Subject: PharmaCo Patent Portfolio Assessment	
To:	Venture Capital Fund
From:	IPVision, Inc.
Project:	PharmaCo Intellectual Property Analysis
Date:	December 24, 20xx

This is an actual report produced by IPVision for a Venture Capital Fund. To preserve confidentiality the text has been "sanitized" and the links to the actual patent maps have been removed. Deletions and changes are marked with <** or **** or similar markings.

IPVision, Inc., a Boston-based Intellectual Property portfolio qualitative analysis provider has been requested by Venture Capital Fund to provide a third-party assessment of the PharmaCo patent portfolio. IPVision was founded by current and former faculty members of the Massachusetts Institute of Technology to provide intellectual property analyses for business decision making, including corporate venture investment considerations.

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1. EXECUTIVE SUMMARY

PharmaCo is building out a global portfolio, which currently consists of 21 issued patents in the United States (13), Europe (3), Japan (2), Hong Kong (2) and Canada (1). This report analysed only the U.S. part of the portfolio.

PharmaCo's portfolio contains 4 distinct areas:

- *XYZ* For Use In Neuromuscular Therapy. These are low molecular weight peptides ***** that are useful as a neuromuscular blocker and ******. This part of the portfolio consists of 8 issued U.S. patents<**link to list on Advantage™ removed**>, one Canadian and one European patent.
- *ABC* Compositions For Cancer Treatment. These cover C-terminal peptides that ***** as well as pharmaceutical compositions that include the peptides. Also described are methods of inhibiting ****; methods for inducing ****. and claims to **** for the treatment of cancer. This part of the portfolio consists of 4 issued U.S. patents<**link to list on Advantage™ removed**>, one Japanese and one Hong Kong patent.
- Compounds And Methods For The Detection of *DEF*. These are directed to ***** binding compounds, methods for detecting *DEF*), methods of identifying **** in a sample from a subject (by detecting *DEF*), and methods of identifying a ***** in a subject (using a *DEF* binding peptide or an antibody *******). This part of the portfolio consists of one issued U.S. patent<**link to list on Advantage™ removed**>, one European, one Japanese and one Hong Kong patent.
- *DEF* For The Treatment Of Skin Conditions. No patents have been issued from applications filed in this area of the portfolio.

For reasons discussed in the report, we have evaluated the entire U.S. portfolio as a single portfolio.

* * * * * *

IPVision Level 1 Portfolio Ratings have been shown to be highly correlated with investment and commercial success for companies in venture capital portfolios. The PharmaCo U.S. patent portfolio has a Level 1 score of 3.2 out of a possible 5, or a bit above average.

The patents in the U.S. portfolio have a high degree of cross-citation with each other, which is usually a good indicator of a coherent patenting strategy. The patent claims are Broad and the Structure of the claims is about average, meaning that they are reasonably strong.

However, even though the U.S. patents have been issued for a number of years there is only ONE patent that cites any of them. This is highly unusual in a commercial portfolio but is often seen in an academic portfolio for a new technology that has not yet been commercialized. So the question for Venture Capital Fund is whether there is a technology/product/market fit and whether the existing team has sufficient commercialization experience and capability. These are observations from a strictly intellectual property viewpoint – it is for others to assess the market and actual technology etc.

Individual analysis results are summarized below. More detail descriptions of the analysis methodology and results are contained in the body of the report.

Portfolio Size. PharmaCo's U.S. portfolio is of a reasonable size given the age of the company.

Portfolio Building. To measure the degree of Portfolio Building IPVision determines the extent to which there is cross-citation in the portfolio. There is much higher than average cross-citation in the PharmaCo U.S. patent portfolio.

Seminal Patents. Research has shown that the value of a patent is directly related to the number of times a patent is cited by other patents.[1] Identifying these "seminal" patents is an important step in evaluating a portfolio of patents. In a portfolio such as this with an average age of about 6 years we consider a Seminal Patent to be any patent which is cited by more than 15 patents. There is only ONE patent that cites any of the issued U.S. Patents of PharmaCo or their related published application.

IP Landscape. The PharmaCo patents only cite 5 non-PharmaCo patents as prior art and only one other patent cites PharmaCo. This means that the Direct Citation Landscape around the PharmaCo patents is NOT crowded. However, given the age of this portfolio the fact that there are so few patents in the immediate landscape is VERY UNUSUAL.

Portfolio Age. The age of a company's patent portfolio is an important factor in making an investment in the company. The longer the remaining life of the portfolio the better because once a patent has expired others are free to use the invention. The Average Remaining Life of the U.S. patents in the PharmaCo portfolio is 11.82 years – roughly half of their entire life.

Patent Claims Quality. The U.S. patents in the PharmaCo portfolio are Broad. Their Structure rating is Average.

Extended Patent Landscape. As mentioned above, there is only one patent citing any of the PharmaCo portfolio patents. To provide a broader context we investigated the Extended Patent Landscape, in this case the Backward Cousin Patents that cite the same patents that PharmaCo patents cite. There are over 460 patents in the extended landscape. The companies owning the greatest number of these patents are:

Current Owner	# U.S. Patents
Medtronic Ardian Luxembourg S.a.r.l.	76
Amylin Pharmaceuticals	52
Warsaw Orthopedic	39
MannKind	35
Novo Nordisk A/S	19
Ardian	18
Gear Box	18
Sanofi	17
Sanofi-Aventis Deutschland	16

These patents of these organizations should be reviewed by the technology and business experts to characterize what areas are being addressed by these companies and how they may or may not relate to PharmaCo.

[1] See, Jaffe, Adam B. and Trajtenberg, Manuel, Patents, Citations & Innovations: a Window on the Knowledge Economy (Cambridge, The MIT Press, 2002)

1.1. Access to Advantage™ and Debrief Session

For this project IPVision will establish up to 5 logins on the Advantage™ system for Venture Capital Fund and its authorized representatives. Please contact us with the email addresses and names of those who should be given accounts. We will also provide an Advantage™ training and debrief session to discuss the results of this analysis and answer questions.

