FRAND Market Failure:
Analyzing IPXI’s unsuccessful attempt to establish an exchange for unitized standards-essential patent licenses

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Abstract—This case study pertains to Intellectual Property Exchange International, Inc. (IPXI), which was formed in 2008 to create a market-based trading exchange for aggregated patent license rights, particularly standards-essential patents (SEPs). IPXI based its model on existing commodities exchanges, proposing that non-exclusive patent licenses could be standardized, commoditized, and traded on an open market, thus eliminating costly and inefficient bilateral negotiations and providing a royalty rate likely to be viewed as “reasonable”. IPXI’s most ambitious offering involved a portfolio of 194 U.S., European and other patents deemed essential to IEEE’s 802.11n “Wi-Fi” standard. IPXI offered up to 50,000 tradable Unit License Right contracts (ULRs), each granting the holder a worldwide right to manufacture and sell 1,000 compliant devices. Despite the backing of several significant patent holders, IPXI’s offering failed to attract sufficient interest, and IPXI ceased operations in March 2015. This paper analyzes the failure of IPXI based on the documentary record, public statements by IPXI executives and interviews with industry experts. It concludes that, despite its potential to improve the efficiency of the SEP licensing market, factors including a lack of participation by key patent holders, an untested record of enforcing patents against infringers, and constraints imposed by the standardized ULR, led to IPXI’s demise.

Keywords—IPXI, FRAND, RAND, patent, license, standard, standards-essential patent, SEP, ULR, 802.11, Wi-Fi

I. INTRODUCTION

It is well-documented that large numbers of patents cover key interoperability standards in fields such as wireless telecommunications, computer networking and semiconductor design [2] [11]. As to any given standard, essential patents can be controlled by anywhere from a handful to hundreds of different firms. And while some patent licenses are available on a collective basis through patent pools, the large majority of patents covering technical interoperability standards are not pooled and must be licensed directly from the patent holders. Moreover, concerns over antitrust and completion law discourage much collective negotiation activity over patent licensing and royalties. Accordingly, most firms wishing to manufacture and sell standards-compliant products engage in independent bilateral licensing negotiations with individual patent holders [8].

Market participants have observed that the one-off process of bilateral licensing negotiation is time-consuming, costly, non-transparent and inefficient, in some cases taking years to conclude a single licensing transaction [16]. Due to these high transaction costs, it is believed that some patent holders may elect not to pursue licensing of their standards-essential patents, and some product manufacturers may operate without all licenses that may be legally required [9].

Moreover, even when licensing negotiations do occur, there can be considerable disagreement over royalty levels and other terms that will satisfy a patent holder’s obligation to grant licenses on terms that are “fair, reasonable and non-discriminatory” (FRAND), as required by many standard-setting organizations (SSOs) [3]. This lack of consensus has resulted in significant disputes, litigation and governmental investigations in North America, Europe, and Asia.

Finally, concerns have been raised about the potential for excessive aggregate royalty burdens on standardized products due to the independent and uncoordinated royalty demands of multiple patent holders (royalty “stacking”) [6]. It has been hypothesized that royalty stacking could lead to depressed manufacturer profits, reductions in competition, increased consumer costs and decreased consumer choice [6].

The combination of these factors has led to increasingly frequent calls for reform of the current patent licensing marketplace, both by commentators and enforcement agencies [7].

II. THE IPXI EXCHANGE

Intellectual Property Exchange International, Inc. (IPXI) was formed in 2008 to address these challenges by offering a market-based trading platform for aggregated patent license rights. The IPXI exchange model was based on that of long-standing commodities exchanges such as the Chicago Mercantile Exchange and EUREX. The commodities exchange model has brought stability and liquidity to markets for goods ranging from crude oil and precious metals to soybeans, pork bellies and concentrated orange juice. IPXI’s theory was that,

1 The synonymous term “RAND” (reasonable and nondiscriminatory) is also used frequently.
like these physical goods, non-exclusive patent licenses could be standardized and commoditized, and thereby traded on an open market. Enabling market trading for patent licenses would in theory eliminate the costly, inefficient and time-consuming bilateral negotiations that had previously characterized such transactions.

