Strategic Analysis of Patent Portfolios and Litigation Risks

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I. Abstract

This paper proposes a patent portfolio risk analysis and decision tool for technology managers. The goal is to evaluate the relative risk of portfolio licensing as opposed to litigation while providing a simplified presentation for management.

This analysis technique combines numerical analysis of patents in the portfolio with a heatmap overlay on the product architecture. This technique is then applied to a widely licensed telecommunications patent portfolio.

II. Introduction

The evaluation of patent portfolio's has become increasingly important in the fields of mobile communications, internet services, and smartphone technologies. It is not uncommon for a patent portfolio, that is owned by a Patent Assertion Entity (PAE) to make a demand on a growth stage company for a licensing fee.

Patent portfolio licensing involves this decision for management:

- Bearing the risk and cost of litigating; or
- Entering into a settlement agreement that grants a license for all of the patents in the portfolio that may or may not be being asserted.

The licensor often sells this opportunity via a "carrot and stick approach". The *carrot* is a "bulk discount" on licensing, and the *stick* is the risk of future litigation against the client involving individual patents in the portfolio. The question for management with this licensing question is whether this proposed portfolio license is a

good business decision. In short, is this "price of peace" for licensing a patent portfolio a "fair one".

The methodology is then applied to the licensing of a patent portfolio that is being asserted a large telecommunications company.

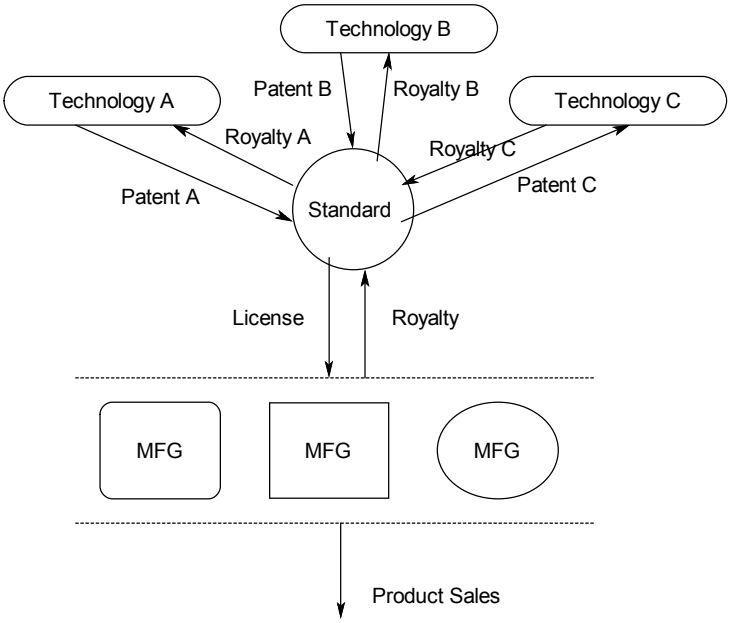
III. Overview of Patent Pools

A. Patent Pools and Portfolios

The commercial use of patent pools portfolios has grown hand-in-hand with the rise of the competitive manufacturing industry in the United States. One of the first patent portfolios that was created involved the cross licensing of patents related to sewing machines. [1, pg. 440 citing to the 1856 patent pool created by Wheeler & Wilson, Grover & Baker, and I.M Singer]. These patent pools were followed by those in other industries, such as agricultural machinery. [Id.]. These agreements created patent pools in exchange for royalties and effective control over key aspects of a core technology. For example, in the case of a sewing machine, patents would exist on the bobbin structure, the needle and thread structure, etc. Any one company that manufactured a sewing machines in the 1850's would likely infringe on the patents of competitive manufacturers, but this patent pool allowed three manufacturers to improve their collective competitive positions vis-à-vis other sewing machine competitors by use of this pooling arrangement. [Id.]

Patent pools are also using for technology that is in wide use today. The USB (Universal Serial Bus) is a good example of a core technology that has resulted in a widely licensed patent pool. [2.] Likewise the MPEG patent pools cover key technologies regarding key distribution of video technologies to manufacturers. [3.] Both the USB and

MPEG patent pools are licensed on a terms that are considered "fair and reasonable". The wide deployment of these standards is a consequence of the balance between the relatively small royalty revenue and the wider adoption of the technology. Diagrammatically, the relationship of the patent pool and the consumers of the product illustrates that the patent pool provides protection to end-users of the product via the licenses.