2. What is the Value of a Patent and a Portfolio?

A key factor in making investment decisions in a technology based company is assessing the value of the company's intellectual property and the relative importance of that IP in protecting the short and long term revenue streams and profitability of the company. This requires consideration of individual patents and the overall portfolio.

The "Value" of a Single Patent is dependent on 3 main factors[2]:

- The Importance of the Invention.
  - Is this a Cure for Cancer or a "Jumping Snail" toy?
    - The number of Citations a patent has received is a measure of "importance"
- The Protection of the Invention.
  - Has the Value of the Invention Been "Captured"?
    - The Quality of the Patent Claims and the Protection Strategy.
- The Commercialization Strategy.
  - What is the Plan to Extract the Value that has been Created and Captured?

An example of a valuable patent that ranked high on these 3 factors is the Cohen-Boyer patent on recombinant-DNA (rDNA) technology that launched the biotech revolution. Stanford made over $250 million in royalties on this and 2 related patents.

The "Value" of a Patent Portfolio is dependent on the value of the individual patents and the way in which they are put together to achieve a business goal. The individual patents are the bricks/building materials and the Portfolio is the building or wall that is put together with these individual patent bricks. If the bricks are weak then the wall will be weak. If the bricks are strong but the plan is poor you may end up with a pile of bricks.

The analyses presented in this report provide perspectives on these components of value.

3. PharmaCo Patent Properties

3.1. Patent Property Listing

PharmaCo has a patent portfolio currently consisting of 21 issued patents in four patent families:

[2] See "How to Tell What Patents Are Worth" by Joe Hadzima, Forbes Leadership Forum

Patent Property Type	Total Properties	... NEUROMUSCULAR THERAPY	FOR CANCER TREATMENT	CANCERS AND DRUG DELIVERY	OF SKIN CONDITIONS
U.S. Provisional Expired	5	1	1	2	1
U.S. Application Abandoned	5	3		1	1
U.S. Application Pending	1				1
US Issued	13	8	4	1	
PCT Expired	4	1	1	1	1
European National Phase	1				1
European Issued	3	1	1	1	
Canada Application	3		1	1	1
Canada Issued	1	1			
Japan Issued	2		1	1	
Hong Kong Issued	2		1	1	
Mexico-Abandoned	1			1	
Brazil Application	1			1	
		15	10	11	6

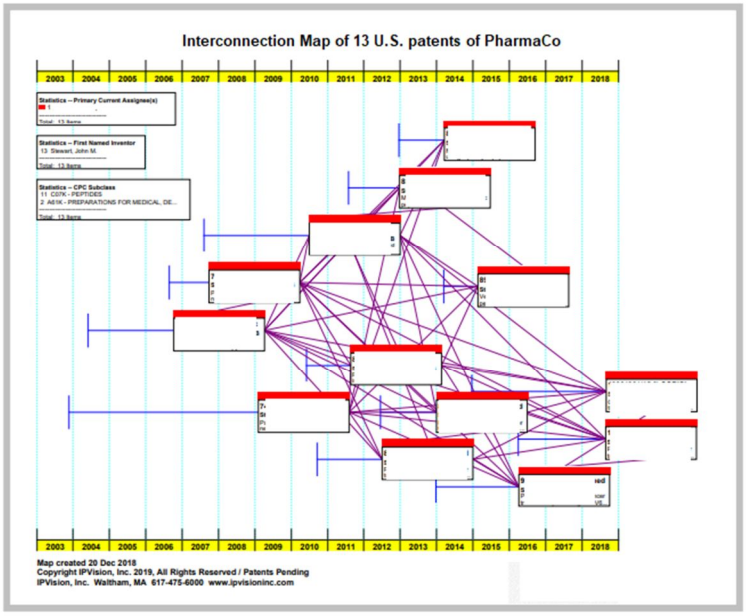
A listing of the PharmaCo patent properties as furnished by PharmaCo is attached as Appendix C.[3]

The U.S. issued patents have been loaded on the IPVision Advantage™ Patent Analytics system and can be accessed by Venture Capital Fund and its advisors. Click Here to See List<**link to list on Advantage™ removed**>.

3.2. U.S. Portfolio Interconnection Map

The following is an IPVision Patent Interconnection Map as of December 20, 20xx showing the 13 issued U.S. patents of PharmaCo and the citation relationships among them:

Patent Interconnection Map of PharmaCo U.S. Patent Properties



Commentary

The cross citation of the PharmaCo patents is indicative of patent portfolio building and is generally a positive factor. *<note: the text on the patent boxes have been covered up to preserve confidentiality>*

Click on the Map Image to view an interactive map on Advantage™. *<note: the map link has been removed to preserve confidentiality>*

See, APPENDIX A - How to Read an IPVision Patent Map

[3] As of November 20xx. NOTE: one of the entries is incorrectly numbered – see Appendix B

3.3. U.S. Patent Portfolio Age

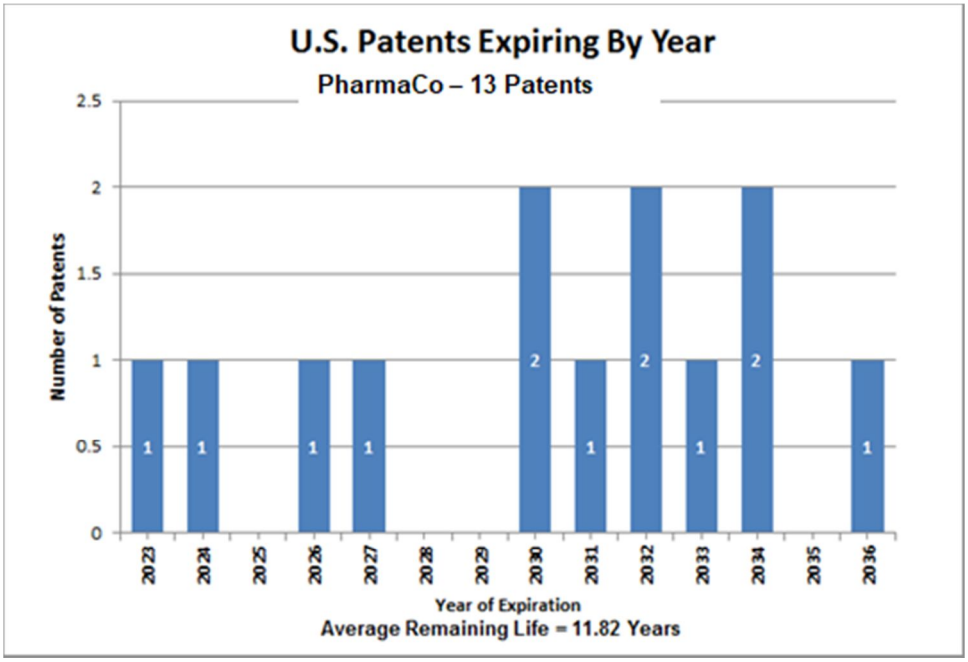
The age of a company's patent portfolio is an important factor in making an investment in the company. The longer the remaining life of the portfolio the better because once a patent has expired others are free to use the invention.

