

IP developments, patenting and licensing with SEPs and SSOs helps SMEs

Unjustified criticism against so-called patent thickets is now being embellished in attempts to enlist small and medium-sized enterprises and their proponents in this campaign. SMEs are helped with special treatment and handouts by governments where they are disadvantaged; but SMEs are doing relatively well, for example, in the IP-rich, hi-tech ICT sector. Patenting practices here have been [erroneously derided](#) for years. Now, SMEs in particular are the alleged victims of this emotively-described “dense web of overlapping intellectual property rights that a company must hack its way through in order to actually commercialize new technology” ([Shapiro, 2001](#)). The UK IPO’s October 2012 report entitled “[A Study of Patent Thickets](#)” and its [inconclusive 2011 report](#) on the same matter examine whether patent thickets are a “barrier to entry into patenting for UK enterprises, in particular [SMEs].” Its latest report lends only convoluted and qualified support to this notion and theories of resulting harm. In the downstream markets where products are commercialised, as highlighted by Shapiro, thousands of SMEs and many others are, instead, [flourishing by virtue of—not despite](#)— extensive IP developments, patenting and licensing of Standard-Essential Patents (SEP)s, and with Standard Setting Organizations (SSOs).

Rooting for SMEs

SMEs are a popular political cause and it would be really nice to see them developing more patented technologies and products: however, it is questionable whether their plight is any worse in fields such as ICT with numerous interrelated SEPs, than in other industry sectors, including those where patenting is less extensive and less interdependent. For



example, it is overwhelmingly very large companies who patent small-molecules for pharmaceuticals. In contrast, SEP patent disclosures and the openness for participation in SSOs by all comers provide excellent technical and commercial opportunities for SME market entry. Numerous SMEs are flourishing as software and hardware developers who build on, if not contribute to, standardized ICT technology protocols and platforms including those used extensively in mobile devices such as 2G GSM, 3G HSPA, 4G LTE, WiFi, Bluetooth, [Near Field Communication \(NFC\)](#) and [H.264/MPEG-4 AVC \(video and audio\)](#). The latter IPO report finding “overwhelming evidence in the literature that patent thickets arise in specific technology areas” is nothing more than the unremarkable confirmation that some fields, such as the above, are rich with many complex and interrelated technologies including associated patents. This alone does not mean there are any difficulties.



That SME patenting levels are relatively low in comparison to larger companies in these fields is unremarkable and consistent with SME (in)activities in general. SMEs have much lower *overall* levels, than large companies, for patenting and for R&D which is significantly required for patenting. [Empirical evidence shows](#) that the distribution of patent applications is highly skewed in terms of company size, with a few large enterprises being responsible for the majority of patent applications. According to the Inter-Departmental Business Register (IDBR) of the UK’s Office for National Statistics (ONS), SMEs accounted for [only 3.4% of the UK’s R&D expenditure](#) in 2008. In contrast to this very small percentage,

the [Federation of Small Businesses](#) reports that SMEs account for 99.9 per cent of all private sector businesses, 59.1 per cent of private sector employment and 48.8 per cent of private sector revenues in the UK.

SMEs may limit or avoid R&D and patenting for many reasons that have little or nothing to do with alleged patent thicket barriers to entry in patenting. For example, staffing commitments and financial outlays can be large, and it can take many years before innovations come to fruition – if at all given the risks – with returns on investment in product sales or IP licensing fees. [A 2010 report](#) from the Centre for Business Research and published by the IPO on the “Impact of Patent System on SMEs” did not even mention patent thickets. It concluded that small firms are less likely to use patents as a means of protecting their investment than other means such as confidentiality, secrecy or being first to market with a new idea. It found that SMEs are also less likely than larger firms to use others’ patents as a source of innovation themselves, preferring conferences and trade journals. Reasons given for these differences include the cost of filing patents and of maintaining specialist intellectual property staff. It indicated that cost and capacity pressures also explain why small firms license out more of their patents to other firms. This is precisely what SSOs foster in their development of collaborative standards. In joint research with the Massachusetts Institute of Technology, the authors found that small firms in the United States were twice as likely as those in the UK to patent innovations, but are still much less likely to do so than larger firms.