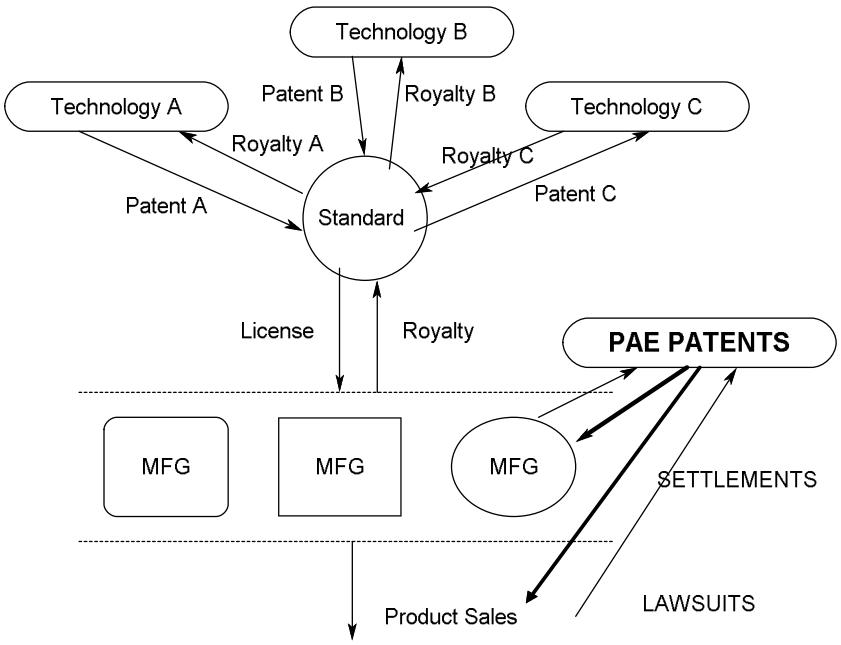


In this licensing scenario, patent holders are forced to negotiate with members of the patent pool for the reasonable royalty. The dispute is not over increased royalties from the manufacturers, rather the division of royalties to the members of the pool. How these disputes are to be resolved and how royalties are to be allocated was described in the 204 page opinion authored by Judge Robart on April 25, 2013. [4.]

B. Patent Assertion Entities

The growth of widely used standards, such as HTTP (e.g. internet protocols), HTML, and other technologies, has created a dilemma for manufacturers. The Patent Assertion Entities (PAE) typically acquires non-core patents that implicate these widely used internet standards. [see 5, for PAE statistics]. As noted in the PAE statistics, smaller companies (<$10M in annual revenue and internet startups) bear the brunt of these patent infringement lawsuits.

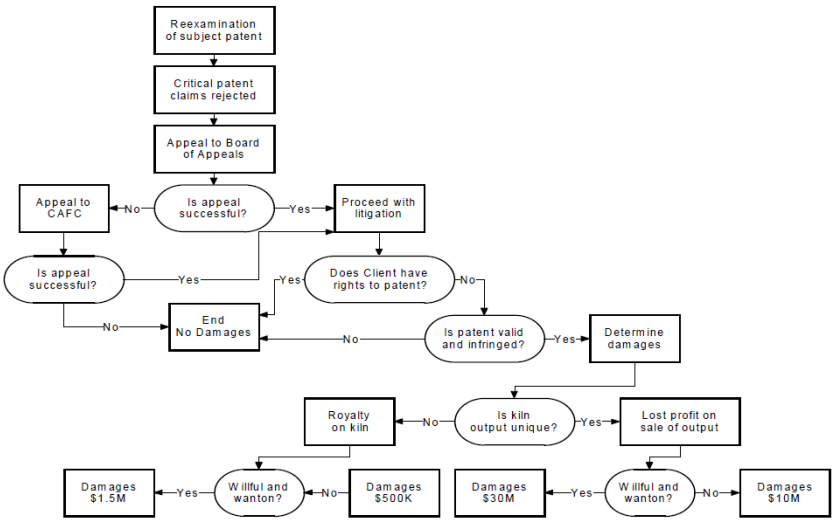
PAE's typically choose patents that "ride on" existing standards but are not part of a patent pool. as the patent holders do not manufacture products. Diagrammatically this can be shown:



The "opportunity" for the PAE is "free ride" on the growth of the market due to the standards provided by the manufacturers. This problem is especially vexing for engineering and product managers that must assess the risk for infringement claims during the growth phase of a company.