In the United States, under current patent law, the term of patents, provided that maintenance fees are timely paid, is:

- For utility applications filed on or after June 8, 1995, the patent term is 20 years from the filing date of the earliest U.S. application to which priority is claimed (excluding provisional applications).
- For utility applications that were pending on and for patents that were still in force on June 8, 1995, the patent term is either 17 years from the issue date or 20 years from the filing date of the earliest U.S. or international (PCT) application to which priority is claimed (excluding provisional applications), the longer term applying.
- Design patents filed on or after May 13, 2015 have a term of 15 years from issuance. Design patents filed prior to May 13, 2015 have a term of 14 years from issuance.

There are circumstances in which the term of a patent can be extended, e.g., for delays caused by the U.S. Patent and Trademark Office during prosecution. The determination of the actual termination date of an individual patent requires more in depth analysis than the scope of this report. Accordingly, we have simply charted out the remaining term of the portfolio's patents using the general rules described above.

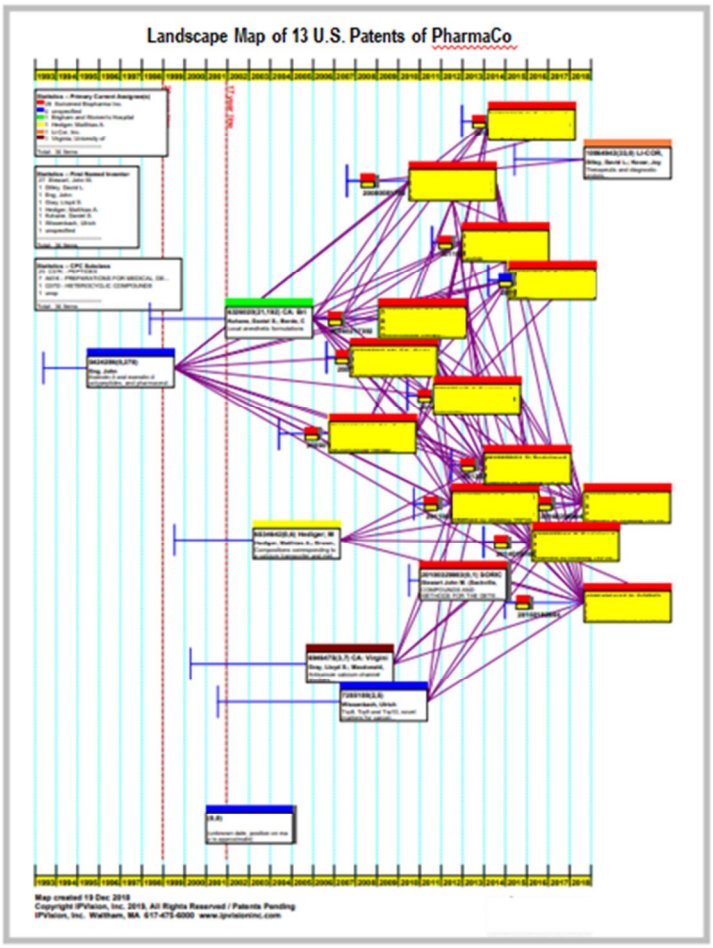
The Average Remaining Life of the U.S. patents in the PharmaCo portfolio is 11.82 years. This chart shows the number of U.S. patents expiring by year:



3.4. U.S. Portfolio Patent Landscape Map

The following is an IPVision Patent Landscape Map as of December 19, 20xx showing the 13 issued U.S. patents of PharmaCo (yellow shaded boxes) and patents citing them and cited by them:

Portfolio Landscape Map of PharmaCo U.S. Patent Properties



Commentary

The yellow shaded boxes are the 13 PharmaCo patents. The orange topped box in the upper right is the only patent that cites any of the PharmaCo patents. *<note: the text on the patent boxes have been covered up to preserve confidentiality>*

The other patents to the "left" of the yellow shaded patents are the patents that PharmaCo cited as prior art.

As mentioned above, the cross citation of the PharmaCo patents is indicative of patent portfolio building and is generally a positive factor. However, the lack of citations from non-PharmaCo patents is potentially troubling.

Click on the Map Image to view an interactive map on Advantage™. *<note: the map link has been removed to preserve confidentiality>*

See, APPENDIX A How to Read an IPVision Patent Map

3.5. PharmaCo Patent Claims Strength

The fundamental right a patent owner has is to prevent others from practicing the invention claimed. In a real estate analogy, the claims are the fence that defines the land that you own and the property you can prevent others from trespassing on.

So the question is "how strong are the claims"? There are two primary players in the patent world: (1) the lawyers who write the claims and negotiate with the patent office to get a patent – these are call "prosecuting attorneys", and (2) the lawyers or business people that have to defend, enforce or license the resulting patents. In almost all cases there is NO overlap in these two groups. The people in the latter group are the ones who have learned from experience what makes a strong patent.

IPVision deploys over 40 proprietary algorithms to analyze claims in U.S. patents or applications using the combination of two measurements which are based on rules provided by experienced third party patent litigators and licensing experts:

1. BROADNESS Rating of A, B, or C – identifies claims coverage from A (likely to be broad) to C (narrow specific embodiments).

