competition that licensing must occur across the board,[84] while on the other hand, refusal to license is considered "the essence of the patent holder's

[80] For some companies, when facing infringement suits, they may choose to swallow the bitter pill by paying a high amount of demanded royalties in order to maintain their good reputation with IPR protection only to later on find themselves betrayed. See, for example, a case where Research in Motion paid 450 million dollars for five patents, one of which was found invalid by the patent authority and the other four problematic, in Lorraine Woellert, "Did RIM Pay Too Soon?", available at http://www.businessweek.com/bwdaily/dnflash/apr2005/nf2005048_4289_db016.htm (accessed: May 17, 2009).

[81] European Commission, supra note 17.

[82] Ibid.

[83] It might also be necessary to investigate whether Microsoft has applied similar strategies in other markets such as those for word processing and internet browsers.

[84] Herbert Hovenkamp, Mark Janis, and Mark Lemley, "Unilateral Refusals to License in the U.S.", in Herbert Hovenkamp, Mark Janis, and Mark Lemley, *IP and Antitrust: An Analysis of Antitrust Principles Applied to Intellectual Property Law*, New York: Aspen Law & Business, 2004.

right under the patent law".[85] Though the EC made a huge step towards invoking compulsory licensing in the Microsoft case, under the highly profiled IPR protection legal framework in developed countries, the Microsoft complaint that "the Commission is seeking to make [sic] new law that will have an adverse impact on intellectual property rights..."[86] could be quite appealing to officials both in U.S. and EC pressing for higher IPR protection. The EC is therefore trying to view the Microsoft case as one in "exceptional circumstances" so that future copying of EC practice is limited. Theoretically, developing countries could copy the EC practice but, in reality, this would be highly doubtful as developing countries need time, expertise and political determination to make anti-trust regulations against IPR related conduct.[87] U.S. officials intervened heavily in the EC's Microsoft case.[88] While the EC was strong enough to rebuff the U.S. by stating, "[t]his is of course an intervention which is not possible";[89] developing countries may not be able to do so. It should be noted that all ICT markets are interconnected. Refusal to license could help the monopolist leverage its monopolization in one market to many other markets. If compulsory licensing is to be invoked only in "exceptional circumstances", ICT industries will continue to suffer.

IV.2 Aggravated Adverse Effects of IPR Misuse in Standardization

Though developed countries have made some progress in regulating IPR misuse in standards, IPR misuse is far from being properly controlled. The Rambus case, lack of anti-trust scrutiny on patent pools and the intervention in EC Microsoft case by U.S. officials indicates that developed countries, especially the U.S., are not in a position to exercise due regulation on IPR misuse in standards. When developing countries began to participate in standardization, developed countries were more ready to help secure the market advantage of their IPR owners than to regulate IPR misuse conduct. Realizing this situation, IPR owners are becoming even bolder in manipulating standardization and exploiting relevant markets with their IPRs. The adverse effect of IPR misuse has therefore been, in the face of so called 'solutions' for IPR in standards, aggravated, rather than mitigated.

IV.2.1 IPR Misuse and Manipulation of Standardization to Exclude Competitors

The strategic importance of standards due to its network effect arouses "violent passions" in competition on standards.[90] When combined with the tremendous advantage gained through IPR abuse in standards, standards competition pushes IPR owners to such an extent that they exert every available means to secure control of standards and to exclude competitors.

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[85] W. L. Gore & Associates v. Carlisle Corp., 529 F.2d 614 (3d Cir. 1976).

[86] Microsoft, "The European Commission's Decision in the Microsoft Case and its Implications for Other Companies and Industries", April 2004, available at www.microsoft.com/presspass/download/legal/EuropeanCommission/CommentonECMicrosoftDecision.pdf (accessed: March 9, 2009).

[87] Carlos Correa, *Intellectual Property Rights, the WTO and Developing Countries: The TRIPS Agreement and Policy Options,* New York, Zed Books, Third Work Network, 2000.

[88] For example, Assistant Attorney General for Antitrust, Thomas O. Barnett said in an official statement that "[t]he standard applied to unilateral conduct by the CFI (*Court of First Instance of the European Communities* [italics added]), rather than helping consumers, may have the unfortunate consequence of harming consumers by chilling innovation and discouraging competition." Assistant Attorney General for Antitrust, Thomas O. Barnett Issues Statement on European Microsoft Decision, available at http://www.usdoj.gov/opa/pr/2007/September/07_at_725.html (accessed: March 9, 2009).

[89] See the report by Richard Thurston, "US government 'lobbied EC' over Microsoft fine", Wednesday, 27 September 2006, available at news.zdnet.co.uk/itmanagement/0,1000000308,39283617,00.htm (accessed: March 9, 2009). See also the report "Kroes rebuffs U.S. on Microsoft ruling, available at http://www.ft.com/cms/s/0/8954aff4-66cf-11dc-a218-0000779fd2ac.html (accessed: March 9, 2009) (where Ms Kroes stated: "It is totally unacceptable that a representative of the U.S. administration criticised an independent court of law outside its jurisdiction. The European Commission does not pass judgment on rulings by US courts and we expect the same degree of respect.").

[90] 'Do it my way (technical standards in the computer industry)', *The Economist* (US), 27 February 1993.

The first example lies in the OOXML word processing standard proposed for international adoption at ISO. Many ISO Members were extremely worried about the IPR policies with regard to this standard. Members either had no clear idea how many IPRs were included in this standard, nor did they have any idea about the licensing terms. It was obvious to them that this standard was essentially controlled by Microsoft through proprietary technologies which caused greater concern within the U.S., including the U.S. Department of Defence.[91] OOXML was rejected during the first round of standard ballot. However, during the second round of ballot, while most of the Members who opposed OOXML conceived that no substantial improvement had been made to OOXML and continuously voted against its adoption, a number of small ISO Members who seldom participated in ISO ballots showed up and voted in favour of this standard so that OOXML successfully became an ISO international standard. Brazil, India, South Africa and Venezuela filed complaints against this result and were later turned down.[92] Currently, this problematic standard has become an international standard and WTO Members have a legal obligation to adopt it when they are developing relevant technical regulations. OOXML caused great controversy regarding the integrity of international standard setting and due assurance of IPR policy for standards.[93] Without due evidence, it may not be proper to allege that Microsoft had bought the votes from some ISO members. However, whether means such as "side agreements, inducements, package deals, reciprocal agreements, or commercial pressure" have been used or not warrants careful investigations.[94]

As mentioned earlier, when developing countries began participating in standards competition, developed countries tended to exert political means to help their IPR owners secure control of standards. A second example of competitor exclusion is WIFI, the international standard for wireless connection which has long received complaints for its cyber security shortcomings. WAPI is a new wireless Internet connection standard designed by a small Chinese firm of around 30 software engineers. Even though both American and Chinese technical experts agree that WAPI is more reliable than the current standard WIFI to address cyber-security, Intel and other firms dominating the WIFI standard resorted to political means to suppress the WAPI standard. Finally, the U.S. government brought up this issue at the WTO and the Joint Committee on Commerce and Trade (JCCT), a bilateral trade policy dialogue at Vice Premier level. In the end, without too much discussion on the consistency of WTO rules, China yielded and agreed to postpone the implementation of the WAPI standard.

