

AI AND STANDARD ESSENTIAL PATENTS: THE MPAI EXPERIENCE

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SUMMARY: 1. The origin of standards and the role of Standard Setting Organizations – 2. The Inventive Loop and the importance of rewarding companies that waive their exclusive rights to make their patented technologies available within standards – 3. RAND forever or are other business models possible? MPAI and the invention of the FrameWork License – 4. The main improvements offered by the MPAI Statutes to the licensing ecosystem – 5. Conclusions.

ABSTRACT: while standards bodies like ITU and ISO/IEC have a long history of promoting innovation and economic growth, their own structures have not kept pace with technological development and the changing objectives of their participants. IPR policies based on the traditional RAND (Reasonable And Non Discriminatory) commitment can no longer handle a membership focused on Standard Essential Patent (SEP) returns. Other issues have emerged with the RAND pledge: it is contention-prone; it is not matched by an implementer's equivalent good faith duty to negotiate; it can accept the co-existence of multiple competing patent pools covering the same standard; etc. The leading standards body developing organization for artificial intelligence, MPAI, has addressed these concerns. MPAI participants agree a Framework License (FWL) for MPAI-essential patents which refrains from setting specific values (for instance, royalty rates), but which can establish ground rules, such as that aggregate royalties for an implementation cannot exceed the royalty burden for similar technology. MPAI processes also facilitate the early introduction of pool formation. These novel elements of its IPR Guidelines will be a strong foundation for MPAI's success while bolstering the so-called "Inventive Loop".

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I. The origin of standards and the role of Standard Setting Organizations

There is no life without standards. Even the simplest microorganisms rely on a standard set of “characters” (nucleotides) expressed by four molecules (adenine, thymine, guanine, and cytosine) to run their life. There is no social life without standards. Human language and writing are examples of standards, and so are the other forms of the long history of communication.

Some think that conformance with a standard is a constraint. It should instead be considered as an enabler. A language is the common asset of a community and is smartly used by individuals to achieve remarkable interactions with others. Other individuals use the same language but fail to establish meaningful human relationships.

The formation of standards is particularly noteworthy. Sometimes, the use of a particular language can become prevalent as a result of wars and the use of a particular unit of measure can be the result of the dominant commercial position of a country. The delegates of the French National Assembly, steeped in the ideals of Enlightenment and Reason, adopted a rational system of weight and length measures, but this new rational system of measure was propagated throughout Europe via the usual channel of armies.

A new way of introducing standards came to the fore in 1861, when for the first time some countries agreed to cede part of their powers to an international entity called International Telecommunication Union (ITU) so that telecommunication standards could be developed and agreed. Another international organisation was created in 1906 when sixteen countries sent delegates to London to set up the International Electrotechnical Commission (IEC). The International Standardisation Association, established during the inter-war period, was disbanded after World War II, and replaced by the International Organisation for Standardisation (ISO), an association constituted under Swiss law.

Nowadays, we have fortunately less examples of standards imposed with the force of arms, but many examples of technical standards resulting from commercial, or other market influences, can still be found.

Many technical standards are developed by the three international

organisations IEC, ISO, and ITU and their regional and national counterparts, some of which have achieved a de facto international status. It is important to review how these three international organisations operate.

Originally, ITU was composed of national administrations, but now companies can also become members. Projects for the development of new standards are approved and developed by technical groups. When the draft standards are considered mature, they are passed to the higher body which may approve the draft as a recommendation (ITU word for standard).

Unlike ITU, which formally is a treaty organisation, and an agency of the United Nations, IEC and ISO are private associations constituted under Swiss law. Their organisation is based on a Central Secretariat that answers to the national standards organisations (called National Bodies). The task of developing a standard is assigned to a Technical Committee that oversees a specific technical domain. Typically, as a Technical Committee grows in importance, it delegates the task of standards development to Working Groups. In a further phase of growth, the structure of a Technical Committee may include Subcommittees.

Clearly there is no problem if an organisation grows when its growth is required for accomplishing its mission. However, problems arise if, as substantive technical work moves to the lower layers, the topmost layer often becomes a place where futile discussions go on and on for hours on matters that most people would consider evanescent. Worse problems are caused by the lack of proper governance for such an organisation. The operation of IEC and ISO was designed in the first years after World War II, in a context where almost everything one can conceive was so different from today. For instance, telephony was still a scarce asset, intercontinental communication was based on short waves, fax would take decades to become a practical device, email did not exist, and the web had not even been conceived.