2. STRUCTURE Rating of 1, 2, 3, 4, or 5 – which rates the quality of the claim

construction from 1 (no obvious structural problems) to 5 (potential major problem). The structure quality rankings are based on case law references from the Deller treatise on Patent Claims (a source for statutory requirements and limitation of claims by court interpretation).

Each independent claim of the U.S. patent is evaluated and ranked according the IPVision Claims Analysis methodology.

Broadness Ratings:	
A=	Broad Claim
B=	Neither Broad nor Narrow
C=	Narrow Claim

Claims Structure Ratings:	
1 =	No Structural Problems (weighted)
2 =	1 to 3 Structural Problems (weighted)
3 =	4 to 6 Structural Problems (weighted)
4 =	7 to 10 Structural Problems (weighted)
5 =	>10 Structural Problems (weighted)

3.5.1. PharmaCo Patent Claim Ratings

The 13 U.S. patents of PharmaCo contain 19 independent claims. All of these claims have broadness ratings of "A" = the broadest claim category. The structure ratings range from 2 to 4 and the bulk of them are "3" rated or "average":

Click on chart to view underlying data on Advantage™<**link to list on Advantage™ removed**>

OBSERVATIONS:

- The fact that the claims are "A" Rated in Broadness is not surprising because there are so few patents in the direct citation space.
- However, overly broad claims can be a problem in litigation because there may be undiscovered prior art that can be found if the field is investigated deeply.
- Structure Ratings: Given the few patent citations and the broadness of the claims one might expect to find fewer "structural" problems with the claims than are present in the PharmaCo patents. Structure problems tend to creep in when the patent writer is trying to "get around" prior art and in doing so uses limiting or indefinite terms which makes enforcement more difficult.

3.5.2. Benchmarking the PharmaCo Claims

How do the PharmaCo claims stack up against others in the same general area? To assess this we create a Benchmark. The way in which we think about this is as follows:

- When a technology is “new” there is more “land” to claim – hence claims tend to be broader.
- As a technology area becomes crowded, claims tend to narrow - i.e., less “land” to claim.
- As claims narrow the probability of structure issues increases as the drafter tries to avoid prior art.

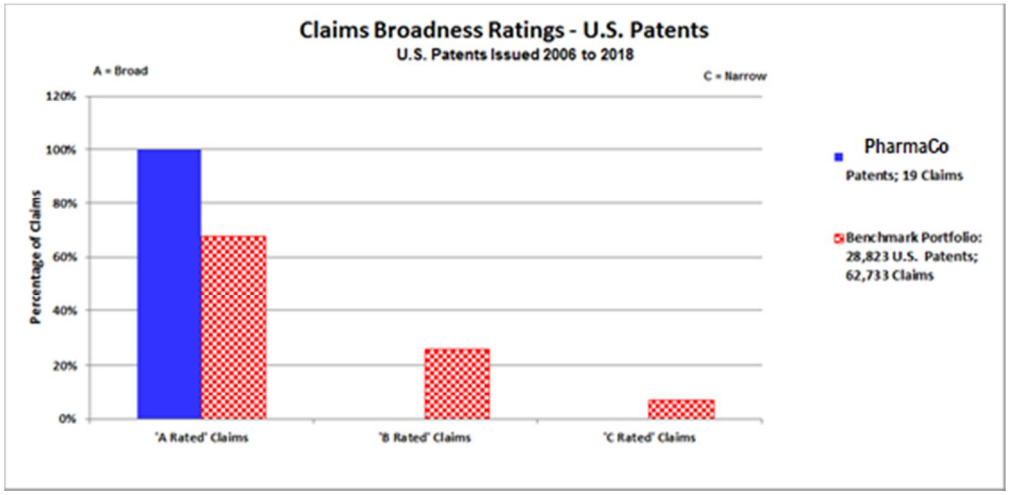
To get a fuller picture of claims strength we created a “Benchmark” portfolio of “Peer Patents”. A Peer Patent is a patent that:

- is in the same technology classification group (CPC Subclass[4]) as the Portfolio patent and
- was issued in the same year as the Portfolio patent

In the case of the PharmaCo patents the Benchmark consists of 28,823 patents and their 62,733 independent claims.

Broadness Ratings

In the following chart the PharmaCo patent claims are in solid blue and the benchmark claims are in the red cross-hatched bars:

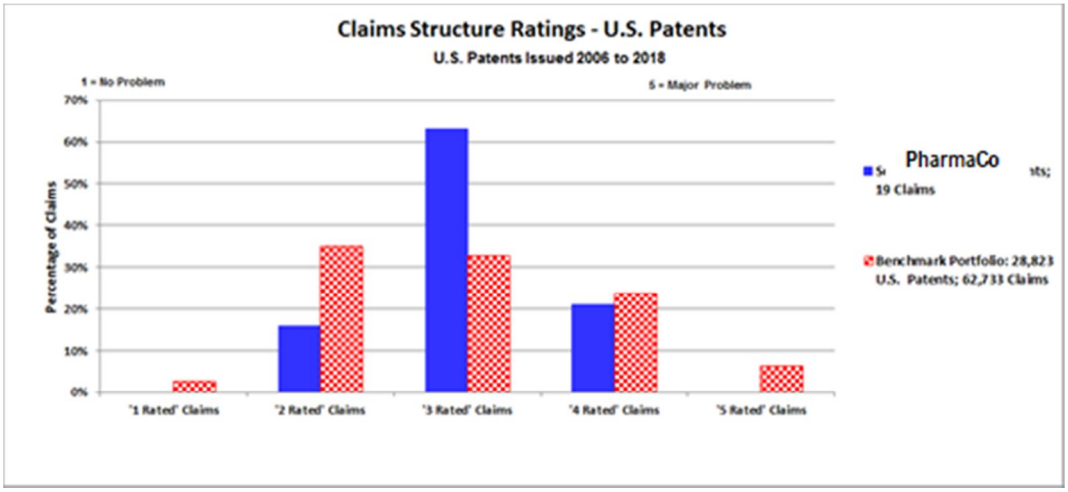


Note that 100% of the PharmaCo claims are “A” rated – the broadest – while only 67% of the Benchmark claims are “A” rated.