The exclusive nature of IPR and currently uncontrolled IPR misuse in standards makes it feasible for IPR owners to control standards and exclude competitors. "Standards are the foundation of

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[91] Egan Orion, "OOXML loses US vote for fast-track ISO approval", available at http://www.theinquirer.net/inquirer/news/822/1009822/ooxml-loses-us-vote-for-fast-track-iso-approval (accessed: March 10, 2009).

[92] For more information related to OOXML, please refer to http://www.groklaw.net/staticpages/index.php?page=20080719233709726 (accessed: March 9, 2009).

[93] In this context, it may also be helpful to look beyond the OOXML case itself. The word processing standard Open Document Format (ODF) which was mainly sponsored by IBM and SUN has already been accepted by the ISO as an international standard. The word processing technology on which OOXML is based has been a dominant *de facto* standard for quite a long time and competed with ODF with great vigor for ISO recognition in recent years. These facts may warrant systematic consideration of the current standardization regime on at least the following points.

1. The success of some *de facto* standards and the standards developed by associations such as the World Wide Web Consortium (W3C) may have raised the question whether international standardization organizations should be more responsive to market needs so as to make their standards more relevant in the presence of faster technical changes.
2. How shall international standardization organizations deal with more than one international standard for the same technology? Should it be considered a failure for international standards coordination or a normal practice to accommodate competition technologies and interests? Then what is the essence and basic objective of standard coordination at international level? Note that there are also three international standards for the third generation (3G) mobiles recognized in the ITU.

[94] The European Commission is concerned if such means were used during the voting on OOXML, see "Kroes calls for open standards in eGovernment", available at http://www.euractiv.com/en/infosociety/kroes-calls-open-standards-egovernment/article-173209 (accessed: March 10, 2009).

interoperability".[95] If IPR misuse continues to be uncontrolled, not only fair competition but also the information society is in peril.

IV.2.2 Exorbitant Royalties and Over-Exploitation of Downstream Manufacturers

Though exclusion of competitors is indeed a serious concern of developed countries and IPR misuse leading to that situation can be controlled in "exceptional circumstances", exorbitant royalties seem to be of less concern and even tolerated by governments in developed countries. This is especially true when the targets of those exorbitant royalties are manufacturers in developing countries.

Where standards implementation involves a substantial amount of labour intensive manufacturing, excluding the manufacturers altogether is not the profit maximization strategy of IPR owners who would rather subject the manufacturers to royalty exploitation. Under this scenario, IPR misuse eventually leads to exorbitant royalties which exceed the anticipated price target of a product and force the manufacturers to shut down their production. While it is not the intention of IPR owners to kill the goose for the egg, they may often not be aware that the manufacturers must purchase licenses from more than one group of IPR owners in order to manufacture standard compliance products. Each group of IPR owners wants to maximize royalties but the aggregate royalties demanded by various groups of IPR owners will in many cases drive the profits of the manufacturers to zero, or even below.[96]

On the other hand, large IP holding companies can strike cross licensing deals that mitigate or eliminate exorbitant royalties. For example, companies such as Nokia, Ericsson, Philips and Alcatel cooperated on GSM mobile network construction. With regards to IPRs, they entered into an agreement where IPRs were pooled for common use and they would not sue each other for unauthorized uses.[97] Moreover, big companies in developed countries can afford the litigation costs and can balance exorbitant royalties with anti-trust counter claims, as Nokia and others have been doing against Qualcomm.[98]

Manufacturers in developing countries are equipped with neither a large IPR profile to enter cross-licensing, nor enough legal expertise or financial support to enter litigations. Many times, exorbitant royalties will drive them into bankruptcy. In the Chinese DVD case, "Chinese companies are constrained by hefty DVD royalties, which range from US$15 to $22 on players that today often retail for less than $60."[99] As a result, the whole DVD machine industry in China has undergone a heavy blow when facing patent claims from various (groups) of IPR owners. By mid 2004, the number of DVD manufacturers had dwindled from around 140 to 30.[100]

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[95] Neelie Kroes, Commissioner of European Commission for Competition, "Being open about standards", Open Forum Europe - Breakfast Seminar, Brussels, 10th June 2008, available at http://europa.eu/rapid/pressReleasesAction.do?reference=SPEECH/08/317&format=HTML&aged=0&language=EN&guiLanguage=en (accessed: Feb. 28, 2009).

[96] This is in line with the predictions of Mark Lemley and Carl Shapiro who concluded this in their research. "Even the 'low' royalty rates on components or in the electronics industries are sufficiently high that paying royalties for one patent can sometimes wipe out essentially all the expected profit from the product." Mark Lemley and Carl Shapiro, supra note 15, at p.2035.

[97] Rudi Bekkers, Geet Duysters and Bart Verspagen, supra note 19.

[98] For information on this highly profiled case, please refer to Qualcomm Incorporated v. Broadcom Corporation, No. 2007-1545 (Fed. Cir. 12/1/2008) (Fed. Cir., 2008)

[99] Deloitte, "Technology Firms Risk Losing Advantage as China's Influence on Global Standards Reaches Critical Levels ", available at http://www.deloitte.com/dtt/press_release/0,1014,sid%253D1018%2526cid%253D56070,00.html (accessed: Feb. 28, 2009).

[100] http://www.sipo.gov.cn/sipo2008/ztzl/zxhd/ggkf/bdpl/hg/200812/t20081218_430596.html (accessed: Feb. 28, 2009).

IV.2.3 Adverse Effects on Access to Knowledge and Sustainable Innovation

When standardization falls prey to anti-competitive activities, access to knowledge and innovations can be tremendously jeopardized. Due to the cumulative nature of innovation,[101] if prior technologies are not available to innovative firms at reasonable terms, the follow-up innovations will be seriously hampered.[102] Besides, ICT technologies are undergoing rapid technical changes and are characterized with ample opportunity of paradigm/model changes. Due to the path dependence and extra inertia of standards switching,[103] incumbent firms have the inclination to hold to the old model and lose incentives for further innovations, especially innovations for new paradigms. Small and medium firms are active in new paradigm innovations. However, these new paradigms are more often than not strangulated by incumbent monopolists. As mentioned earlier, WAPI is a good example in this regard. It should also be noted that ICT technologies, especially software, are not necessarily high-tech as such any longer. What could be more important is to maintain an open and fair playing field for creative common projects such as open source.[104]

IV.2.4 Adverse Effect on Developing Countries

IPR misuse in standards is harmful to all of the global digital community but its adverse effect is especially injurious to the developing world. Adverse effects caused by exorbitant royalties are especially targeted at manufacturers in developing countries. This is in effect a disruption of product life cycle, where developing countries could gain through manufacturing when products are at their mature and standardized stage. When product life cycle runs normally, both developed countries and developing countries are better off.[105] However, driven by a manufacturing trade with more technological intensity from Brazil, Russia, India and China (BRIC), developed countries feel the urgency to "move up the value chain", which is countered by their "difficulties in strengthening innovation performance."[106] Under this situation, developed countries press on the current value chain for profit through such means as demanding exorbitant royalties. This disturbs the usual product life cycle and undermines the learning by doing necessary for start-ups in developing countries. To make matters worse, since IPR owners often raise their IPR claims afterwards, manufacturers in developing countries are forced to shut down industry widely, forfeiting both their market opportunities and sunk investment.