While IPXI’s initial patent license offerings focused on non-standardized technologies such as organic light-emitting diodes (OLEDs) and prepaid stored value cards (SVCs), its third and most ambitious offering involved a portfolio of patents covering IEEE’s 802.11n “Wi-Fi” standard for wireless local area networking (see Part IV).

A. Unit License Rights (ULRs) and the IPXI Exchange

The patents included in IPXI’s offerings were owned by one or more Sponsor firms, which granted IPXI exclusive rights to issue sublicenses under those patents. The basic tradable unit on the IPXI market, analogous to a purchase contract on a traditional commodities exchange, was the Unit License Right or ULR. Each ULR represented a sublicense to exercise a fixed package of rights under a specified portfolio of Sponsor patents. For example, a particular ULR might represent a prepaid sublicense under 100 different patents owned by five Sponsors in a variety of countries, and might permit the holder to manufacture and sell 1,000 devices covered by one or more of those patents. The holder of the ULR could “consume” these rights to manufacture and sell the requisite number of devices or resell the ULR on the open market.

Trading of ULRs was to be limited to IPXI “members” that agreed to abide by its rules and procedures [4]. IPXI offered varying levels of membership, ranging from no-fee “purchasing” memberships that permitted the trading of ULR contracts on the exchange, to higher level memberships that came with rights to participate on one or more of IPXI’s governance and policymaking committees.2

The price at which ULRs would initially be sold was to be determined based on bids submitted by potential purchasers prior to the closing of an offering. Once sufficient bids were received, IPXI would price the offering and sell ULRs to all bidders at the final offering price. In order to guide bidders, IPXI determined an estimated price for each ULR based on an analysis of the covered patents and relevant market factors. It was contemplated that ULRs would be offered by IPXI in up to three tranches, with the price established for each tranche increasing by approximately 15%. In each such primary offering, IPXI would retain 20% of the proceeds, with 80% going to the relevant Sponsor.

After the initial sale of a ULR by IPXI, members could trade ULRs at market clearing prices on IPXI’s proprietary trading platform. In these secondary market transactions, IPXI would retain a commission and remit the remaining proceeds to the Sponsor.

B. Distinguishing features of the IPXI Exchange

The proposed IPXI ULR model purported to offer several advantages over existing structures for conducting transactions in patent licenses. First, obtaining a ULR on the IPXI market involved substantially less time and effort than negotiating bilateral patent licenses from individual patent holders. Second, by fixing the initial offering price of each ULR, IPXI eliminated price negotiation from these transactions. Third, the standardized nature of ULR rights eliminated negotiation over other license terms and conditions and assured that all licenses were granted on identical and non-discriminatory terms.

Of course, many of these advantages also exist in patent pools, which similarly aggregate patent rights from multiple firms and offer package licenses on standardized pricing and other terms. Like the administrators of patent pools, IPXI conducted an evaluation of the patents contributed by its Sponsors and assessed their essentiality to the relevant industry standards. The IPXI model differed from patent pools, however, in two key respects. First, whereas IPXI’s ULRs may be freely traded by the purchaser on the IPXI exchange, the license rights granted by a patent pool are rarely, if ever, transferrable. Second, pricing for ULRs, after their initial offering, is driven by open market transactions. Thus, if competition by alternative technologies made a particular technology less valuable in the marketplace, the holder of a ULR may sell it at a discount from the original purchase price. Conversely, if a technology increased in value, the price of

2 IPXI was a wholly-owned subsidiary of Chicago-based IPXI Holdings LLC (Holdings). The members of Holdings included Royal Philips Electronics, CBOE Holdings, Ocean Tomo LLC and other investors. Unlike Holding, IPXI used the term “member” to designate a participant on its exchange and not an entity having any ownership interest in IPXI.

