

A New Approach for Developing Open Standards with a More Reasonable Patent Licensing Policy

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Abstract: *For more and more new standards containing patents, the licensing policy of these patents has become the key factor determining whether a standard will be adopted by industry. RAND—the principle of ISO—has stymied the standards being adopted in some cases. While royalty free is a good answer for some areas, it is not popularly or easily agreed on. AVS (Audio Video coding Standard working group of China) enacted a new strategy of “public technical standard with pre-defined competitive-price licensing of patent pool.” It is based on organizing the open standard working group and administration committee of the related patent pool respectively so that they promote the application of the standard. This paper discusses the strategy and implementation details specifically for the case of AVS standards.*

The goal of a standard system is to provide interoperability among multiple suppliers in the market, thereby reducing costs through mass production and competition. The purpose of the patent system is to encourage investment in research and development. The reward for innovation is a limited exclusivity in the marketplace, which should provide a return on the investment of the inventor. **With an increasing number of patents in new standards, it becomes even more important for standardization and public policy organizations to balance the public benefit of standards and the private rights of patent holders.**

It is hard to avoid having possible patents in new technical standards. But, if the technical standard contains many patents, then the licensing cost may delay or kill it. One opinion is that patents contained in standards should be free, but this may cause patent holders not to withhold important technology from the standards, resulting in uncompetitive technical standards. The rights of the patent holders should be protected. However, if this leads to patent holders abusing their control over the standard through the licensing policy, then the standard will not be a public right for industry. Instead, it becomes a blown-up, private right for a few patent holders to capture the market.

This paper proposes that the public benefit from standards and the private benefit from patents should be considered synergistically. That is to say, **we must find a balance between**

the benefits of the patent holders, industry, and end-users in order to realize a winning situation for all parties.

RAND, Royalty Free, or the Third Way

The ultimate goal of standardization is to provide public benefit. This is clearly stated, for example, in the definition of a standard according to ISO—the International Organization for Standardization. The patent system has the same overall goal of providing public benefit, but it is based on the property rights of individuals or organizations. For us to meet these two goals, there must be a balance between the individual rights and the public rights.

One approach, used for the past seventy years by standards organizations including ISO, is to require that technology used in a standard be licensed under “reasonable and non-discriminatory” or “RAND” terms. The problem with this approach is that there is no definition of “reasonable.” In the worst case, standards have been killed by licensing terms that neither patent holders nor users of the standard considered reasonable.

The W3C (World Wide Web Consortium) has taken a different approach with its “Royalty Free” or RF licensing policy. W3C members must commit to RF terms in order to have their technology adopted into W3C standards. A representative case is the XML Schema specification from Microsoft, which W3C adopted after Microsoft agreed to accept RF terms.

AVS’s basic idea for patent licensing is different from RAND and RF. The Science and Technology Department of Ministry of Information Industry approved and established the AVS Workgroup (Audio Video coding Standard Working Group of China) in June 2002. The goal of the working group is to establish the standard for compression, decompression, manipulation, and display in digital audio and video multimedia equipment and systems. This standard applies in fields such as high-resolution digital broadcast, high-density laser-digital storage media, wireless broadband multimedia communication, and Internet broadband stream media. Experience in drafting the AVS standard revealed that **the technical standard and potential patents must be synergistically considered to balance the benefits for the patent holder and the industries that implement the standard.** AVS does not oppose the inclusion of patents in the standard, but the member that contributes a proposal must disclose the patents in it and the licensing intentions (RF, AVS patent pool, or RAND). The working group decides to adopt a proposal or not based on two factors: (1) visible technical contribution and acceptable implementation complexity; (2) whether the member selected RF or the AVS pool when there is a patent. Here, the AVS patent pool is similar to traditional pools but obeys the pre-defined competitive-price licensing by AVS IPR policy.

Patent Pool

A patent pool is an agreement between two or more patent holders to collectively license their intellectual property. The original goal for a patent pool is to reduce the licensing cost and to promote industrial development of new applications in the market. An early example is the

pool established by the Radio Manufacturers Association in 1924.

Patent pools are a method for licensing essential patents in standards. A patent pool for standards usually has the following basic features:

- A well-defined standard
- An independent evaluator determines which patents will be infringed by the standard implementation, and thus determines who are the essential patent holders
- A commitment by essential patent holders to license their essential patents—this permission should at least follow the RAND principle
- A patent pool administration, appointed by essential patent holders, responsible for managing the patent pool
- Essential patent holders retain the right to license their patents outside the patent pool

Essential patents should meet the following criteria:

- The patent should be valid
- The patent should be strictly essential
- No overlap—only one patent for each distinct technology
- An essential patent should be replaced or deleted when new technology can substitute for it

Some patent pools today do not follow these principles of essentiality and non-overlapping patents, raising concerns that the intellectual property system will be abused and anti-monopoly law will be violated. In practice, however, a successful standard is used in most or all of the market. It thus forms a de facto monopoly. In addition, patent holders control the patent pool, therefore they may use it against competitors outside the pool. In that way they can maintain high profit levels for those inside the pool by obstructing the reduction of prices in the market that normally result from open competition.