In the end, all the adverse effects of IPR misuse in standardization are eventually passed on to consumers both in developed and developing countries. While consumers in developed countries may suffer from higher prices, obviously consumers in developing countries suffer much more than that.[107]

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[101] For the explanation of the cumulative nature of innovation and its implication for IPR policies, please refer to Suzanne Scotchmer, "Standing on the Shoulders of the Giants: Cumulative Research and the Patent Law", *Journal of Economic Perspectives,* Vol.5 (1), Winter, 1991.

[102] As has been observed, stronger IPR protection leads to patent thicket, which, in the context of "cumulative innovation and multiple blocking patents...can have the perverse effect of stifling, not encouraging innovation." Carl Shapiro, supra note 14, at p.120; see also Richard Raysman and Peter Brown, supra note 18 .

[103] For relevant literature in this regard, please refer to Brian Arthur, "Competing technologies: an Overview", in Giovanni Dosi et al. (eds.), *Technical Change and Economic Theory*, New York: Pinter Publishers, 1988; Paul David, "Clio and the Economics of QWERTY", *American Economic Review*, Vol. 75, 1985. Peter Lewin, "The Market Process and Economics of QWERTY: Two Views", *Review of Austrian Economics*, Vol. 14, 2001.

[104] With regard to the concept and practices of access to knowledge and creative commons in ICT fields, please refer to relevant academic research and advocacy work at Stanford Law School, available at http://cyberlaw.stanford.edu/freetags/creative-commons and Yale Law School at http://www.law.yale.edu/intellectuallife/informationsocietyproject.htm (accessed: March 12, 2009).

[105] For the explanation of product life cycle, please refer to Raymond Vernon, "International Investment and International Trade in the Product Cycle", *Quarterly Journal of Economics,* Vol. 80, 1966.

[106] Organization for Economic Cooperation and Development (OECD): "Innovation and Growth: Rationale for an Innovation Strategy", available at http://www.oecd.org/dataoecd/44/50/40908171.pdf (accessed: April 25, 2009).

[107] Despite various endeavours, "[t]he disparities and inequalities in access are evolving: the digital divide is taking new forms in terms of the difference in the speed and quality of access to ICTs." ITU/UNCTAD, "World Information

If IPR misuse in standardization is not well controlled, development objectives relying on information technologies cannot be fulfilled.[108] Governments in developing countries that have based their ICT infrastructure and social services on relevant standards or networks may not be able to afford the royalties needed to produce necessary equipment and end user facilities. Subsequently, their infrastructure construction becomes stranded and social services such as on-line health and on-line education remain a modality. National information security cannot be assured when information systems rely on proprietary technologies. This is especially dangerous for the technically less sophisticated developing countries. Eventually, countries will become isolated and increasingly unable to interconnect with the rest of the world for trade, services, and information exchange.

If efforts by national authorities and international organizations with regard to information for development projects are to be fulfilled, the issue of IPR misuse in standardization cannot be continuously neglected.[109]

Society Report 2007: Beyond WSIS", June 2007, available at http://www.itu.int/osg/spu/publications/worldinformationsociety/2007/report.html (accessed: March 9, 2009).

[108] For information on developments projects based on information technologies, please refer to the web site of World Summit of Information Society of the united Nations (UN/WSIS) at www.itu.int/wsis/ (accessed: March 12, 2009).

[109] For example, even though a report by the World Bank clearly indicates "Public-Private Partnerships, Effective Competition, Vital to Extend Reach and Use of ICT", the report does not include IPR in standards in its elaborations on policy issues such as public-private partnership and competition policy. World Bank, "Global Trends and Policies - 2006 Information and Communications for Development ", available at www.worldbank.org/ic4d (accessed: April 25, 2009).

V. EXPLORATION OF MEANINGFUL SOLUTIONS FOR IPR IN STANDARDS

Dealing with IPR misuse in standards is by no means an easy task. However, following years of in-depth discussion, there has been substantial progress in policy recommendations for which competition authorities in developed countries and many stakeholders, including most IPR owners have shown their support. The main reason why these recommendations have not been put into policies is the distorting lobbying of monopolists. Developing countries should be encouraged to carry forward relevant policy recommendations.

Currently, the main challenge is to carry out positive and coherent initiatives at both international and the national levels. For this purpose, existing 'solutions' such as IPR information disclosure could be substantially clarified. Anti-trust solutions for IPR misuse in standards could be extended from "exceptional circumstances" to generic jurisprudence while scrutiny of patent pools should be intensified. Misconceptions on joint price discussions in SSOs could be corrected. Aside from this, new legal and regulatory initiatives such as compulsory licensing in IP law, regulations on interoperability, coordination between IP offices and SSOs, due open standards and open source policies are warranted.

V.1 Strengthening the Mandatory *Ex Ante* Disclosure Mechanism

Because of the insufficiency of RAND commitments (due to the vagueness and lack of transparency around the commitments as described in earlier chapters) *ex ante* disclosures of maximum royalty rates and the most stringent licensing terms are necessary to ensure integrity and competitiveness in ICT standardization. Standardization, by nature, is decision making based on the overall consideration of technologies and economic factors such as standard implementation costs. Therefore, complete information about technologies and their associated costs must be secured before standard development and adoption is completed, so as to ensure the quality and the efficient implementation of standards. *Ex ante* disclosure is also needed in order to ensure fair competition. Once standards have been set, it is very hard, and often impossible, for alternative technologies to compete. Therefore, it is crucial to ensure all technical alternatives are disclosed with associated costs in order to compete in SSOs before standards are set.[110] Besides, inclusion of their IPR in standards gives the IPR owners various advantages. Therefore, IPR owners should be subject to *ex ante* disclosure obligations.

V.1.1 Further Clarifications of IPR Information Disclosure

Patents comprise both technical information and legal information such as the applicable territory, the term of protection, the scope of protection and the ownership of rights, which form the basis for future allegations. However, current patent information disclosure requirements by most SSOs lack clarity and transparency, making disclosure easy to circumvent by IPR owners. In this respect, some clarifications regarding information disclosure are warranted.

(a) What to disclose?