Fig. 1. The IPXI Trading Platform

6 Source: IPXI presentation (Nov. 12, 2014)
ULRs could rise on the open market. Pricing of patent pool licenses, however, is generally static.\footnote{Another feature differentiating IPXI ULRs from patent pool licenses, though not necessarily an advantage of ULRs, is the pre-paid nature of ULR licenses. That is, a ULR represents a defined number of prepaid sublicense rights, and is purchased prior to the manufacture of the relevant devices. Under most patent pool licenses, payment is not required until after a device is manufactured or sold. In this regard, the purchase of a ULR involves a risk that the buyer will not use the associated sublicense rights and may also be unable to resell the ULR to recoup its investment (see Part V.I.E below).}

C. Antitrust Review

Given the novel structure of the IPXI market, and the increased scrutiny with which antitrust enforcement agencies both in the U.S. and Europe have viewed patent licensing transactions, in 2012 IPXI sought a business review letter (BRL) from the U.S. Department of Justice (DOJ) prior to launching its first offering [16]. In early 2013 the DOJ issued its response, which was inconclusive at best [17].\footnote{The letter states that “Due to the inherent and potential competitive concerns associated with IPXI’s novel business model ... the Department declines to state its present enforcement intentions regarding IPXI’s proposal at this time. We simply do not know enough to conclude that IPXI’s activities, once operational, will not raise competitive concerns.”}

First, the DOJ acknowledged that “IPXI’s proposed exchange potentially could generate efficiencies for the IP marketplace and encourage innovation through increased licensing efficiency, sublicense transferability, and greater transparency”. Against these pro-competitive benefits, the DOJ assessed the potential risks associated with the proposed exchange. In particular, it questioned the decision of IPXI to prohibit Sponsor patent holders from independently licensing their patents in a ULR’s field of use. The DOJ pointed out that such independent licensing, which is permitted by many patent pools, reduces the risk that the pool will dominate a particular technology market. The DOJ also questioned IPXI’s unwillingness to exclude patents that could function as substitutes for one another from a ULR offering, as the inclusion of substitutes in a pooled offering can reduce incentives to innovate. Nevertheless, the DOJ concluded that, at least with respect to patents deemed to be essential to the implementation of a particular standard, it was likely that ULRs would include only complementary patents and would exclude substitute patents. For these and other reasons, the DOJ withheld judgment regarding its future enforcement intentions regarding the IPXI exchange.

Perhaps because of the noncommittal response by the DOJ, in October 2014, immediately prior to the launch of its 802.11n ULR, IPXI commissioned a White Paper by David Kappos, Carl Shapiro and Christine Varney, three well-known and highly-regarded former governmental officials\footnote{Kappos, a partner at Cravath, Swaine & Moore LLP and Special Legal Advisor to the Board of Managers of IPXI Holdings, LLC, served as Under Secretary of Commerce and Director of the U.S. Patent and Trademark Office from 2009-13. Shapiro, Transamerica Professor of Business Strategy at the Haas School of Business, University of California Berkeley, served as Deputy Assistant Attorney General for Economics at the Antitrust Division of the U.S. Department of Justice from 2009-11 and 1995-96. Varney, a partner at Cravath, Swaine & Moore LLP, served as Assistant Attorney General for the Antitrust Division of the U.S. Department of Justice from 2009-11 and as a Commissioner of the U.S. Federal Trade Commission from 1994-97.} [19]. The

III. IEEE’s 802.11n Standard

A. Evolution of the Standard

The IEEE 802.11 series of wireless local area networking standards, commonly known as Wi-Fi®, have become ubiquitous around the world. The first version of the standard, 802.11a, was released in 1999. Development of IEEE 802.11n began in 2002. The standard was first released in 2007 and published in final form in 2009. It employs multiple antennae to achieve maximum data transmission rates of approximately 450 Mbps, a significant improvement over the 54 Mbps rates achieved under the previous 802.11g standard (2003) [11]. While 802.11n was leapfrogged in 2012 by 802.11ac, IPXI estimated in 2014 that approximately 8 billion wireless chipsets implementing 802.11n would be produced between 2009 and 2019 [1].
B. 802.11 and Patents