The governance of IEC and ISO Technical Committees and below is in the hands of a Secretariat run by a National Body with sweeping powers given by the ISO/IEC Directives, probably because of the limitation of the post-war days when ISO was created. A Secretariat is typically assigned to a country that has a primary role in the area for which standards

are intended, thus reinforcing the dominant role of the country in a technical area. One would then expect that the role of a Secretariat should be well regulated, but no: the Directives, robust documents totalling more than 150 pages, go into lengthy details when dealing with procedural matters but assign less than a page to the remit of Secretariats.

All organisations are built to respond to the needs of a time. In the past, time ticked slowly, but now its pace is accelerating. Some 30 years ago, most of the companies participating in ICT standards development expected to also be users of the standards for their own products or services. Now, many of them do not intend to use the standard. They attend only because they have patents or other intellectual property that may be useful for the standard to be developed. To ensure that patented technologies are available to those implementing standards, standards bodies have adopted IPR policies requiring that participants in standard setting organizations make patent licences available on reasonable and non-discriminatory terms (RAND).

The problem, however, is that the application of the RAND policy by standards bodies is not a match to standards users' needs. Up to some 30 years ago entities offered their IP because they needed a standard to sell more products on a wider scale. They expected to have, through their sales of products or services, a decent return on their investments including in R&D, production, marketing, etc. Companies are increasingly motivated to advocate the inclusion of their IP in a standard simply because they want to populate standards with their IP to maximise their returns on their R&D investments based on the generated IP. Considering the evolving nature of technologies, processes, and markets it is important to reassess the elements of the "Inventive Loop" to ensure that the standards development process remains effective and relevant.

2. The Inventive Loop and the importance of rewarding companies that waive their exclusive rights to make their patented technologies available within standards

Standardization and the patent law framework are the twin pillars supporting the innovation ecosystem, a fundamental driver of economic

development and societal wellbeing. The first pillar – standardization – supports key innovations such as 5G, IoT and AI, where technical standards enable different infrastructures, services and devices to interoperate. This facilitates the diffusion and widespread deployment of new technologies on the market and avoids the risk of consumer lock-in to competing, proprietary solutions. The second pillar of the innovation ecosystem – patent law – has guaranteed adequate rewards to innovators, allowing broad diffusion of information on technological developments, and market access to implementation of these developments based on licensing on fair conditions.

Over the years, the role of the patent law framework has changed. In the past patents and other intellectual property rights served as a legal tool, through exercise of their exclusive rights, to create a competitive barrier of entry in the market so that, during a patent's term, the innovator alone could exploit its invention. More recently, these rights also represent an important asset for generating revenue for the innovator. Through licensing activities, revenue from royalties paid by others for the use of a patented technology (incorporated into a standard) can be re-invested in new R&D efforts. This creates a self-sustaining cycle called “Inventive Loop”; where the economic results of a patented innovation can finance new research to develop further innovation.

The Inventive Loop business model is equally applicable to large or small businesses, in the public or private sector as well as universities. It ensures a continuous flow of capital to support innovation through research and development activities. It applies as well across the twin pillars of the innovation ecosystem: it is a central consideration to companies that waive their exclusive rights to make their patented technologies available for implementation within standards, opening broad new markets for implementers that take licenses for the patents underlying those innovations.

By contributing their patented technology to the standard, companies agree to forgo the right under these essential patents (SEP – Standard Essential Patents) to use them solely for their own proprietary purposes and agree to license them on terms that are reasonable and non-discriminatory. The RAND (sometimes “FRAND”) commitment offered many advantages to standards development, implementation of

new standardized technologies and rewards to innovators. The RAND commitment aims to ensure that standardized, interoperable solutions are implemented, benefiting both SEP owners and licensees; it prevents patent owners from blocking the market (by engaging in hold-up behavior) and guarantees that SEPs are licensed under fair and reasonable terms. In this way, implementers can enter new markets and patent owners can be rewarded with a reasonable economic return for their R&D investments, providing funds for further innovation.

However, over the years, the RAND commitment has also created issues, such as the perceived over-declaration of SEPs before standardization bodies, concerns as to whether declared SEPs are truly essential and, above all, the means to determine a RAND royalty rate. Furthermore, the RAND commitment is a unidirectional obligation, imposed on SEP holders, and benefiting implementers alone. In fact, implementers are not currently bound to any commitment mirroring the RAND obligations (for example, a duty to negotiate a license in good faith), and they often adopt hold-out strategies which have a negative impact on royalty revenues, distort the playing field (refusing to negotiate when competing implementers have already accepted RAND licenses) and potentially hinder further innovation. It was in the light of these concerns that MPAI took a different approach in establishing its IPR policy.

3. RAND forever or are other business models possible? MPAI and the invention of the FrameWork License

Artificial intelligence-based products, services, and applications are bound to dominate the ICT market in the next decades. They will need standards but, as set out above, current standards bodies are inadequate for today's challenges. Moreover, over time a need has been identified to overcome some uncertainties generated by the RAND commitment and other IPR-related problems which so far have accompanied high-tech standardization.