IPR policies of SSOs should specify the disclosure of both granted patents and patent applications. This would avoid patent applicants using technical information gained at standard meetings to modify their applications to cover the standard.

[110] Deborah Platt Majoras, Chair of U.S. FTC, "Recognizing the Procompetitive Potential of Royalty Discussions in Standard Setting", Stanford University Law School, San Francisco, September 23, 2005, available at http://www.ftc.gov/bc/tech/property/intellect.htm (accessed: June 8, 2009).

(b) Who should disclose?

The primary responsibility for disclosure should be borne by the IPR owners. Failure to disclose should form the basis of nullification of exclusive IPR rights in the context of standard implementation and/or accepting a default royalty rate, including royalty free, if the SSOs have such requirements. Disclosure by a third party should be encouraged. SSO members would have the incentive to disclose IPRs owned by others due to their competitive relationship. It is also desirable to make the standards setting process more easily accessible to the public, so that non-members could contribute their knowledge of relevant IPR information to SSOs, including even information on the IPRs owned by non-members of SSOs.

(c) Patent search

Most standardization bodies state that they are not responsible for patent search. However, when taking into consideration the fact that some of their standards development has been sponsored by governments, it could be justified to request SSOs to provide patent searches as public goods. It may be fair to request SSO members who are proposing standards to do patent search since they usually have specific interests; either they need the standards as users or they are technically competitive and want to include their IPR in the proposed standards. It is therefore reasonable to request those SSO members who are proposing standards to make initial patent searches. With regard to patent search, it might be helpful to request that IP offices, based on appropriate contractual or administrative arrangements, give SSOs due facilitation and assistance.

(d) When to disclose?

IPR information disclosure should be made as soon as possible and in any event before the adoption of a standard. However, either to facilitate the standards setting process or to avoid hold-up, it would be preferable to lay down a detailed timetable. There is always the dilemma between disclosure and standard setting. If there is not enough IPR disclosure, it is difficult to know about the technical direction of the standard and if the technical standards direction is not clear, IPR owners may not know what IPRs to disclose. Therefore, it is necessary to set the disclosure timing in accordance with a detailed and specific scenario. [111]

V.1.2 Mandatory Unilateral Ex Ante Disclosure of Licensing Terms

SSOs need pricing information about the IPR, without which the implementation of the standards would be highly unpredictable. However, price discussions *per se* have been strictly forbidden under competition policy. As an alternative, unilateral *ex ante* disclosure of maximum royalty rates and the most stringent licensing terms can be employed to gain information about pricing without violating competition policy.

VMEbus International Trade Association (VITA), an SSO for information technologies, is the only SSO which has requested mandatory unilateral disclosure of the most stringent licensing terms, including the maximum royalty for the patents included in standards. Some IPR owners have expressed their resistance to *ex ante* disclosure of licensing terms claiming that this requirement would force them to leave the SSOs. Motorola, for example, appealed to the American National Standards Institute (ANSI) requesting the suspension of ANSI accreditation of VITA as an SSO. VITA successfully defended its IPR policy and Motorola's appeal was dismissed. VITA was also assured with regard to the legitimacy of mandatory unilateral *ex ante* disclosure of licensing terms by obtaining a business review letter, where DOJ indicated "no present intention to take antitrust

[111] IPR policy of VITA provides a good example for time requirements for disclosure. IPR policy of VITA is available at www.vita.com/disclosure/VITA%20Patent%20Policy%20section%2010%20draft.pdf (accessed: Feb. 28, 2009).

enforcement action against" VITA patent policy.[112] Other SSOs encourage voluntary unilateral *ex ante* disclosure of licensing terms, such as the Institute of Electrical and Electronics Engineers (IEEE) and the European Telecommunications Standards Institute (ETSI).

V.1.3 Rationalizing Joint Price Discussions in SSOs

Joint Price discussions by SSO members on licensing terms for standards implementation has long been regarded as illegal *per se* under anti-trust law because joint pricing *per se* is illegal. Currently, almost all SSOs avoid joint price discussions altogether. However, such discussions in SSOs could be pro-competitive and warranted. For instance, while *ex ante* unilateral disclosure of licensing terms may provide some information, it is not sufficient. It could be warranted that offers of licensing terms are open for calibration after being disclosed unilaterally.

Currently competition authorities have noted the above points and have shown flexibility. While the competition authorities still warn that joint *ex ante* royalty discussions can offer an opportunity for price-fixing agreements that are *per se* illegal, they have made it clear that joint *ex ante* royalty discussions do not warrant *per se* condemnation.[113] In effect, there have been some forms of joint pricing such as joint royalty cap and default royalty[114] that have been practised without serious anti-trust challenges. However, there are indeed anti-trust risks in these forms of joint pricing. It should also be noted that joint royalty cap would not in itself lead to a reasonably low royalty. For example, it is hard to foresee whether "a single-digital percentage of sales price" royalty cap is truly in line with RAND or not.[115] For example, a single digit percentage may mean 9.9%, which could be formidable for manufacturers, and especially for new entrants. Besides, it is also necessary to know how much the incumbent has been paying for royalties in order to ensure the non-discriminatory requirement of RAND. On the other hand, royalty cap could lead to a reasonably low royalty or even royalty free, in the case of W3C patent policy. Under this complex situation where joint pricing could lead to dramatically different results, joint pricing warrants a rule of reason approach with regard to its competition effect evaluation. As a whole, joint pricing should be tolerated by competition policy and should not be considered *per se* illegal.

To address the complexity associated with joint pricing, a rule of reason approach, rather than a simple *per se* illegal approach to joint price discussions is therefore highly desired. Under this approach, joint price discussions should be generally allowed. At the same time, it is necessary for competition authorities to provide due safe harbour and anti-trust limits so that SSOs may have a clearer idea as to what can be done and what not.

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[112] This business review letter is available at http://www.usdoj.gov/atr/public/busreview/219380.htm (accessed: Feb. 28, 2009).

[113] As stated by Chair of FTC: "Thus, by pointing out the potential for joint *ex ante* royalty discussions to mitigate or eliminate the hold-up problem, I do not mean to suggest that such discussions in SSOs are required. I simply offer my view that conducting legitimate joint *ex ante* royalty discussions does not warrant *per se* condemnation." Deborah Platt Majoras, supra note 110. This perception is also shared by academia. For example, "Antitrust law should permit SSOs at a minimum to determine what participants own patents covering a standard and what licensing terms they are offering for those patents. And in some circumstances, antitrust law should go further, permitting groups to collectively negotiate royalty rates." Mark Lemley and Carl Shapiro, supra note 15, at p.2043.

[114] For examples of default royalty, please refer to default royalty free policy in W3C available at http://www.w3.org/Consortium/Patent-Policy-20040205/ (accessed: April 25, 2009) and the default royalty policy of Audio and Video Coding Standard Workgroup of China (AVS) available at http://www.avs.org.cn/en/ (accessed: April 25, 2009).