The 802.11 series of standards was developed over the course of two decades by employees of hundreds of different firms and institutions collaborating under the aegis of the IEEE Standards Association. Estimates put the total number of patents covering the 802.11 standards at approximately 3,000 [14], held by 93 different patent holders [13]. Unlike some standards for consumer electronics media (e.g., CD, DVD), only a small fraction of the total number of patents essential to IEEE 802.11 are included in patent pools.⁶

IEEE, like many SSOs, requires that participants commit to license patent claims essential to the implementation of IEEE standards on terms that are FRAND [12]. Though IEEE’s intellectual property policies are comparatively detailed, and IEEE recently approved a set of amendments to its policy clarifying some aspects of the scope and nature of the commitments required of patent holders, the precise requirements of its FRAND commitment is not specified.

C. 802.11 FRAND Litigation

The uncertainty surrounding SSO FRAND commitments has led to substantial litigation over the past several years. IEEE’s 802.11 standards have been the subject of several such disputes, probably due to a combination of their popularity, their longevity, and the large number of patents covering aspects of these standards. IEEE 802.11 standards were the subject of dispute in recent cases including Microsoft v. Motorola, Apple v. Motorola, In re. Innovatio and Ericsson v. D-Link, to name just a few.

One of the principal points of contention in these cases was whether a patent holder complied with its obligation to charge a royalty that was “reasonable”. To answer this question, the courts have been required to determine precisely what the reasonable royalty rate would have been for asserted patents covering the standard. A sample of the rates determined in these cases is set forth in Table 1 below.

<table>
<thead>
<tr>
<th>Case</th>
<th>Court</th>
<th>No. 802.11 Patents</th>
<th>Per-Device FRAND Royalty</th>
<th>Royalty per patent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft v. Motorola</td>
<td>W.D. Wash.</td>
<td>11</td>
<td>$0.03471</td>
<td>$0.003</td>
</tr>
<tr>
<td>In re. Innovatio</td>
<td>N.D. Ill.</td>
<td>19</td>
<td>$0.0956</td>
<td>$0.005</td>
</tr>
<tr>
<td>Ericsson v. D-Link</td>
<td>E.D. Tex.</td>
<td>3</td>
<td>$0.15</td>
<td>$0.05</td>
</tr>
</tbody>
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⁶ For example, Via Licensing offers licenses under a pool of 35 802.11-essential patents owned by five patent holders (primarily older versions of the standard) and Sisvel Patent Pool offers licenses under a number of 802.11-essential patents owned by three patent holders.

⁷ Motorola asserted 24 patents, only 11 of which were found to be infringed by Microsoft’s products [13].

As Table 1 illustrates, the range of reasonable royalty rates for patents covering the 802.11 standard varies considerably, from a low of $0.003 per patent in Microsoft to a high of $0.05 per patent in Ericsson. This variation may be attributed to differences in the value of the patents at issue, the validity and infringement of those patents, and other factors. Nevertheless, the fact that court-determined FRAND royalty rates diverge by an order of magnitude for patents covering the same standard has added a significant element of uncertainty to FRAND royalty determinations.

IV. IPXI’s 802.11n FRAND ULR Offering

In order to address the inefficiencies and uncertainties surrounding the licensing of patents covering IEEE 802.11n, in October 2014 IPXI launched an offering of 50,000 ULRs aggregating 194 patents essential to the 802.11n standard.

A. Structure of the 802.11n Offering

Each of IPXI’s 802.11n ULRs represented a sublicense to manufacture and sell 1,000 wireless chipsets conforming to the IEEE 802.11n standard. The bundled rights in each ULR included 194 patents owned by eight different entities: Columbia University, the University of California, Fraunhofer-Gesellschaft, JVC Kenwood, Philips, Mitsubishi Electric, Orange, and Sony. These patents were issued in 19 different countries including the United States (63), Germany (20), France (20), Great Britain (19), Japan (17) and Sweden (10). Of the 194 patents, 142 were deemed essential to mandotory portions of the 802.11n standard, and 52 were deemed essential to optional portions.⁸

As noted above, IPXI planned to set the price of each ULR offering based on bids received from market participants. To assist with bidding, IPXI estimated a fair price for each 802.11n ULR of $120 ($0.12 per device or $0.0006 per patent). Compared to the per-patent rates calculated from the judicial decisions illustrated in Table 1, the IPXI estimated rate is comparatively low.