Structure Ratings

The PharmaCo claims have a lower percentage of structure “problems” (4 or 5 rated):

[4] See **APPENDIX D** For a Description of the CPC system



4. PORTFOLIO ASSESSMENT METHODOLOGY

IPVision has developed techniques to assess a company's patent portfolio from an investment/commercial success viewpoint.

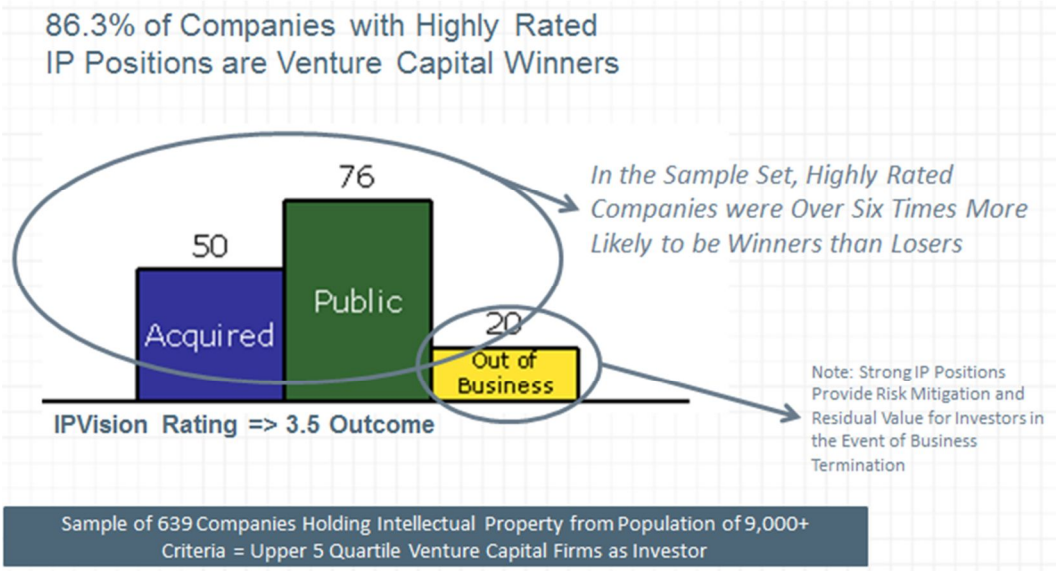
4.1. Intellectual Asset Management magazine study

The attached article "*IP in Early-Stage Commercial and Investment Success*" was published in Intellectual Asset Management magazine[5]. It discusses the results of IPVision's study of more than 9,000 venture capital backed companies' intellectual property positions based on publically available data about those companies' U.S. patents. These assessments demonstrate a marked correlation between "success" (with "Winners" measured by a company having achieved an IPO or having been acquired) and a company having developed (or possessed) intellectual property.

For the article we ran IPVision IP Analytics algorithms on the publicly available patent data for 639 companies in the portfolios of 5 top tier venture capital firms to determine for each company: (1) the amount and quality of its IP, (2) the company's position in the IP landscape and (3) how well it was managing its IP. Using these factors we assigned scores from 1 (Best) to 5 (Worst). We compared the scores of the Winners with those of the Losers (companies out of business):

- For companies with high IPVision ratings, 6 out of 7 (86%) were Winners.
- Winners had an average IPVision rating that was 21% higher than Losers.
- These results were consistent across all industry sectors where technology is a value driver.

[5] See **APPENDIX B** for the full IAM Article



4.2. Relevancy of IAM Study to PharmaCo Portfolio

The IAM Study was based on venture capital portfolio companies that were in the later stage of technology development. Our understanding is that PharmaCo has been working on its technology for a number of years, the earliest U.S. patent application date was in November of 2003 – fifteen years ago. Accordingly, the methodologies used in the IAM Study should be applicable to the PharmaCo portfolio.

5. ASSESSMENT OF PHARMACO PORTFOLIO

The IPVision Ratings used in the IAM Study address the following:

1. Does the Company have IP in the United States, both issued and pending?
2. Is the Company's IP Portfolio building strength?
   a. Is there any self-citation clustering present?
   b. Are there strong Patent Families?
3. Are there any obvious weaknesses?

The Rating System consists of 3 areas rated on a scale from 1 (weak) to 5 (strong):

PharmaCo Patent Portfolio Ratings		
Portfolio Strength:	**3.3**	Initial measure of the strength and defensibility of the portfolio
IP Landscape:	**2.6**	Initial measure of how well positioned is the IP relative to the technology area
Patent Family Size:	**3.7**	Initial measure of the investment of funds in a patent prosecution strategy
OVERALL RATING	**3.2**	3.2 out of a possible 5

The following sections summarize parts of the Assessment Ratings. See the accompanying "Level 1 – IP Profile Report" for more in depth discussion of each factor in the context of the PharmaCo U.S. Portfolio.

5.1. Portfolio Strength Factor

The IPVision Ratings System in the IAM Study considers 3 aspects of Portfolio Strength:

5.1.1. Amount of IP – Portfolio Size

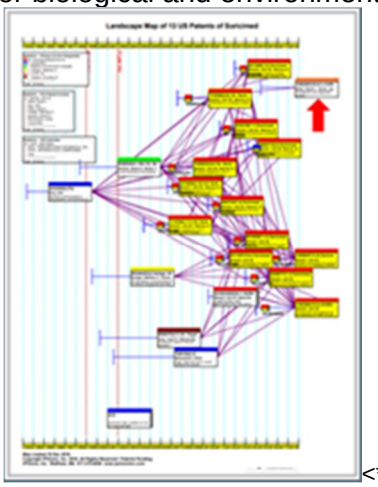
Portfolio Size. PharmaCo's U.S. portfolio is of a reasonable size given the age of the company. Factor Rating = 5 out of 5

5.1.2. Portfolio Building

Portfolio Building. To measure the degree of Portfolio Building IPVision determines the extent to which there is cross-citation in the portfolio. There is much higher than average cross-citation in the PharmaCo U.S. patent portfolio. Factor Rating = 5 out of 5

5.1.3. Seminal Patents

Seminal Patents. Research has shown that the value of a patent is directly related to the number of times that patent is cited by other patents. Identifying these "seminal" patents is an important step in evaluating a portfolio of patents. In a portfolio such as this with an average age of 6 years we consider a Seminal Patent to be any patent which is cited by more than 15 patents. There is only ONE patent that cites any of the issued U.S. Patents of PharmaCo or their related published application. US12345678 "*Therapeutic **** probes*" assigned to *CompanyA*. This patent cites 33 patents as prior art. *CompanyA* designs, manufactures, and markets instruments for biological and environmental research.