[115] A group of companies have decided with regard to royalty for IPRs in the LTE standard that "Specifically, the companies support that a reasonable maximum aggregate royalty level for LTE essential IPR in handsets is a single-digit percentage of the sales price. For notebooks, with embedded LTE capabilities, the companies support a single-digit dollar amount as the maximum aggregate royalty level. The parties believe the market will drive the LTE licensing regime to be in accordance with these principles and aggregate royalty levels." Press release, "Wireless Industry Leaders commit to framework for LTE technology IPR licensing, April 14, 2008, available at http://www.ericsson.com/ericsson/press/releases/20080414-1209031.shtml (accessed: April 25, 2009).

V.2 Using TRIPS Flexibility: Compulsory Licensing

Problems arising from the combination of IPR and standards are embedded in the current IPR regime. Solutions to the issue of IPR in standards could be explored within IP law or other related legislation such as anti-competitive control on IPR misuse. For the practical consideration that national IP law needs to be consistent with WTO rules, it is necessary to begin with an analysis of TRIPS.

V.2.1 Public Interest as the Overarching Ruling

Art. 7 of TRIPS establishes the objective of protection and enforcement of IP, where welfare and a balance of rights and obligations should prevail. Further development of the information society means that integrity of standardization will become valued as an indispensable embodiment of public interest. Interoperability would then be recognized as an important policy objective, so much so that IPR misuse should be adequately and efficiently controlled for the sake of public interest.

Standards are considered as a kind of quasi public goods.[116] According to Art. 27 of TRIPS, to protect *ordre public*, certain exclusion may be made to patentable subject matter, provided that such exclusion is not made merely because the exploration is prohibited by law. For instance, the UNOCAL case has invoked discussion on the public interest implications of IPR in standards and the patentability of subject matter. When the patent application filed by UNOCAL had been included in a mandatory gasoline standard in the State of California, many people, including the Attorney General of that state opposed the grant for that patent since it would raise the price for gasoline approximately 5.75 cents per gallon of gasoline sold, and 90% of these cost was likely to be passed on to consumers through increased gas prices. While it was not surprising that the U.S. Supreme Court supported UNOCAL in the end, the issue raised concerns about patentability for subject matters essential for standards.[117] Gasoline has an impact on the public in terms of price but ICT standards have a wider and more profound impact on the society as a whole. Therefore an exemption on patentability in certain circumstances should be made. With regard to the question of negative impact on innovation, in this case, provision of public subsidy on R&D could be considered as compensation.

V.2.2 Use without Authorization of Patents for the Purposes of Standardization

Compulsory license, similar to 'Other Use without Authorization' under Art 31 of TRIPS, could also be invoked for IPR in standardization. The application of compulsory licensing to IPR in standardization may raise legitimate concerns as to whether they "do not unreasonably conflict with a normal exploitation of the patent."[118] Clear conflict with current WTO rules is evident if this application is undertaken by invoking Art. 31 since, except for the case of anti-competitive remedy, the scope of use without authorization under this article is limited to "public non-commercial use" and "supply of the domestic market".[119] As for Art 31, the public and commercial cooperation and globalization in the ICT sector, including semi-conductors, have prevailed so that it could be justifiable to lift the limits of "public non-commercial use" and "supply of the domestic market". For this purpose, substantial effort similar to the Declaration on the TRIPS Agreement and Public Health

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[116] Charles Kindleberger, "Standards as Public, Collective and Private Goods", *Kyklos*, Vol.36, 1983.
[117] Janice Mueller, "Patent Misuse through the Capture of Industry Standards", 17:2, *Berkley Technical Law Journal*, 623, 2002.
[118] Art. 30 of WTO/TRIPS: "*Exceptions to Rights Conferred Members* may provide limited exceptions to the exclusive rights conferred by a patent, provided that such exceptions do not unreasonably conflict with a normal exploitation of the patent and do not unreasonably prejudice the legitimate interests of the patent owner, taking account of the legitimate interests of third parties."
[119] Art. 31 (c) of WTO/TRIPS: "the scope and duration of such use shall be limited to the purpose for which it was authorized, and in the case of semi-conductor technology shall only be for public non-commercial use or to remedy a practice determined after judicial or administrative process to be anti-competitive".

might be needed.

V.2.3 Anti-trust Control of IPR Abuse in Standardization

Art. 40 of TRIPS provides that Members may adopt appropriate measures to prevent or control an adverse effect on competition in a relevant market through IP abuse. Developing countries could make full use of this provision either through competition law or an independent measure to provide anti-trust control of IPR abuse in standardization.

(a) A Practical Solution to Compulsory Licensing as a Remedy for Refusal to License

Developing countries may be able to learn from the actions of the EC in the Microsoft case with regard to refusal to license key interface information in standards. However, mere duplication of this specific case would have limited results. SUN could have obtained and distributed the technical input to other countries, making any duplications of the Microsoft case unnecessary. However, if Art. 40 of TRIPS is to be made more workable and meaningful, the jurisdiction in the Microsoft case should be extended and generalized by addressing the following question: What constitutes "exceptional circumstances"? It is therefore necessary to explore the overarching jurisprudence for compulsory licensing under competition law, at least for ICT standardization. In this respect, the Essential Facilities Doctrine (EFD) may deserve exploration as to its applicability in similar cases.

According to the EFD doctrine, if a facility is deemed necessary for fair competition and of great interest to society but at the same time cannot be produced by competitors for economic reasons, the owner is obliged to grant access to this facility on reasonable terms. The EFD principle has been invoked to justify compulsory access to bottle-neck facilities such as railway terminals.[120]

In the context of ICT standardization, IPR, especially those in interfaces, could easily be viewed as an essential factor for competition. Refusal to license the key interface technologies by dominant firms harms fair competition and interoperability of ICT systems. Accordingly, if the justifications for compulsory access to railway terminals have held, it should also be the case for ICT systems, especially those which are dominant and to some extent functioning as part of the ICT infrastructure. However, currently the U.S. judiciary is seeking to avoid invoking EFD and when there is a compelling need to grant access, something else is used. For example, in a case related to access to telecommunications networks, the U.S. Supreme Court invoked an access provision in the Telecommunication Act. With regard to EFD, the Court stated: "We have never recognized such a doctrine ... and we find no need either to recognize it or to repudiate it here."[121] In the 2004 EC Microsoft case, the EC also avoided controversies regarding the applicability of EFD to IPR.