C. Patent Litigation Risk Metrics

The consequence of not licensing the patent portfolio from the PAE is the potential impact of litigation. For example, a leading patent assertion entity lays out the risk allocation model in the form of a decision tree. [6]. This decision tree is fairly standard for the assertion of a single patent as against an alleged infringer.



But what is the decision process when the alleged infringer is faced with a patent portfolio?

IV. Patent Portfolio Models and Litigation Risk

A patent portfolio ***PP*** may be represented as a group of related patents that are owned by a single entity or a cooperating group of entities where one or more of the patent claims would cover a particular aspect of a product.

The value of a patent portfolio (PPV) is the patent discounted value (PVD) of each of the individual patent values (PV). PV is determined by the following equations:

PPV = SUM (PV[n]) * PVD[n])

Where = PVD[n] = f(P,C, R,T))*I(F).

P = *Asserted Patent*
C = *Patent Claims Asserted*
R = *Reasonable Royalty Rate*
V = *Validity*
T = *Lifetime of Patent*
I = *Feature Set, (F) of the target product.*

The litigation risk cost (LRC) is cost of providing a defense to the patent portfolio and the resultant risk of damages. The decision point of whether to litigate or license the patent portfolio is:

If *LRC* > *PPV* then license the Portfolio

If *LRC*<*PPV* then litigate the Portfolio.

The downside risk of a patent portfolio license is the imposition of future license fees for patents that have only marginal applicability to the feature set of the product that is being supplied by the infringer. In short, the patent portfolio seeks to extend the life of the core patents.

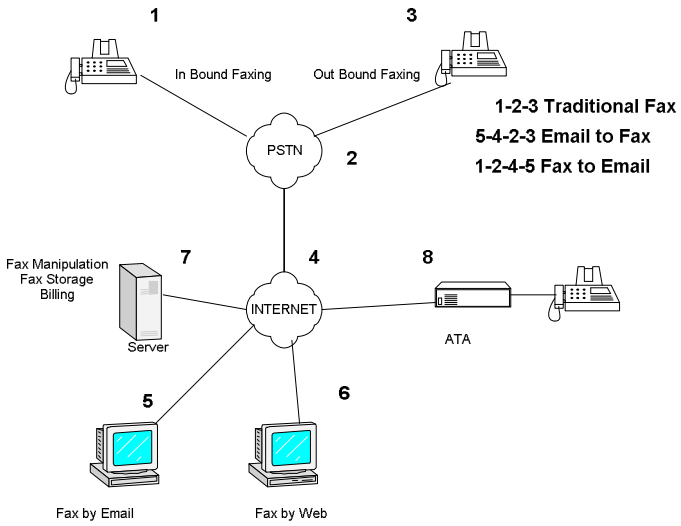
V. Application to Telecommunications Litigation

The term "fax" or "facsimile" has been identified with a device that will draw in a sheet of paper, digitize the contents of the paper. To create a "network effect" the manufacturers standardized on a communications protocol, known as "G3". Fax is a relatively old, standardized, technology that has since been adopted and modified first to support personal computers with "fax cards", then via the internet. The transmission of a fax is usually referred to as "in bound faxing" (the machine receives a fax) or "out bound faxing" (the machine transmits a fax).

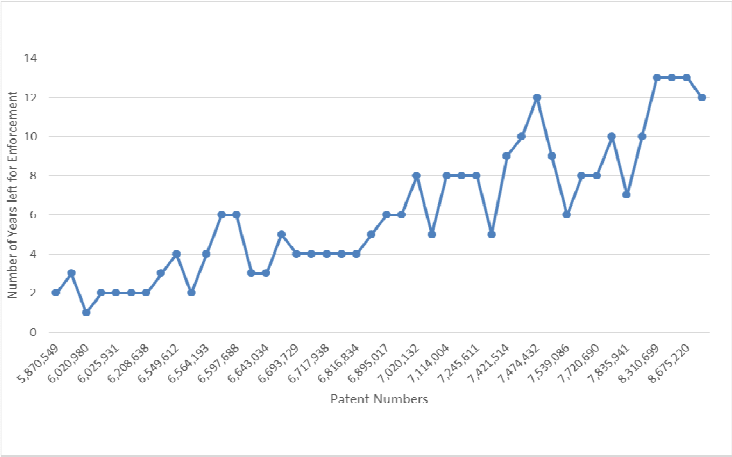
In the late 1990's and early 2000's, j2 Global, (NASDAQ jcom), has become the dominant (>60% market share) provider of virtual faxing technology. j2 has approached the market through a process of litigation and acquisition. Competing virtual faxing companies were sued and acquired at a discount.