The opportunities offered by AI, and innovation in SEP licensing are the main reasons behind the creation of Moving Picture, Audio,

and Data Coding by Artificial Intelligence (MPAI), a new, international, unaffiliated, and non-profit standards developing organisation which has adopted an IPR policy that reaffirms the Inventive Loop and, through a FrameWork License, reduces the frictions in patent licensing caused by policies based on the RAND commitment.

MPAI's mission is to promote the efficient use of data by developing technical specifications of 1) coding and decoding for any type of data, especially using new technologies such as artificial intelligence, and 2) technologies that facilitate integration of data coding and decoding components in information and communication technology systems.

This first element comprises the notion of data, “the oil of the 21st century” and of coding, i.e., the format of data. Data has value to the extent its format is known, and data changed to another format may have more value. As in the case of oil, there is value in refining data. With AI many forms of data transformation can be found; a speech utterance can be transformed into text; the expression of concern in a face can be identified, the number of bits to represent an image or a video can be reduced, anomalies in data can be detected and terabytes of data may tell the future of a company.

In addition, MPAI's ambition is also to bridge the gap between its technical specifications and their practical use through the development of new Intellectual Property Rights Guidelines (IPR Guidelines)⁽²⁾. For the licensing of intellectual property rights essential for each MPAI standard, MPAI Primary Members agree to adopt a new intellectual property management model called the “FrameWork License” (FWL)⁽³⁾.

Unlike standards developed by other bodies, whose IPR policies typically call for licensing based on vague and contention-prone RAND declarations, MPAI standards are based on the FWL, which establishes, already at the outset of the standardization activities, the guidelines for future licenses

(2) MPAI Statutes, Art 3 (MPAI governance documents, its standards and other materials are available at mpai.community).

(3) The FrameWork License is described in the annex to the MPAI Statutes and in its Patent Policy found on the website of MPAI. The website also includes commentaries on the FrameWork License, for example R Dini, *FRAND forever? Or are there other business models possible: What is the Framework License (FWL)?* A FrameWork Licence implementing the requirements of the Statutes has been developed, for example, for MPAI's standard MPAI-MMCV2, available at MPAI-MMC V2 Framework Licence – MPAI community.

relating to MPAI-essential patents. Thanks to these guidelines, more precise than the vague admonition of RAND, and established during the standardization process, MPAI's objective is to help both the SEP holders and the implementers of the standardized AI technologies to find more speedily, and with less contention, an agreement for the use of such SEPs.

Practically, the FrameWork License is a business model under which SEP holders have assurance of reward, but without specifying precise values: no specific figure for royalty rates, no percentages, no dates etc. At most, the FWL could provide that, in individual cases, there is a cap for the royalties to be paid, or an initial grace period, royalty-free, to foster the adoption of the technology by the market, and so on. Furthermore, as another guideline, the FWL states that the total cost of the licenses offered by SEP holders will be in line with the total cost of the licenses for similar standardized technologies and will take into account the value on the market of the specific standardized technology.

4. The main improvements offered by the MPAI Statutes to the licensing ecosystem

Since its inception in September 2020, MPAI counts among its achievements both the completion of significant technical work within the AI domain and the practical implementation of its IPR Guidelines. The focus of this paper is on MPAI's IPR policy, but it is important to note that MPAI, in its standards development, has developed nine Technical Specifications (on AI app execution, governance of the MPAI ecosystem, enhanced audio, connected autonomous vehicles, financial data, multimodal conversation, neural network watermarking, and portable avatars), two Technical Reports (on Metaverse Functionalities and Profiles), Reference Software for three Technical Specifications, two Conformance Testing and one Performance Assessment. Support to the establishment of a patent pool has also been provided.

In its complementary work on FrameWork Licenses and the establishment of a patent pool, MPAI companies have drawn on the licensing experience for earlier standards, notably on the patent environment for video codecs developed within MPEG. The environment was based

on the now familiar structure of commitment to RAND licensing and disclosure of SEPs for publication in an SDO database, followed (in the case of video codecs) by the formation of patent pools under management of commercial licensing administrators. The modern era of pooled SEP licensing started with the launch of the MPEG2 pool in 1997. Over time, this model became contested, due to:

- disputes – perhaps inevitable – between SEP holders and implementers, brought to courts and other authorities asked to give a more precise definition of “RAND” and to address the other elements of the RAND commitment (e.g., ability of a SEP holder to enforce its exclusive rights; adequacy of its disclosure to the standards body);
- the asymmetry of the SEP holder’s commitment (RAND licensing) without a matching obligation that the implementer was to negotiate in good faith (and not engage in “hold-out”); and
- the weakening of the “one-stop shop” principle for SEP licensing, a chief benefit of patent pools, by pool administrators forming rival pools covering a single standard (e.g., for the HEVC video codec).