The Essential Facilities Doctrine could be applied to IPR cautiously to avoid undue disincentive on R&D. From the perspectives of both the integrity of jurisprudence and the practical need for ensuring interoperability, it is not a proper choice for developed countries to abandon EFD in order to favour IPR owners. As former Chairman of the FTC, Professor Pitofsky stated: "If U.S. scholarship were the last word on the subject, one would be led to conclude that the essential facilities doctrine should be described narrowly or fully abandoned. U.S. courts, however, when faced with real instances of monopoly dominance, have not been so grudging in application of the doctrine. All agree that access should be accorded cautiously, with several qualifying conditions; none concludes that the

[120] United States v. Terminal Railroad Ass'n of St. Louis, 224 US 383 (1912), Aspen Highlands Skiing Corp, 472 US 585 (1985).
[121] Verizon Communications Inc. v. Law Offices of Curtis V. Trinko, LLP US 02-682 (2004).

right course is to abandon the doctrine altogether"[122] European scholars also share the same idea even though they do not mention the term EFD.[123]

A practical solution may be to identify the factors needed to constituting "exceptional circumstances" and to apply them as an overarching principle in similar cases. For this purpose, what the EC did in the Microsoft case may be valuable. In EC Microsoft case, several factors have been identified: 1) information compulsorily licensed is limited to specifications of protocols to interface, with which reproduction of products is not feasible; 2) a disruption of previous levels of supply; 3) risks eliminating competition in the relevant market when the refused input is indispensable for competitors operating in that market; 4) no actual or potential substitute for the refused input; 5) refusal to license limits technical development to the prejudice of consumers.[124]

(b) Stricter Anti-trust Scrutiny on Patent Pool Arrangements and Modularization of Licensing

Though patent pools may have already got assurance from the competition authority, they are still under anti-trust scrutiny.[125] Firms in developing countries could apply for anti-trust examination of patent pools. Foreseeing financial and other practical difficulties when submitting due information in line with requirements of competition authorities and the possible jurisprudence bias in favour of IPR owners, developing countries may find it is necessary to initiate their own anti-trust examination mechanism on patent pools. At the same time, it might be potentially meaningful for competition authorities in both developing and developed countries to collaborate on anti-trust examination of patent pools since developing countries may have more evidence with regard to anti-competition practice and effects of patent pools.

As a policy consideration on patent pools this paper proposes the modularization of licensing where sub-packages of IPRs or even individual patents are available on the menu for licensees. Occasionally, practical and legal problems occur with patent pools if all the IPRs necessary for implementation of one standard are licensed in one package. Many manufacturers do not necessarily need all the IPRs since they may have their own technologies and, if these IPRs are part of a package deal, manufacturers are forced to buy what they do not need. Furthermore, a package deal may also be anti-competitive since alternative technologies may not be able to compete with those in the package.[126] One way to deal with the practical and legal problems could be modularization of the licensing where sub-packages of IPRs or even individual patent are available on the menu for licensees.

Modularization licensing would indeed create additional transaction costs for licensing. However, this may be preferable to paying for technologies the licensees may not need. It could also

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[122] Robert Pitofsky, Donna Patterson, and Jonathan Hooks, "The Essential Facilities Doctrine under U. S. Antitrust Law," *Antitrust Law Journal,* 70 No. 2, 2002.

[123] Max Planck Institute for Intellectual Property, Competition and Tax Law, "Comments of the Max Planck Institute for Intellectual Property, Competition and Tax Law (Munich) on the DG Competition discussion paper of December 2005 on the application of Article 82 of the EC Treaty to exclusionary misuse", Munich, 31 March 2006, available at http://www.ip.mpg.de/shared/data/pdf/comment1.pdf (accessed: Feb. 28, 2009). ("[i]n standardization cases, a duty to license with the objective of allowing competition by imitation should not be excluded in principle.").

[124] European Commission, supra note 17.

[125] Together with its issuance of Business Review Letter, the U.S. DOJ indicated explicitly that "[i]n accordance with our normal practices, the Department reserves the right to bring an enforcement action in the future if the actual operation of the proposed conduct proves to be anticompetitive in purpose or effect." U. S. DOJ Business Review Letter for MEPG LA, available at http://www.usdoj.gov/atr/public/busreview/letters.htm (accessed: April 25, 2009).

[126] See relevant provision in European Commission, supra note 75 ("Where non-essential but complementary patents are included in the pool there is a risk of foreclosure of third party technologies. Once a technology is included in the pool and is licensed as part of the package, licensees are likely to have little incentive to license a competing technology when the royalty paid for the package already covers a substitute technology. Moreover, the inclusion of technologies which are not necessary for the purposes of producing the product(s) or carrying out the process(s) to which the technology pool relates also forces licensees to pay for technology that they may not need. The inclusion of complementary patents thus amounts to collective bundling.").

be an important way to foster innovation by placing competing and especially emerging technologies on the same playing field.[127] Finally, modularization licensing would lead to more competition among sub-patent pools, leaving the thorny anti-competitive concerns of bigger patent pools to the markets.[128]

V.3 Improving Relevant Institutional Mechanisms and Governance

There are new issues arising from IPR in standards which could be addressed through institutional adjustments. These adjustments of patent data information dissemination, patent examination, lowering relevant litigation costs and evaluating patent prices based on technical contribution are merited for technical reasons and should be put into practice as soon as possible. Therefore, relevant discussions in WIPO, other international fora and national agencies should be focused on technical issues and how to put into practice warranted adjustments of policies.

V.3.1 Due Facilitations on IPR Information from IP Offices and other Agencies

Standardization requires a great amount of IPR information which is currently addressed through IPR information disclosure and patent search. However, these options do not exhaust all options for gaining relevant information. It would be very helpful if IP offices, whether national, regional or international, could provide their facilitation by drawing on their own expertise on IPR data managements.

Another important facilitation, which is currently problematic, is to share IPR litigation information related to standardization. Information on patent validity and court rulings on licensing terms in one case related to IPR in standardization would be highly useful to another standards implementer. If the publication of this valuable information is not permissible in general, flexibilities should be considered for the purpose of standards implementation.

IP offices should work more closely with SSOs to improve the quality of patent examination by filtering out patent applications based on information broadly available before the date of their filing. This is often the case for patent applications built on information gained during meetings of formal standards setting institutions. Normally, such patents would not be granted or are revoked in post grant procedures if evidence is provided. The problem is that such information is not always available to most patent offices because the minutes of Working Groups, contributions, etc. do not - with very few exceptions - form part of the normal documentation at most patent offices. Some patent offices do try to access and process such documentation for search purposes but there are still many problems such as 'public availability' or in other words of 'confidentiality' of documentation. It appears that in some formal SSOs, there are *de jure* confidentiality rules (e.g. forbidding use of the information disclosed during the consultation process for any other reason than for the standardisation undertaking), which are however not respected *de facto*. Experience shows that it is precisely during this time of 'confidentiality' that patent offices receive the bulk of applications, very often referring explicitly (citing document numbers etc.) to such 'internal' and allegedly 'confidential' documentation and this from several applicants simultaneously (cross-fertilisation). This may create patent thickets if the patent offices cannot use the underlying documentation to apply inventive-step criteria. Such ambiguous policies and the games played within such grey zones create serious trouble both to the patent and the standardisation systems. It is therefore very important that SSOs and patent offices

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[127] This is especially important in the context of module innovation which is becoming a prominent innovation character in ICT sectors. See Masahiko Aoki and Hirokazu Takizawa, "Information, Incentives and Option Value: The Silicon Valley Model", *Journal of Comparative Economics*, Vol. 30, Issue 4, 2002.