In the last 10 or 20 years, the traditional development and production chain from R&D to manufacturing has changed. Companies have become less vertically integrated and globalization leads to manufacturing in other countries. This has led to lower profit margins on product development and manufacturing, which in turn has led some major multinational companies to focus on licensing revenue. In addition, some small companies with little technology have exploited the adoption of that technology in standards to demand very high licensing fees. This focus on licensing has led to the creation of companies who base their business solely on patents and licensing. These companies have an interest in maximizing their revenue from patent licensing, which is against the interests of industry and end-users.

Case Study: MPEG

Moving Picture Experts Group (MPEG) is a working group of ISO/IEC in charge of the development of standards for coded representation of digital audio and video. Established in 1988, the group has produced several standards: MPEG-1, which is the basis for such

products as Video CD and MP3; MPEG-2, the basis for products such as Digital Television set top boxes and DVD; MPEG-4, the standard for multimedia for the fixed and mobile Web; and MPEG-7, MPEG-21, and others. MPEG follows the RAND-based ISO IPR policy.

MPEG LA as originally conceived was set up to facilitate licensing of the many patents coming from many companies that were essential for the MPEG standard. The goal was to provide licensing quickly and to provide a single source for the license. This would reduce the risk and effort for manufacturers, encourage fast adoption of the standard, and facilitate quick growth in the market. MPEG LA received approval from the US Justice Department, and established a patent pool for the MPEG2 standard. Initially the license fee was \$4.00 and applied to consumer electronics products. Subsequently it was extended to include PC products and the fee was reduced to \$2.50. Since MPEG-2 was the only solution at that time, this fee was relatively reasonable and the standard was a huge success. This changed when MPEG LA announced proposed license terms and fees for the MPEG-4 standard. These would have burdened broadcasters and other companies with huge fees and were widely rejected in the industry. While MPEG LA twice modified the terms in response, the terms announced for the MPEG-4 Part 10 standard, also known as AVC, were also rejected by industry.

Underlying this situation are two problems. First, the patent pool and licensing policy were set up after the standard was released. Second, ISO only required compliance with the RAND principle. This means the essential patents were unknown and that “reasonable” terms were not defined when drafting the standard. **The licensing policy may mainly reflect the requirement of patent holders but not the industry. As a result, the standard was delayed for several years and may be useless in the end.**

AVS Intellectual Property Rights Policy

From inception, AVS studied the issues of domestic and international standardization, along with intellectual property, to develop its own intellectual property rights policy. AVS does not oppose including intellectual property in the standard, but it has set up certain conditions for such intellectual property. The AVS IPR policy considers the issues of patents and licensing in parallel with the development of the technical work of the standard. This means that while decision-making is happening, the existence of IPR in the standard (as much as is possible), the licensing policy, and the commitment of patent holders is known. The licensing will then be available as soon as possible after finishing the standard.

AVS defined a “standard” to be the product of one of its subgroups. This enables AVS to register which organizations participated in the subgroup and therefore the standard. Participants have certain obligations to commit to licensing and declare default terms for licensing their essential patents. Further, organizations contributing to the standard must disclose their intellectual property and their licensing terms for that contributed technology. Figure 1 summarizes the policy:

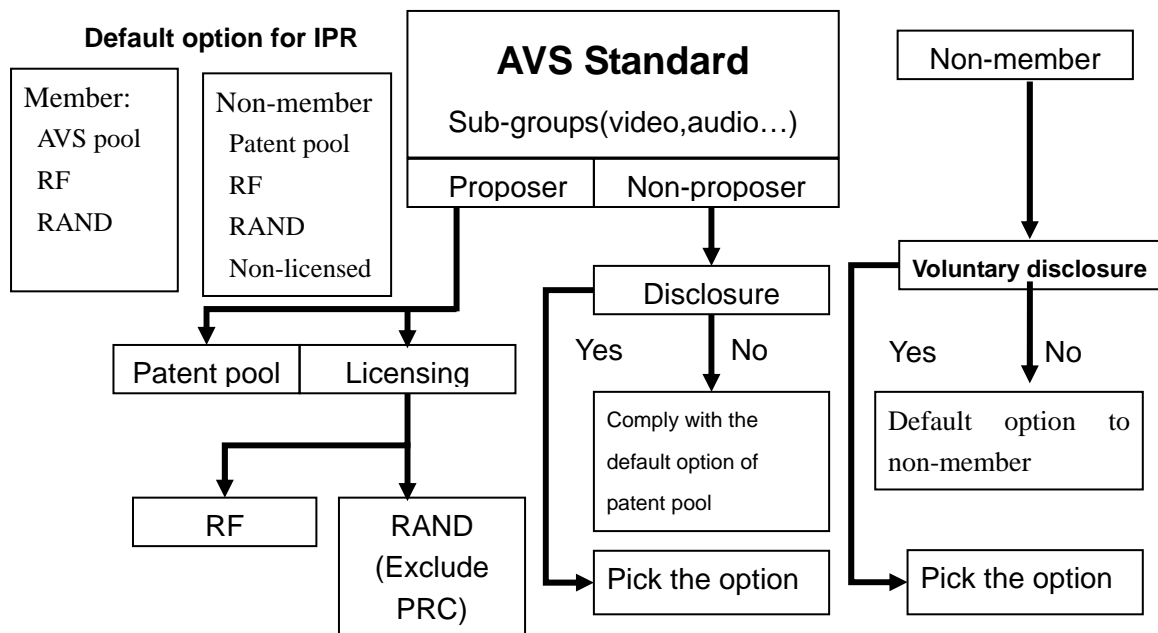


Figure 1: The summary of AVS intellectual property rights policy

The AVS subgroup can then make decisions about adopting contributions that consider licensing as well as other factors. The licensing terms are ranked by favorability in the IPR policy. For example, if two contributions are essentially equal in their technical merit, the subgroup may adopt the contribution with a more favorable licensing commitment.

AVS also supports the establishment of an AVS patent pool based on the principals of non-discrimination, voluntary participation, and non-exclusivity. The pool will license only truly essential patents. The pool should provide users with a single place to get a license for all essential patents, and therefore will attempt to attract all patent holders to participate. There will be a balance between a low license fee to meet the needs of the market and a fee high enough to attract all license holders. The huge volume in the market for AVS products will offset a low fee and provide a reasonable return for patent holders.

Conclusion

In response to the chilling effect patent restrictions have had on global standards, AVS has prepared an IPR policy that defines procedures for developing the technical work and licensing work at the same time. AVS accepts advanced patented technology in its standards, while asking for reasonable licensing restrictions in order to guarantee public welfare and advancement of the standard.

Standards must consider both the technical work and patent licensing to make a winning balance between the standards developers, patent holders, and end-users. The authors of this paper put forward the strategy for standardization combining open technical standards with

lower-price patent pools. We suggest organizing an open standard working group and administration committee for the patent pool that works interactively to encourage adoption of the standard.

AVS has avoided the prior situation—a world in which only the standards organization takes responsibility for the standard, the patent holder establishes the license policy after the standard is issued, and industries wait passively. The AVS approach will provide a reasonable return on investment for patent holders, lower costs so that manufacturers can quickly establish a healthy mass market, and help to ensure that the best products and price are available to consumers.

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Dr. Tiejun Huang is the director of the Research Center for Digital Media of the Graduate School and a researcher of the Institute for Computing Technology in the Chinese Academy of Sciences, the secretary-general of the Audio and Video Coding Standard working group of China (short for AVS). He received his PhD degree from Huazhong University of Science and Technology in 1998 and master's and bachelor's degree from Wuhan University of Technology in 1995 and 1995, all in computer science. Dr. Huang's interesting research includes digital media processing and understanding, digital library, video compression and HCI. He is the principal investigator of about ten research projects sponsored by the national Sci&Tech organizations such as the China National Hi-Tech Research and Development Project.

Dr. Wen Gao received his Ph.D. degrees in computer science from Harbin Institute of Technology, China, in 1988, and in electronics engineering from the University of Tokyo, in 1991 respectively. He joined the faculty of the Harbin Institute of Technology since 1985, served as lecturer, professor, chairman of department of computer science. He is joining with Institute of Computing Technology, Chinese Academy of Sciences, since 1996, served as professor, chief scientist, managing director. From year 2000 to 2004, he was pointed as Professor and Vice President in Graduate School of Chinese Academy of Sciences, as well as in University of Science and Technology China. He has published four books and over 300 technical articles in refereed journals and proceedings in the areas of multimedia, data compression, face recognition, sign language recognition and synthesis, image retrieval, and multimodal interface. He has earned three secondary national awards of science and technology achievement in 2000, 2002 and 2003. Dr. Gao was visiting scientist in the Robotics Institute, Carnegie Mellon University, in 1993, visiting scientist in the MIT AI Lab. in 1995, honorary professor in department of computer science, City University of Hong Kong from 1995 to 1997. He is adjunct professor in University of Science and Technology Hong Kong, from 2004. He served as the vice chairman of Chinese Association of Image and Graphics, the vice chairman of Chinese Association of Software Industry, the editor for several journals such as the editor-in-chief of Journal of Computer(in Chinese). Dr. Gao is a leader in some

national R&D activities since 1992. He served as the chairman of steering committee for intelligent computing system in 863 Hi-Tech programme from 1996 to 2001. He is the head of Chinese delegation to MPEG. He also is the chair of AVS working group which is an entity to make and evaluate the national standard for audio/video coding system.

Cliff Reader received his B. Eng. Degree from University of Liverpool, England (1970) and his PH.D. degree from the University of Sussex England (1974). His thesis topic was Coding of Still and Moving Pictures, and concerned both block-adaptive transform coding and the first application of block transform coding to video. He is currently consulting to a number of major US corporations and to the Chinese Academy of Sciences. Dr. Reader has been active in MPEG since 1990, holding the positions of US Head of Delegation (1991-1992), and Chairman of the MPEG4 subcommittee (1993-1996) among others. He was the technical expert for CableLabs in setting up the MPEG patent pool, and has published numerous papers in the field.

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