B. Quintessentially FRAND?

One of IPXI’s principal intentions regarding the 802.11n offering was to help participating patent holders comply with their obligation to grant licenses on FRAND terms. It claimed that setting ULR offering prices based on bidder expressions of interest would, by definition, result in a royalty rate that met the legal standard of reasonableness. That is, not only was IPXI’s estimated offering price of $0.12 per device based on an assessment of judicial and private royalty determinations for versions of the same standard, but any bids made by potential licensees would reflect rates that those parties viewed as acceptable and, therefore, reasonable. Thus, IPXI claimed that its model would yield prices that were “quintessentially” fair and reasonable [16].

Despite drawing on input from both buyers and sellers, it is not clear that IPXI’s methodology would, in fact, yield a

⁸ IPXI required each Sponsor to commission an independent essentiality expert to evaluate the essentiality of its contributed patents to the 802.11n standard [4].
FRAND royalty rate, at least as FRAND has been defined by several courts and commentators. Lemley and Shapiro, for example, argue that a FRAND royalty should take into account the value of a patented technology before it is incorporated into a standard and manufacturers have sunk significant costs into the standardized technology (becoming “locked-in”) [6]. In other words, the royalty should not be higher simply because a patented technology was incorporated into a standard [15]. But instead of seeking to determine this ex ante value, the IPXI model would have established prices ex post, after the standard had become locked-in and manufacturers had little ability to migrate to a different technology. As such, the IPXI price may have been what licensees were willing to pay, but this decision would have been influenced by their sunk investments and would not necessarily reflect the ex ante reasonable value of the technology.9

C. Demise of IPXI

It is no exaggeration to say that IPXI’s 802.11n ULR offering was a failure. Insufficient investor interest was generated even to price the offering. Given the lack of participating bidders, on March 23, 2015 IPXI announced that it would discontinue operations effective immediately [20].

V. METHODOLOGY

There is a limited amount of public information available regarding IPXI and its operations. As of this writing, the IPXI web site (www.ipxi.com) contains little content aside from press releases and links to news stories, and the IPXI trading platform is no longer accessible. The author was provided with copies of IPXI’s offering documentation for the 802.11n ULR, as well as other background materials, by IPXI prior to its shut-down. The author also interviewed representatives of three large U.S.-based firms active in 802.11 product markets that were aware of IPXI and its ULR approach, but which declined to participate in IPXI’s offerings. Due to the premature discontinuation of the 802.11n ULR offering, it is not known which firms, if any, bid on, or expressed interest in, these ULRs.

VI. UNDERSTANDING THE FAILURE OF IPXI

This section draws on the sources described above to assess the likely reasons that the 802.11n offering, and IPXI more broadly, failed to achieve success in the market.

A. The Missing Threat of Litigation?

IPXI executives have attributed the exchange’s failure to potential patent licensees’ unwillingness to obtain required licenses unless threatened with litigation. Though IPXI and its Sponsors retained the ability to enforce the patents that were licensed under the ULRs, IPXI had no history of patent enforcement or litigation, nor any announced plan to commence litigation.10 Thus, in its shut-down announcement, IPXI explained that “potential licensees made it clear that the only way IPXI would really get their attention was through litigation, and that’s exactly what our business model tried to overcome” [20]. Or, as IPXI’s CEO stated in a press interview, “there was no incentive [for potential licensees] to talk without the threat of litigation” [18].