[128] For example, the question remains of how to ensure non-complementary of IPRs in a rapidly changing technical world? For these concerns, please refer to European Commission, supra note 75.

work together to clarify such issues and agree on a common denominator.[129]

Another important facilitation, which is currently problematic, is to share IPR litigation information related to standardization. Information on patent validity and court rulings on licensing terms in one case related to IPR in standardization is highly useful to another standards implementer. If the publication of this valuable information is not permissible in general, flexibilities may be considered for the purpose of standards implementation.

V.3.2 IPR Royalties Ascribable to Technical Contribution

The calculation of a royalty itself is a thorny issue.[130] In the context of standards, it is clearly unfair when a royalty is based on the sale of ICT products since one product will involve bunches of patents and the IPR owner will be "systematically overcompensated."[131] This is especially true for technologies with a small innovative contribution but proportionally large strategic value. For example, certain software codes could be technically trivial or even common sense for engineers but once they are included in the interface of dominant systems, they accumulate huge strategic value. Therefore, while market mechanisms can still be relied upon before the standard is locked in, once that market has been locked in by a standard, be it *de jure* or *de facto*, royalties will be based on intrinsic value rather than strategic value of the IPR in standard.[132]/[133]

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[129] As was encouraged in the Global Standards Collaboration (GSC): "RESOLUTION GSC-12/23: (IPR WG) Cooperation with Patent and Trademark Offices (New), GSC12_Closing_35, 13 July 2007", available at http://www.itu.int/oth/T2101000004/en (accessed: April 23, 2009).

[130] George Priest commented: "It is widely agreed that technological assessments of the commercial value of a patented invention are intractable." George Priest, supra note 75. Regarding the conflicting concepts on royalty it is said to be up to commercial negotiation based on market mechanism. See the comment by a U.S. antitrust official: "Bringing a complaint to the Antitrust Division about 'excessive' royalties, without more, is a losing strategy. Antitrust enforcers are not in the business of price control. We protect a competitive process, not a particular result, and particularly not a specific price. In fact, if a monopoly is lawfully obtained, whether derived from IP rights or otherwise, we do not even object to setting a monopoly price." R. Hewitt Pate, Assistant Attorney General, Antitrust Division, U.S. Department of Justice, "Competition and Intellectual Property in the US: Licensing Freedom and the Limits of Antitrust, Speech at 2005 EU Competition Workshop", June 3, 2005, available at http://www.usdoj.gov/atr/public/speeches/209359.htm (accessed: Feb. 28, 2009). See also the court decision in Brulotte v. Thys Co., 379 US 29, 33 (1964) ("A patent empowers the owner to exact royalties as high as he can negotiate with the leverage of that monopoly."). On the other hand, the idea that royalty should be proportionate to its technical contribution had long been recognized in judicial verdicts. In Seymore v. McCormick, 57 US 480, 491 (1853), the U.S. Supreme Court considered it a "very grave error" to calculate patent infringement based on the value of the whole where a product consists of multiple patents. See also Westinghouse Elec. & Mfg. Co. v. Wagner Elec. & Mfg. Co., 225 US 604, 614–15 (1912) ("The invention may have been used in combination with valuable improvements made, or other patents appropriated by the infringer, and each may have jointly, but unequally, contributed to the profits. In such case, if plaintiff's patent only created a part of the profits, he is only entitled to recover that part of the net gains.").

[131] Mark Lemley and Carl Shapiro, supra note 15, at p.2044.

[132] See concerned decision by the European Commission, supra note 17 ("The requirement for the terms imposed by Microsoft to be reasonable and non-discriminatory applies in particular to any remuneration that Microsoft might charge for supply; such a remuneration should not reflect the "strategic value" stemming from Microsoft's market power in the client PC operating system market or in the work group server operating system market."). See also the idea of some scholars that the "true" or underlying value of its intellectual property, "is normally best measured by adopters' willingness to pay for it when they know their alternatives and have not yet made investments specific to that technology." Joseph Farrell and Carl Shapiro, "Intellectual Property, Competition, and Information Technology", UC Berkeley Competition Policy Center Working Paper No. CPC04-45, 2004, available at SSRN: http://ssrn.com/abstract=527782) (accessed: Feb. 28, 2009).

[133] There are other points which should be taken into consideration during the calculation of royalty. Firstly, royalty tends to be over evaluated in royalty settlements. As commented by Mark Lemley and Carl Shapiro, supra note 15, at p.2022 ("Not surprisingly, license agreements that involve the payment of a large sum of money are more likely to be material—and therefore more likely to show up in a public database—than license agreements that involve a small payment, a walk away, or a cross license. Thus, as a practical matter, expert testimony about royalty rates overstates those rates because the royalties that are reported tend to be higher than the average royalty."). Secondly, it should be noted that standard help increases the reorganization of IPR. Standardization bodies as a selecting mechanism, as a

V.4 Complementary Policies

Sustainable innovation and interoperability in the digital economy are important policy objectives in an information society. To fulfil those objectives, it is essential to maintain an open ecology for ICT systems.[134] In this regard, IPR misuse must be well controlled through a forward thrust of mutual endeavours. At the same time, other tracks such as mandatory open standards policy and open source should also be actively pursued, as a complementary but by no means less important means of fulfilling policy objectives related to ICT standardization.

V.4.1 Mandatory Open Standards in Public Procurement

Governments are the major ICT technologies users in the field of e-government. In many countries, governments also have direct influence as a user in other fields such as ICT infrastructures, e-commerce and universal services. Governments could exert great leverage in demanding mandatory open standards in public procurements. This would not only create a positive atmosphere for open standards but also help open standards to accrue a critical mass of users and prevail over proprietary standards.

The mandatory open standards approach has several merits. Open standards policy has due legitimacy. It is necessary for information flow between citizens and government so as to ensure transparency and freedom of access to government information.[135] Open standards could foster fair competition and is cost saving. An open standards policy eases controversial issues of IPR in standardization such as expertise, time and fiscal costs for parties. Open standards helps ensure information security in the sense that public information networks are not be locked into closed private technology.

There has been precedent of mandatory open standards policy in Denmark and the Netherlands. Denmark has notified its open standards policy to the WTO. Developing countries should take into due consideration the merits of this policy and put them into practice as soon as possible.

V.4.2 Government Support for Open Source

Open source has been considered to be cost-effective, user friendly when making follow-up improvements and the maintenance of information security. Open source has opened a new window for developing countries to develop their own software industries with low costs and in a more self-reliant manner. Therefore, governments should consider appropriate support for open source.