<**link to map on Advantage™ removed**>

Factor Rating = 0 out of 5

5.2. IP Landscape Factor

The second factor in the IPVision Portfolio Rating is the "IP Landscape". Here we are looking at how crowded the patent landscape is and where a company's patents are located relative to others.

IP Landscape. The PharmaCo patents only cite 5 non-PharmaCo patents as prior art and only one other patent cites PharmaCo. This means that the Direct Citation Landscape around the PharmaCo patents is NOT crowded. However, given the age of this portfolio the fact that there are so few patents in the immediate landscape is VERY UNUSUAL. Factor Rating = 2.6 out of 5.

5.3. Patent Family Size Factor

The "size" of a Patent Family provides valuable information about the resources invested in the technology by its owner. A Patent Family includes applications in process (continuations and divisions) as well as issued patents that are related in their patent prosecution histories. An issued patent that is part of a large Patent Family is likely to be more important than one that (a) is not part of a Patent Family or (b) is part of a smaller Patent Family.

In our IPVision Ratings for the IAM Study we used Patent Family size as a surrogate for an effective patent prosecution strategy.

Patent Family Size. As previously noted, the high cross-citation in the PharmaCo U.S. patent portfolio is a favorable factor. These patents are in several patent families that have been built out. Factor Rating = 3.7 out of 5

6. Extended Patent Landscape Analysis

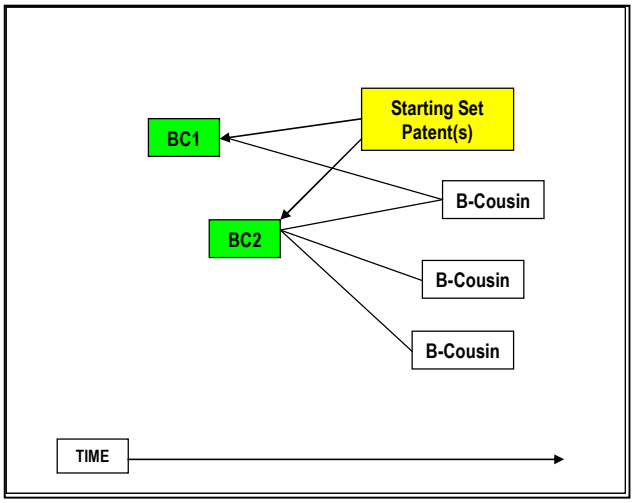
Because the immediate direct citation landscape of the PharmaCo portfolio is sparse (i.e., only one patent cites the portfolio and the portfolio only cites 5 other patents), we conducted an Extended Patent Landscape Analysis by looking at Backward Cousin Patents.

6.1. Backward Cousin Landscape of PharmaCo Portfolio

Backward Cousin patents are patents that cite the same patents that are cited by the Starting Set Patents (here the PharmaCo portfolio) – they are called "Backward Cousins" because to identify them we begin with the Starting Set Patent(s) and we go "backward in time" to find the patents that are cited by the Starting Set Patent(s) (BCs or Backward Citations) and then we go "forward in time" from the BCs to find other patents that also cite the BCs:

What Are Backward Cousin Patents?

BC1 and BC2 are "Backward Citation" Patents – they are cited by the Starting Set Patent(s)



These B-Cousins are the Backward Cousins of the Starting Set Patent(s) – they cite the same patents as the Starting Set Patent(s)

What a Backward Cousin Landscape does is identify potentially similar patents – i.e., patents that cite the same prior art patents that the PharmaCo portfolio cites.

The PharmaCo portfolio cites 5 patents not owned by PharmaCo:

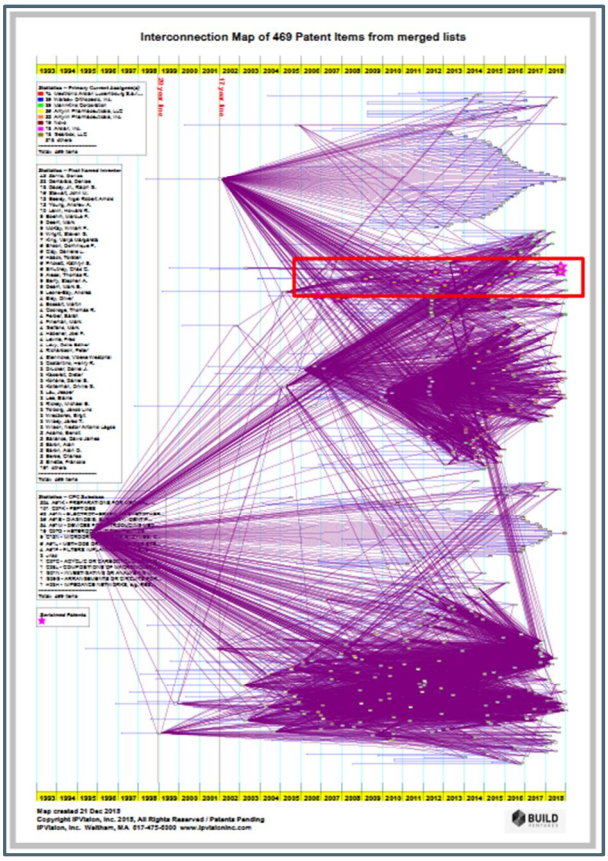
U.S. Patents Cited by PharmaCo U.S. Patents (Backward Citation Patents)

Patent Number	Title	Issue Date	# of Patents Citing This Patent	Current Assignee
5111111	abcdefgh, and pharmaceutical compositions comprising same	6/13/1995	278	Not Assigned
6311111	Local anesthetic formulations	12/4/2001	192	Medical Center Corporation
6511111	Compositions corresponding to a abcdefg and methods of making and using same	3/18/2003	6	Smith Martin A.
6911111	Anticancer xxxxx blockers	9/20/2005	7	Virginia, University of
7201111	ABC novel markers for cancer	4/17/2007	5	

Note the large number of citations for 2 of these patents. Click Here <**link to list on Advantage™ removed**> to view these patents.