This line of reasoning places the blame for IPXI’s failure on the manufacturers of Wi-Fi enabled products. It essentially accuses these manufacturers of preferring to free ride on the technical innovations of patent holders than pay royalties. The argument is reminiscent of the music industry’s explanation for the collapse of the market for recorded music circa 1999: absent the threat of legal action, consumers would rather steal than buy.

There is, of course, some truth to the notion that patents are valuable only if they are backed-up by the threat of enforcement. Property rights in general, whether representing land, chattels or intellectual creations, have economic value only to the extent that the law provides their owners with the means for excluding others from exploiting those rights without permission. Firms in a competitive marketplace should be expected not to act out of altruism, but out of commercial necessity. If a patent holder has evidenced no interest in enforcing its patents, then infringers would be acting rationally by adopting a “wait and see” approach until presented with a credible threat of enforcement [21]. This approach holds especially true in the context of SEPs, as to which questions of essentiality, validity and infringement remain open until resolved through adjudication.

This being said, it is not the case that all, or even most, patent licenses are negotiated and executed only after litigation has been threatened or commenced. Firms enter into consensual licensing agreements on a regular basis without any overt threat of litigation. This observation holds true both for SEPs and non-SEPs, and for individual patents, patent portfolios and patent pools. Transactions in all of these licenses are conducted regularly by willing market participants prior to litigation. Thus, it is likely that the absence of a litigation threat was not the only cause of IPXI’s failure.

B. Characteristics of the Offering – Patents and Sponsors

If a new restaurant opens but attracts few customers, the first things that one usually questions are the quality and price of its food. Given that manufacturers of Wi-Fi enabled products did not flock to purchase IPXI’s 802.11n ULRs, it is worth considering whether any features of the ULRs themselves made them unattractive to the market.

As noted above, the 802.11n ULR included licenses under 194 patents, 142 of which were deemed by IPXI to be essential to mandatory portions of the standard. While this is not an insignificant number, it is relatively small in comparison to the thousands of patents estimated to be essential to IEEE’s 802.11

9 It is worth noting that the White Paper commissioned by IPXI, of which Shapiro was a co-author, did not claim that IPXI’s methodology would yield FRAND royalty rates, but only the more modest claim that its greater transparency would “promote FRAND licensing” [19].

10 One interviewee reported that, in its final weeks, IPXI engaged the services of an outside law firm to send notices of infringement and FRAND non-compliance to various 802-11-compliant product manufacturers.
standards. Thus, IPXI’s ULR could not serve as a one-stop solution for a manufacturer of 802.11-compliant products, nor alleviate the majority of the burden of negotiating bilateral license agreements pertaining to the standard. Rather the ULR had the potential to eliminate individual negotiations with only the eight Sponsors of the included 802.11n SEPs. As such IPXI offered a complex system that was, at best, a partial solution to perceived problems with the SEP licensing market.

More importantly, it is not clear that those eight Sponsors were key players in the 802.11 licensing market. Indeed, of the eight ULR Sponsors, none had an active history of enforcing or licensing patents in the 802.11 marketplace. A recent industry study by Armstrong, Mueller and Syrett identifies patent holders with announced 802.11 licensing programs [22]. These include Lucent, Agere, Motorola, Innovatio, Ericsson and two existing patent pools (Sisvel and Via). None of the IPXI ULR Sponsors appear on this list. Accordingly, the IPXI Sponsors may not have been viewed as threats by the majority of manufacturers.

Thus, had IPXI’s 802.11n ULR included more patents, or more significant patent holders, its perceived value to manufacturers may have been greater.

C. Legacy Relationships Concerning 802.11

Another factor potentially impacting the attractiveness of the 802.11n ULR was the long history of prior 802.11 standards and licensees. As noted above, 802.11n was not a new standard, but a successor to prior versions 802.11a, -b and -g that dated back to 1999. While 802.11n clearly introduced new technological features such as multiple antennae, its basic architecture built upon a foundation that had already been laid. As such, major device manufacturers had years to solidify patent licensing relationships with the principal contributors to the standard. By the time that IPXI’s 802.11n ULR was offered in 2014, it may have been the case that many industry players were already parties to licensing relationships concerning the standard.