SMEs in the broader ecosystem

The development of standardised hardware and software platforms in ICT has been beneficial to both large and small companies. For example, large companies including IBM in mainframe computers, Microsoft and Apple in PC operating systems, eBay and Amazon.com in online auctioning and retailing, and Apple and Android in handset operating systems have capitalized on enormous economies of scale to build proprietary platforms that have created and led various new markets. Intel has dominated the PC computing hardware market with its proprietary x86 architecture microprocessors. Along the way, however, companies of all sizes have also benefitted technically and commercially while contributing to the large and successful ecosystems associated with these platforms. Numerous small online merchants have founded their businesses on the trading platforms provided by eBay and Amazon.com. Thousands of software product developers, systems integrators and technical support companies have based their businesses on Microsoft’s Windows and Apple’s Macs. Many manufacturers have entered the market to build PCs based on Windows and Intel’s proprietary microprocessors.

Most recently, various-sized companies including thousands of SMEs have based their businesses on developing mobile handset software applications for Apple’s iOS, Android, Windows Phone and BlackBerry OSs. Many, or perhaps most, of these are SMEs. Since the launch of Apple’s App Store in 2008, the market for downloadable programs to smartphones and tablet devices has blossomed with more than 1.5 million of these available by 2012, [according to the Sunday Times](#). One year after its formation, the [Application Developers Alliance](#) industry association boasts 20,000 developers and 120 corporate members. [It claims](#) the “development economy” has added 500,000 U.S. jobs since 2007.

The UK could play a much larger part in this global marketplace if it did [more to foster computer science education](#) and programming skills.

Opportunities for SMEs in SSOs with SEPs

The IPO's latest report stated "it is hard to envisage how firms in sectors in which patenting is very intensive would be able to enter product markets without patent protection." However, this is precisely what standards-based technology developments through SSOs in conjunction with FRAND-based licensing have accomplished in ICT including telecommunications, audio and video codecs. For example, many companies with little or nothing in the way of mobile technology SEPs have been relatively late handset market entrants. Most notable examples include HTC and Apple. UK-based [MOJO Maker Ltd](#), launched its first devices in 2011. Similarly, there are numerous DVD player manufacturers who have little or nothing in the way of patents among the 1,000 licensees of the [AVC/H.264 portfolio patent pool](#).



[A US FTC report](#) that is often cited in the patent thicket debate observed that patenting by start-ups appears to be common in some sectors. It cited a 2008 survey of high-technology entrepreneurs finding that patent ownership was widespread among responding venture capital-backed start-ups in the biotechnology, medical device and IT hardware industries, although less common in the software industry. [Lower levels of patenting in software](#) are hardly surprising where "software patents" are outlawed or open-source SSO rules demand royalty-free licensing.

The introduction of, open, standardised technologies has reduced market entry barriers for large and small companies alike in face of increasing complexities and economies of scale in ICT technology development and manufacturing. In contrast to computing hardware and software, including proprietary PC technologies, mobile handsets including smartphones and tablets are significantly more based on open standards technologies due to their more extensive use of communications, audio and video technologies.

Telecommunications and broadcasting standards used to be the preserve of national monopolies and their respective coteries of national champion equipment suppliers. Until the 1990s, international standards enabled interconnections across borders, but new national standards among nations were still being introduced in fixed line networks (e.g., with ISDN) and in cellular until the formation of various regional and global open standards. Similarly, open standards including TCP/IP and HTML are significant among extensive suites of complementary and interdependent technologies which have been collaboratively developed for the Internet and World Wide Web since then. Technologies are contributed to global standards through SSOs including IEEE, 3GPP (including partner ETSI), IETF and W3C. For example, regional standards for analogue TV broadcasting have only been retired in very recent years as global standards for digital TV (including H.264 encoding and compression) have taken over.

Whereas propriety platforms tend to concentrate associated IP in the hands a few platform owners, standards-based technologies developed through SSOs are open and have much more widely dispersed IP ownership. Standards are typically developed by consensus or

majority voting among wide and disparate SSO memberships. Technologies are licensed on the basis of (Fair) Reasonable and Non-Discriminatory (F)RAND terms, including royalty-free licensing in some cases, among numerous large and small companies. According to [ETSI's online IPR database](#) 187 companies are prepared to license their essential IP with 135,000 patents (or applied for patents) for 6,000 standards. "ETSI identifies IPRs, particularly patents and patent applications, which have been notified to ETSI as being Essential, or Potentially Essential, to ETSI Standards or Technical Specifications." According to patent pool administrator MPEG-LA, the IEEE H.264 standard has 29 voluntary licensors of 2,600 patents to 1,000 licensees. Licensing fees for all patents in the pool are capped at around 20 US cents per device. A Bluetooth patent pool licenses royalty free. These examples illustrate that even very large numbers of licensed patents does not lead to the high or prohibitively high transaction costs, as stated in the IPO's Patent Thicket report.