As their market share has grown, competitors have been faced with the option of taking a "patent portfolio license" that is approximately $ 1/mo per telephone line for the entire patent pool. For a company to evaluate whether this is a good value one must look at the patents being asserted and the virtual faxing supply chain.

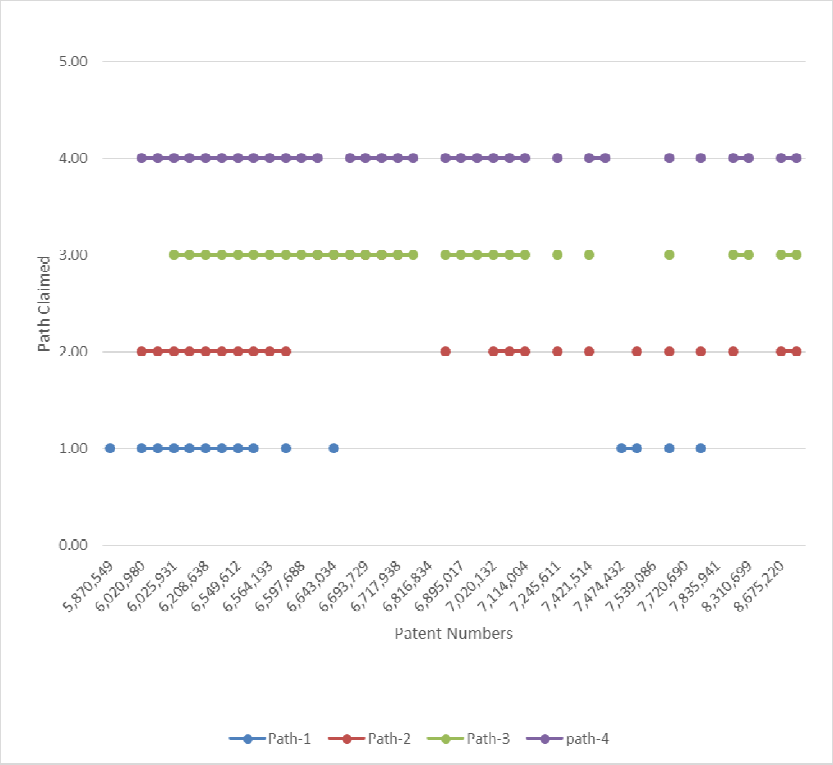
The virtual faxing architecture is best represented by the following system diagram:



j2 Global's patent portfolio consists of 60+ patents that are in varying stages of life. Graphically represented these key patents have the following remaining time for enforcement.

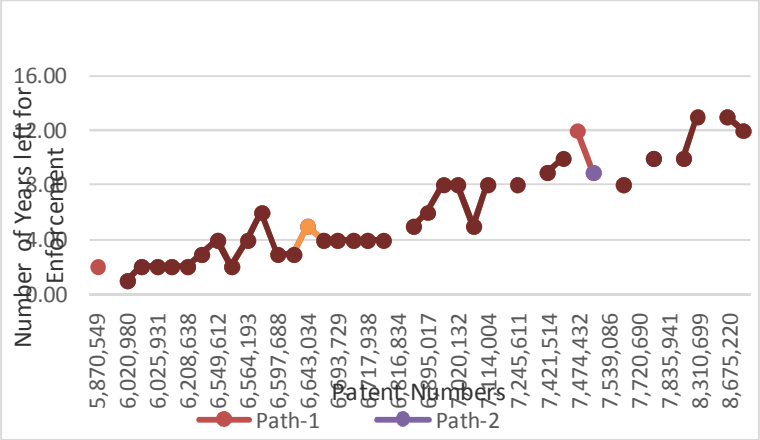


But each patent does not cover all aspects of the "fax delivery" supply chain. These patents cover different aspects as shown below:



Path-1: 1-2-3 (Traditional Faxing) - Path-2: 1-4-5 (Fax by E-mail) -Path-3: 1-4-6 (Fax by Web) - Path-4: 1-4-7(Fax Accounting)

This analysis demonstrates that certain aspects of the fax delivery system (in bound faxing, out bound faxing) do not have the same amount of risk. Cross referencing the life of the patent indicates to the delivery chain indicates that systems that involve accounting features predominate patents with the longest life.