D. Limitations of Standardized ULRs – Cross-Licensing and Non-SEPs

Like all commodity contracts, IPXI’s ULRs were defined by a set of uniform, standardized terms. Such uniformity is necessary to enable market trading and pricing. While patent licenses are often granted on bespoke terms that are negotiated bilaterally between licensor and licensee, standardized terms are not unknown in the field of patent licensing. For example, the licenses granted by most patent pools are largely standardized and uniform across transactions.

Nevertheless, standardized terms limit firms’ flexibility to enter into transactions that meet their specific needs. In the case of the 802.11 ULR, this constraint may have impacted the desirability of the ULR in two ways. First, when a standardized license right is granted at a uniform price, the licensee is unable to offset part of the license price by licensing its own SEPs to the patent holder. The practice of cross-licensing is key to many technology markets and often results in royalty-free exchanges of patent licenses by market participants [23]. Cross-licensing enables the licensee to use its own patents as a currency in obtaining a desired license from the patent holder. Such bargaining is not possible within the constraints imposed by a tradeable ULR offered at a uniform price. Accordingly, potential licensees who might have wished to offset part of their license cost using their own patents may have found the IPIX ULR to be less attractive than a bilaterally-negotiated license.

Second, a standardized ULR contains licenses under a fixed package of SEPs, but without complementary non-SEPs owned by the Sponsor. Some commentators have argued that licenses of SEPs alone are not widely desired in the market, as major patent holders control both SEPs and non-SEPs that are desirable for products complying with a standard [24]. While some patent pools have successful licensing programs covering only patents that are essential to a standard (e.g., the CD and DVD patent pools), participants in some markets may desire licenses under both SEPs and non-SEPs held by major patent holders, an option that was not available through the proposed ULR.

E. The Cost of Prepayment

Most patent licenses bear royalties on an earned pay-as-you-go basis. That is, royalties are calculated as a percentage of the licensee’s net revenue earned from sales of covered products. As such, royalties are not due unless and until covered products are sold. Thus, the profits of both the patent holder and the licensee are tied to the licensee’s sales.

The license rights accompanying a ULR, on the other hand, are purchased up-front. One 802.11n ULR costing $120 permits the purchaser to manufacture and sell 1,000 802.11n-compliant devices. As with pork bellies, if the purchaser finds that it does not need all of the license rights that it has purchased, it can resell any undepleted ULRs on the open market and thereby recoup its costs. By the same token, if it finds that it has not purchased enough license rights, it can purchase additional ULRs on the open market. These dynamics enable commodities markets across a broad range of goods to operate efficiently.

However, it is not clear that manufacturers believed that the IPIX exchange would offer sufficient trading volume to afford them this degree of liquidity. Thus, unlike pork bellies, which can reliably be purchased on the “spot” market at predictable prices when the need arises, additional 802.11n ULRs might or might not have been available to satisfy a manufacturer’s requirements. Likewise, if a manufacturer over-purchased ULRs and the market for 802.11n devices dropped sharply, it
may have questioned its ability to resell unused ULRs on the open market to recoup its costs.

Thus, the pre-paid nature of ULR contracts imposed a financial risk on licensees that did not exist with traditional pay-as-you-go patent licenses. If licensees over-purchased, they might not be able to recoup the cost of their over-investment, and if they under-purchased, they might not be able to access additional ULRs at expected prices.

F. Artificial Scarcity and the Fallacy of Market-Based FRAND Pricing

One of IPXI’s principal claims was that its open market pricing mechanism would, by definition, establish the FRAND royalty rate for the patents covered by its ULR. That is, if the price for these licenses were established by willing bidders in an open market, then it must be reasonable. However, this reasoning ignores another principal feature of the IPXI exchange model: scarcity. Unlike physical commodities such as wheat, crude oil and gold that are traded on traditional commodities exchanges, patent licenses are non-depletable. That is, there is no natural limit on the number of licenses that may be granted under a particular patent. One patent, in theory, may be licensed to an infinite number of licensees without depleting the strength of the original resource. Unlike wheat, the overall supply of which may fluctuate from year to year generating price variation based on demand, an owner of patents may always create more license rights at no additional cost.