There is no consensus on relative IP positions in many open standards and vigorous disagreement in many cases. However, even the largest contributors only claim to have a minority of IPR for preeminent open standards. For example, Ericsson is generally recognized to be one of the leaders in LTE IP, and yet, even [by its own reckoning](#), it only has around 18% of it in LTE.

No company has anything like the level of IP ownership dominance observed with proprietary platforms such as Microsoft's Windows or Intel's x86. On the contrary, control of open standards and the technologies that get included in them is quite diffuse among many players with SEPs and increasingly so since the introduction of GSM in the early 1990s. For example, a major decision about what should be the fundamental technological basis for 3G UMTS (i.e., WCDMA or TD-CDMA) hung in the balance prior to standardisation with the initial 3GPP Release 99. Various different companies backed each technology with voting split right down the middle.

SSOs, whose standards continuously undergo numerous incremental improvements, provide various significant SME opportunities. SMEs can influence the direction of standardisation, contribute their innovations to the standardisation process and reap financial rewards from doing so as developers or manufacturers of standards-based products, or as IP licensors. For example, [ETSI](#) counts over 200 SMEs including micro-enterprises among its 758 members. According to an [ETSI survey focused on SMEs](#) 34% of 200 respondents use ICT standards and 28% use and participate in the development of ICT standards. The survey also revealed that:

- 40% of SMEs participating in the standards process indicated that they have taken a leadership position or formal role (chairman, rapporteur etc.).
- 30% of SME participants are members of three or more standards bodies.
- 50% follow three or more such bodies, and 30% have three or more people involved in standards work.
- 60% of these SMEs participate in over six standards meetings per year.
- 70% of SME participants in standardization indicated that they wished to drive the standardization process in a particular direction

- 51% indicated a need to get advanced access to the standards.

Approximately 10% of elected positions (chair, vice-chair, rapporteur etc.) in ETSI Technical Committees and Working Groups are filled by representatives from SMEs.

Open and shut case in favour of SSOs developing SEP-based technology platforms

The IPO's recent report on patent thickets identified "strong increases in the density of thickets in almost all technologies related to Electrical Engineering, Especially in Telecommunication, Audiovisual--- And Computer---technology," but "reveal[ed] a lack of empirical evidence on the effect of thickets on firm behaviour." However, its previous report provided examples of various UK SMEs who had successfully entered the market for patenting in ICT. These include Ubiquisys Ltd "holding a significant 14 patent families" in "wireless networking – handoff arrangements". It also states that MMI Research Ltd, Cvon Innovation Ltd and Ubiquisys Ltd are in "wireless networking - resource arrangements" technology with the latter two holding two patent families each. [ARM](#), with its IP business model is also a UK-based exemplar for success in the ICT sector including mobile communications in particular. The vast majority of microcontrollers (e.g., as used in cars, domestic appliances and toys) and more than than 95% of communications, applications and graphics processors included in the 1.8 billion mobile phones and tablets sold worldwide last year were based on designs licensed from ARM.

The IPO/CBR report found from survey results that SMEs in hi-tech, (e.g., including communications equipment) where the patent thickets are supposedly most prevalent, have a significantly higher propensity to rely on patents than in other sectors. In the survey's hi-tech manufacturing group, 47.9% of small firms and 74.1% of medium-size firms report rely on patents to protect IP against 37.3% and 61.6% respectively in the conventional manufacturing group.

The open and standards-based environment for ICT that has developed over the last couple of decades has been fertile technically and commercially for large and small companies including new market entrants. Standardised platforms that are widely adopted, plentiful information disclosures and development tools have enabled SMEs and others to address large market opportunities. Willingness and obligations of SSO members to license SEPs on a FRAND basis ensures universal access to these technologies. Open participation in SSOs and the incremental nature of standards development enables many different companies, including SMEs, to participate in the formulation of new standards— particularly those that incorporate numerous SEP technologies. IP-rich hi-tech markets including [mobile communications have flourished](#) as a result. SMEs and their supporters should rejoice—not resist—the existence of SEPs, the practices of SSOs and of their members in licensing.

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