There are 462 Backward Cousins <**link to list on Advantage™ removed**> that cite the Backward Citation Patents shown above. We combined the PharmaCo portfolio patents with the Backward Citation Patents and the Backward Cousin patents and created a Backward Cousin Interconnection Map:

Backward Cousin Interconnection Map of PharmaCo U.S. Patent Properties



Commentary

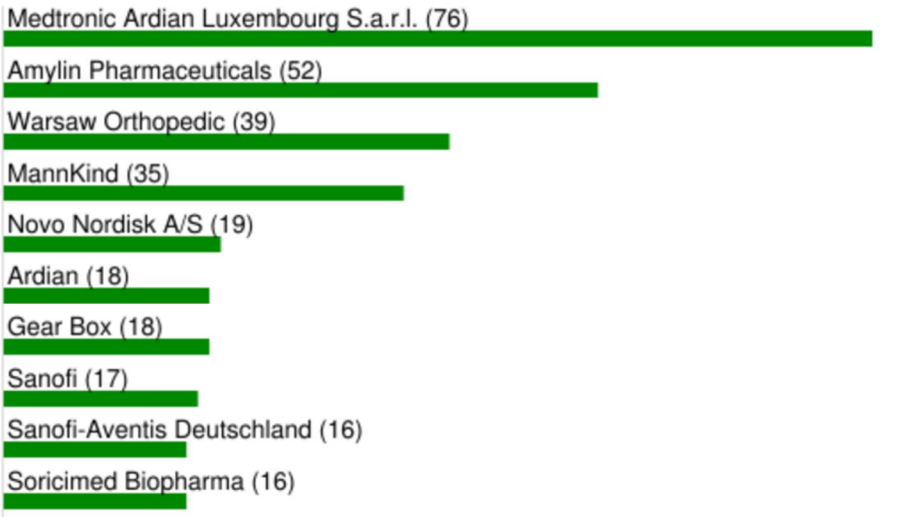
The PharmaCo patents are in the area of the map with the red box outline and are indicated on the live map with purple starts.

Click on the Map Image to view an interactive map on Advantage™. *<NOTE: the link has been removed in this sample report>*

See, **APPENDIX A** How to Read an IPVision Patent Map

Click Here <**link to list on Advantage™ removed**> for a listing of the Backward Cousin Patents. The Current Assignees shown on this map are:

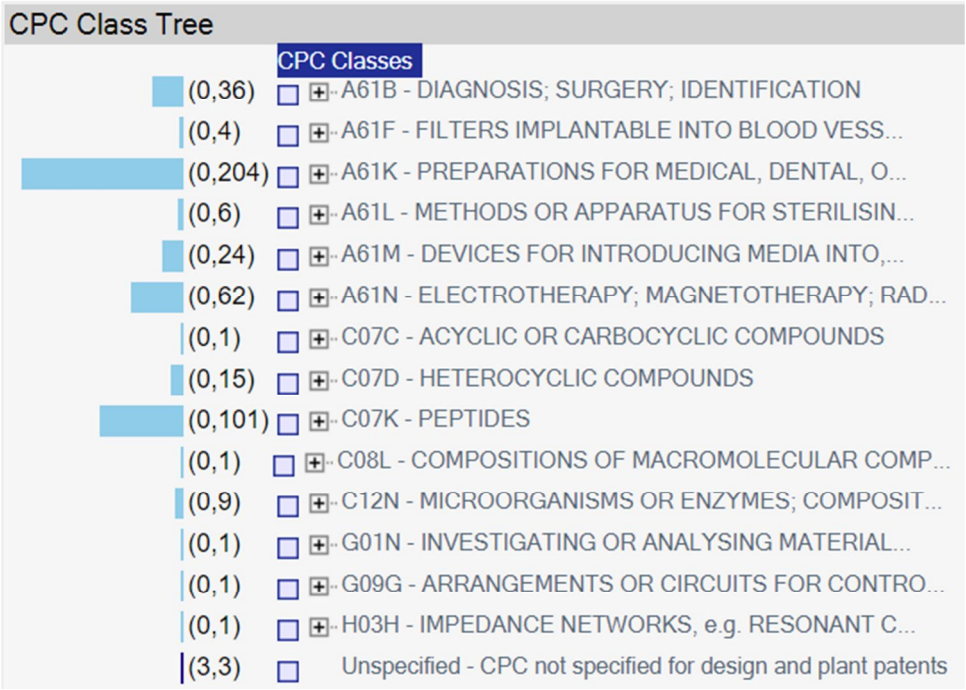
Top 10 Current Assignees Shown on Backward Cousin Interconnection Map



Click Here <**link to list on Advantage™ removed**>for a complete listing of Current Assignees

6.2. Technology Areas in Backward Cousin Landscape

The U.S. Patent and Trademark Office classifies patents into technology areas to aid in prior art searching and to assign patent applications to the examination group with appropriate technology experience. We can begin to characterize the landscape by looking at the Cooperative Patent Classification (CPC) classes that have been assigned to the patents in the landscape:



Click Here <**link to Advantage™ removed**> to view the CPC Class Tree Analysis

See **APPENDIX D** for a description of the CPC system.