In order to create a market in tradable ULRs, IPXI was required to limit the number of ULRs available to the market. Only in this way could a viable secondary market be sustained for ULRs (i.e., one in which sellers of ULRs were not competing with an endless stream of new ULRs offered by IPXI or its Sponsors). IPXI’s initial tranche consisted of 50,000 ULRs, which would authorize the manufacture and sale of up to 50 million 802.11n chipsets, far lower than its lifetime projection of 8 billion chipsets. It is not difficult to envision a scenario in which the initial supply of ULRs was too low to meet market demand for worldwide production of standards-compliant devices. Of course, IPXI could then issue additional ULRs, as it contemplated doing in subsequent tranches. But if it did not, then the price of existing ULRs on the secondary market would rise in response to demand.

One result of such dynamics might be the emergence of speculation and arbitrage in the market for ULRs. One could easily imagine non-practicing ULR “trolls” that quickly bought up offerings of important ULRs solely to resell them to manufacturers at elevated prices. Of course, the existence of speculators in commodities markets is hardly a new phenomenon, as evidence by the recent run-up in the price of Bitcoins. The more important question, however, is whether the existence of such a secondary market would benefit either innovation or consumers of standardized products. It is far from clear that any such benefits would emerge.

Furthermore, the manufactured scarcity of ULRs suggests that their pricing would not necessarily reflect a ‘reasonable’ royalty rate, notwithstanding IPXI’s intentions. One need only consider for a moment the impact of supply on pricing to realize that much of the pricing of IPXI’s offering should depend not on the value of the patents constituting its ULR, but on the number of ULRs that IPXI decided to issue. That is, IPXI estimated a “reasonable” price of $120 for one ULR ($0.12 per device) in its offering of 50,000 802.11.n ULRs. But what if IPXI had planned instead to issue 100,000, or 100 million, ULRs? It is hard to imagine that supply would play no role in the pricing of the commodity, and one could estimate that the per-device price of a ULR in an offering of 100 million should be substantially lower than in an offering of 50,000. And if this is the case, which price represents the FRAND rate? Would patent holders be deemed to have complied with their FRAND obligations, as IPXI seems to suggest, by offering a limited number of licenses at an elevated price? The answer is less than clear, and several market participants expressed both confusion and skepticism regarding IPXI’s pricing model.

VII. CONCLUSIONS

IPXI identified real inefficiencies in the current system for licensing standards-essential patents. It developed a market-based exchange for the trading of ULRs in an attempt to address these inefficiencies and to provide greater uniformity, speed and transparency to patent licensing transactions. Nevertheless, IPXI failed to establish a market for its offering of 802.11n ULRs, leading to its rapid demise.

IPXI’s assertion that the failure of its ULR offering can be attributed to a lack of threatened patent litigation against the manufacturers standards-compliant products tells only part of the story. Other weaknesses in both the content of the 802.11n ULR and the structure of the ULR offering itself also contributed to IPXI’s failure to gain market acceptance. IPXI’s proposed ULR exchange left many questions unanswered, making manufacturers cautious about embracing its new model. And unlike traditional commodities exchanges, which arose from practices implemented by buyers and sellers of goods, the IPXI exchange did not emerge from a grassroots effort by patent holders or manufacturers to improve the basis on which they transacted business. Rather, IPXI was a financially-motivated undertaking that had the potential to introduce significant uncertainties and the potential to disrupt and complicate an already-contentious market for patent licenses. As such, it is not surprising that there was not widespread support for the exchange from patent holders or manufacturers of standards-compliant products. Nevertheless, the lessons learned from the IPXI experiment should be useful in future efforts to improve the efficiency and transparency of patent licensing transactions and the rationalization of FRAND commitments.

REFERENCES