Another way to analyze this patent data is to look at data and indicate those patents that pose the greatest risk of infringement in the format of a “heatmap”. (See below). This heatmap demonstrates that the patents to analyze are those that involve technologies for the Path 2, Path 3, and Path 4.

More detailed maps can be built by subdividing the technology for each path into specific elements. For example, communication may be accomplished by many different types of underlying communication protocols (e.g. HTTP vs. HTTPS). This type of mapping can provide the product manager with areas to avoid implementation.

This technique may also be automated by text searching particular keywords and building automated maps.

U.S.Pat No.	Path-1	Path-2	Path-3	path-4
5,870,549	2.00			
5,877,963				
6,020,980	1.00	1.00		1.00
6,023,345	2.00	2.00		2.00
6,025,931	2.00	2.00	2.00	2.00
6,073,165	2.00	2.00	2.00	2.00
6,208,638	2.00	2.00	2.00	2.00
6,350,066	3.00	3.00	3.00	3.00
6,549,612	4.00	4.00	4.00	4.00
6,563,914	2.00	2.00	2.00	2.00
6,564,193		4.00	4.00	4.00
6,564,321	6.00	6.00	6.00	6.00
6,597,688			3.00	3.00
6,625,642		3.00	3.00	3.00
6,643,034	5.00	5.00	5.00	
6,564,193		4.00	4.00	4.00
6,693,729		4.00	4.00	4.00
6,707,580		4.00	4.00	4.00
6,717,938		4.00	4.00	4.00
6,721,398			4.00	4.00
6,816,834				
6,857,007		5.00	5.00	5.00
6,895,017			6.00	6.00
6,999,478			8.00	8.00
7,020,132		8.00	8.00	8.00
7,024,457		5.00	5.00	5.00
7,114,004		8.00	8.00	8.00
7,184,160				
7,245,611		8.00	8.00	8.00
7,296,026				
7,421,514		9.00	9.00	9.00
7,448,539				10.00
7,474,432	12.00			
7,480,065	9.00	9.00		
7,539,086				
7,539,291	8.00	8.00	8.00	8.00
7,720,690				
7,808,936	10.00	10.00		10.00
7,835,941				
7,990,950		10.00	10.00	10.00
8,310,699			13.00	13.00
8,326,930				
8,675,220		13.00	13.00	13.00
8,804,924		12.00	12.00	12.00

VI. Conclusion

This paper provides a methodology for analyzing a proposed patent pool to determine if licensing a proposed patent pool would exceed the expectation cost of litigating. The methodology consists of two stages: (1) numerical analysis of the portfolio; and (2) presentation of this analysis in the form of a heatmap representations.

The value of this methodology is that the underlying portfolio is analytically quantified so that the product manager can better understand the risks of implementation.

VII. References

[1] *Mattoil, Michael;* Power and Governance in Patent Pools; Havard Journal of Law & Technology, Volume 27, No. 2, Spring 2014.

[2] _____; See http://www.epo.org/learning-events/european-inventor/finalists /2013/bhatt/feature.html downloaded on 03.01.2015.

[3] _____; See http://www.mpegla.com/main/pages/media.aspx downloaded on 03.19.2015.

[4] *Microsoft Corporation vs. Motorola Mobility,* CASE NO. C10-1823JLR WD WA, April 25, 2013.

[5]

[2] Lerner. Josh & Tirole, Jean; Public Policy toward Patent Pools, April 2008 University of Chicago Press, Innovation Policy and the Economy, Volume 8.

[3] _____, Patent Pools and AntiTrust – Comparative Analysis, World Intellectual Property Organization, March 2014.

[4] Mariana, Myriam and Roman "Stacking" or "Picking" patents? The inventors' choice between quality and quantity;