"forum shopping" or "certifier", could help to enhance the recognition, acceptance, even the significance of the technology that has been selected. This technology could therefore have more business opportunity than it could have had before it was included in standards. For this point, please refer to Marc Rysman and Tim Simcoe, "Patents and the Performance of Voluntary Standard Setting Organizations", NET Institute Working Paper No. 05-22, Oct. 11, 2005, available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=851245 and Jean Tirole and Josh Lerner, "A Model of Forum Shopping, with Special Reference to Standard Setting Organizations", 2004, Harvard NOM Working Paper No. 04-31, available at SSRN: http://ssrn.com/abstract=568741 or DOI: 10.2139/ssrn.10.2139/ssrn.568741 (accessed: Feb. 28, 2009). Further, if the standard could prevail, the IPR owner could be awarded to such an extent that he could even agree to give up royalties. This is in effect the rational for royalty free licensing for IPR in standardization. For this point, see Baisheng An, "Initial Thoughts on Legal Arrangements for Intellectual Property Rights in Standardization" in Sherrie Bolin (ed.) *Standards Edge: the Golden Mean*, Shriden Books, Chelsea, MI, 2007.

[134] For relevant information on the importance of an open ecology of ICT systems, please refer to concerned publications and advocacies by Knowledge Ecology International (KEI) at http://www.keionline.org/ (accessed: March 14, 2009).

[135] For detailed explanation of the legitimacy of open standards policy, please refer to "The Hague Declaration on open standards", http://www.digistan.org/hague-declaration:en (accessed: Feb. 28, 2009).

Government support does not necessarily mean direct government investment or subsidy. Open source is more a social concept and activity of collective recreation or creative commonality than a commercial model. The purpose of government support is to promote this concept, based on which commercialization of open source commercial models could be better developed. The proper manner for government support could be to give priority to open source software in government procurements. Aside from that, government could also be needed on legal issues related to IPR in open source software. Open source is not totally IPR free. The copy-left concept of GNU is still based on copyright rather than anti-copyright. In effect, legal issues related to licensing still need to be clarified so as to avoid another form of IPR ambush in widely distributed open source software.[136] Therefore, the government could help, where appropriate, to clear off those potential legal issues.

V.4.3 Regulation on Interoperability

Jurisprudence underlining the compulsory licensing in competition law and the mandatory open standards in public procurement has implied the indispensability of interoperability, information change and fair competition. However, currently, the integrity of standardization has been maintained mainly by competition policies and SSO IPR policies. As has been demonstrated, this approach is extremely costly and full of uncertainties.

It has become more apparent that while the global community is evolving into an information society, interoperability itself is fundamentally relied upon; so much so that it has become an integrated part of public interest. In this case, interoperability could be ensured in a more efficient manner when it becomes a policy objective in itself.

V.5 Some Considerations on the Implementation of the above Initiatives

IPR in standards is a global issue, the integrity of which warrants commitment and contribution from a worldwide alliance. While the focus of this paper is on developing country concerns, stakeholders from developed countries should not be set aside. It is also important to ensure that new solutions yield substantially meaningful results for stakeholders in developed countries so as to foster positive and sustainable leverages for the integrated global digital networks.

V.5.1 Openness to Potential Contributions from Stakeholders in Developed Countries

IPR misuse is a global issue and if addressed adequately and properly, the entire global community will benefit. Therefore, even though governments in developed countries and especially trade agencies pursuing higher IPR protection may feel reluctant to discuss this issue, it should be noted that many stakeholders in developed countries, including large ICT firms such as IBM and SUN have, of themselves and in collaboration with governments in developing countries, been active in exploring meaningful solutions to tackle IPR misuse in IPR in standards.[137] Developed countries are not necessarily a solid block of resistance to change. There are some neutral points on the issue of IPR in

[136] Such as the case SCO v. IBM. According to SCO, IBM had developed the UNIX AIX based on SCO's UNIX System V. Later on IBM contributed UNIX AIX to Linux. Under the GPL licensing model, Linux, together with the source code of UNIX System V in it has been widely distributed. SCO alleged that even though SCO had licensed IBM to develop UNIX AIX based on SCO's UNIX System V, IBM violated the copyright and business secret by integrating source code in UNIX System V. into Linux. SCO also warned the world biggest 15000 companies of related legal liability if they use Linux.

[137] For example, SUN sponsored a seminar where officials from developing countries gathered to elevate policy awareness on the issue of IPR in standards. For relevant information, please visit the seminar web site at http://thebolingroup.com/collaborativeadvantage/index2.html (accessed: March 13, 2009).

standards such as information sharing between IP offices and SSOs which could be addressed in an objective manner. Therefore, developing countries should push international discussions forward into meaningful explorations for solutions. During this process, potential collaborations with stakeholders in developed countries merit the due consideration of developing countries.

V.5.2 Special Arrangements for Developing Countries

Special arrangements for developing countries are warranted in concerned policies. Sometimes, equal treatment may lead to *de facto* disadvantages for developed countries. For example, whereas new policies may place more obligations upon IPR owners, the new participants from developing countries should be exempted from the newly required obligations when they start to participate in standards that have existed for years. This is warranted simply because the original participants did not take up the newly required obligations. Therefore, equal treatment should only to be considered when new standards are developed. It might also be necessary to give firms in developing countries flexibilities such as the transitional period of compliance before mandatory unilateral *ex ante* disclosure has become a well established policy across the board so that they would be released from potential uncertainties associated with new policies. With regard to national policies on IPR in standards, developing countries should be entitled to special treatments similar with those at firm level.

VI. CONCLUSION

This research paper has illuminated IPR misuse as the core issue between standards and patents. By concealing IPR information from standardization organizations and/or by abusing the vagueness of and lack of governance around RAND commitments and "reasonableness", IPR owners can exploit down stream manufacturers with exorbitant and non-competitive royalties which harm markets in both developed and developing countries. Refusal to license the IPR covering key interface technologies in standards enables IPR owners to leverage their dominant position from one market into others.

IPR misuse in standards has caused various adverse effects on innovation and access to knowledge in developing countries. Exorbitant royalties have driven down stream manufacturers into difficult situations and often bankruptcy. In many developing countries information infrastructure construction as well as consumer access to information devices such as mobile phones, computers and the internet have been unduly hindered by high prices caused by exorbitant royalties and monopolization. Aside from that, national security will be jeopardized if IPR misuse in standards continues beyond adequate control.

This paper recommends that IP information disclosure be made mandatory at the international level. *Ex ante* disclosure of IPR information and licensing terms by IPR owners must be clarified and strengthened, preventing easy circumvention by IPR owners. Government support of open standards and open source is suggested as a complementary measure to deal with IPR misuse in standards. Furthermore, this paper suggests that governments consider direct regulation of IPR misuse in standards under regulatory frameworks.

With regard to strategic considerations, policy coordination among domestic agencies in developing countries responsible for IP, standardization and ICT industries should be accelerated. Systematic coordination between developing countries is also needed in order to take advantage of the aggregated markets and policy leverage of developing countries.

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