Coupled with these developments, unfavorable to the RAND / multiple pool models, were a series of judicial decisions, notably issued by the US Supreme Court, undermining patentee rights and so discouraging innovation.

Based on this experience, the MPAI companies committed in the MPAI Statutes to rectify some of those deficiencies. Their objectives included providing timely and comprehensive information to the market on the total royalty cost associated with an MPAI standard, fewer incentives to engage in delaying tactics in negotiation, and restoration of one-stop shop pooling to reduce friction in licensing.

First, in the chronology of standards development and related activities, the Statutes give prominence to licensing of MPAI-essential patents. In this regard, MPAI differs from other standard developers. Due to antitrust concerns, standard developers generally disclaim any role in commercial licensing (other than establishing the amorphous RAND obligation). Instead, the MPAI Statutes call for early agreement on a Framework License for each of its standards.

Each Framework License establishes the parameters for negotiation; it does not set the precise commercial terms such as monetary consideration (royalty levels), percentages, thresholds, etc. These are to be settled by the negotiating parties, away from MPAI the standards developer; the parameters are rather a starting point for their discussion focused on specific values. The Statutes do specify, in a manner permitted by competition law, the expected aggregate royalty for an MPAI standard. The Statutes provide:

“The text of the Framework License will, at least, state that the total cost of the licenses issued by IPR holders will be in line with the total cost of the licenses for similar data coding/decoding technologies and will take into account the value on the market of the specific standardized technology”⁽⁴⁾.

The early adoption by MPAI participants of a Framework License gives greater certainty that the full terms of the license, including information on the aggregate royalty cost, will be promptly delivered to implementers. While not a complete solution, MPAI founders wrote in 2021⁽⁵⁾, the Framework Licenses:

(...) facilitate at least one beneficial path forward. Significant differences in business models between adopters no longer dominate the standard discussions. Evaluation of functional and commercial requirements need not be undermined. FWLs instruct use cases and conditions, not specific costs.

Second, the Statutes also address the deficiency in the current SEP licensing environment caused by implementers engaged in tactics designed to delay the conclusion of licensing negotiations (called hold-out or efficient infringement). The Statutes expressly provide:

“Each Member shall declare it will enter into a Licensing agreement for the Standard Essential Patents (SEP) held by other Members, if used, within one year from the publication by IPR holders of their Licensing terms”⁽⁶⁾.

(4) MPAI Statutes, Annex para. 8.

(5) L. CHIARIGLIONE et al, *AI-based Media Coding and Beyond* (2021), available at <https://www.ibt.org/download?ac=18820>.

(6) MPAI Statutes, Annex para. 15.

This one-year time frame puts a cap on the risk of “hold-out”. As a further incentive for taking up a license, the MPAI Statutes provide that only licensees of MPAI-essential patents are entitled to use the MPAI name and logo on their products and services implementing MPAI standards⁽⁷⁾.

Third, MPAI companies reaffirm a commitment to patent pooling. The Statutes provide that those that have responded to a call for patents essential to an MPAI standard may by a two-thirds majority select a pool administrator⁽⁸⁾. MPAI press releases in March and May 2022 demonstrate how MPAI and its SEP holders have managed the early stages of this selection process for its first standards⁽⁹⁾. While it is possible that a pooling effort by holders of MPAI-essential patents may not overcome the problems encountered by HEVC and more recently by VVC, the clear statement in the Statutes, and other early action by MPAI, may be successful in forming a true one-stop shop for MPAI licensing.

5. Conclusions

MPAI is addressing the hurdles that the ambiguous RAND assurance has encountered. It achieves this goal while recognizing that intellectual property rights are the engine that ensures and sustains technological innovation. Its FrameWork License, the good faith commitment of implementers, pooling and other elements of the novel MPAI’s IPR ecosystem will help to reduce friction between innovators and implementers. At a time when the introduction of technologies based on artificial intelligence is facing market, regulatory and ethical challenges, MPAI and its participants have taken the lead in showing how an effective approach to handling patent licensing issues can reduce frictions in commercialization.

(7) MPAI Statutes, Art. 12.

(8) MPAI Statutes, Annex para. 25.

(9) MPAI, *MPAI issues a Call for Patent Pool Administrator on behalf of the MPAI-CAE and MPAI-MMC patent holders* (Geneva, 24 Mar 2022) and MPAI, *Patent pool being formed for four MPAI standards* (Geneva, 18 May 2022), each available at <https://mpai.community/news/press-releases/>.