7. STUDY CAVEATS

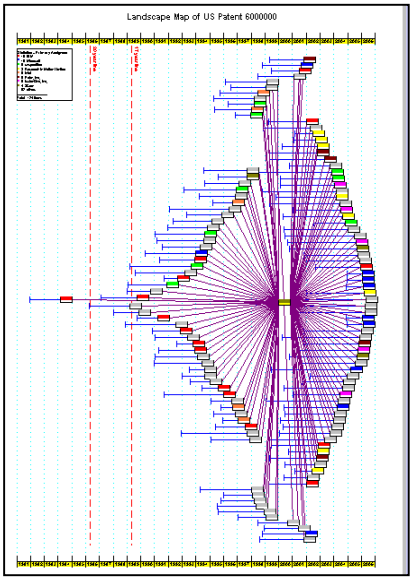
The analyses presented in this report are based on the data publicly available in the U.S. at the time and the information furnished by PharmaCo and are subject to the following caveats:

- Given the timeframe for this report and budget we have not conducted an extensive prior art search or review. We have relied on the prior art citations set forth in the U.S. Patent and Trademark database for the patents presented.
- Although we have reviewed the text and claims of certain third party patents mentioned in this report we have done so only in order to obtain a high level view of the landscape to help guide business decisions.
- Our conclusions and recommendations are based on our experience in working with companies similar to PharmaCo and only represent our current opinion of the matters set forth. Our recommendations are subject to change depending on how the area develops over time.

- IPVision does not give legal advice and nothing set forth in this report is intended to be and should not be considered legal advice. Without limiting the foregoing, this report should not be considered an opinion on "freedom to operate" matters.

Appendix A - How to Read an IPVision Map

An IPVision Map is a visual representation of the relationships between objects. The following is an example of a Landscape Map for a single U.S. Patent:

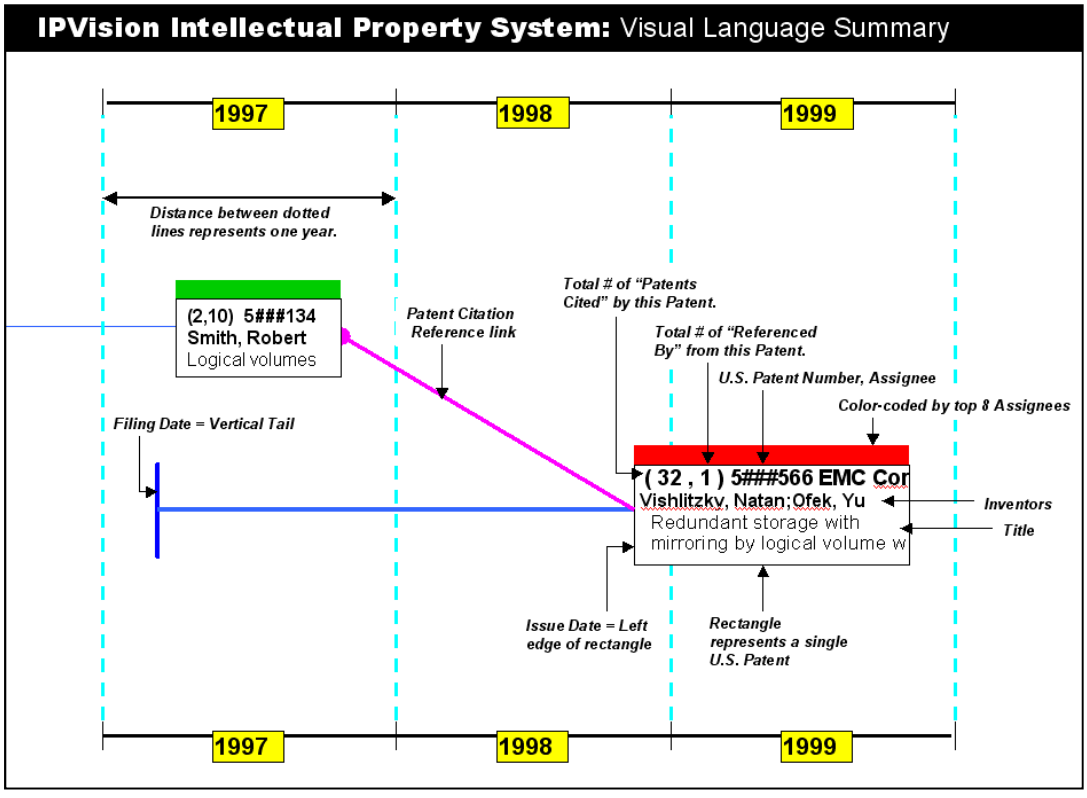


This Landscape Map is of U.S. Patent 6,000,000 entitled "Extendible method and apparatus for synchronizing multiple files on two different computer systems". It is the basic patent for the Palm Pilot software.

The horizontal X axis is "time"

Patent 6000000 is in the middle of the "fan". The lines going backward (to the left) are the patents cited by Patent 6000000 and the lines going forward (to the right) show the patents which cite Patent 6000000.

The details of an IPVision Map are explained in more detail below and at [IPVIsion Patent Maps]



APPENDIX B – INTELLECTUAL ASSET MANAGEMENT STUDY

The attached article "IP in Early-Stage Commercial and Investment Success" was published in Intellectual Asset Management magazine. It discusses the results of IPVision's study of more than 9,000 venture capital backed companies' intellectual property positions based on publically available data about those companies' U.S. patents. These assessments demonstrate a marked correlation between "success" (with "Winners" measured by a company having achieved an Initial Public Offering (IPO) or having been acquired) and a company having developed (or possessed) intellectual property.

Here are the highlights reported in the IAM Article:

- Sample: 5 Top Tier Venture Capital Funds.
- Because there was no publicly available data about the Internal Rate of Return (IRR) for all of the companies in these VC portfolios we selected 639 companies that had either had gone public or had been acquired ("Winners") and those companies that were no longer in business ("Losers")
- We ran IPVision IP Analytics algorithms on the publicly available patent data for these companies to determine for each company: (1) the amount and quality of its IP, (2) the company's position in the IP landscape and (3) how well it was managing its IP. Using these factors we assigned scores from 1 (Best) to 5 (Worst). We compared the scores of the Winners with those of the Losers:
    - **For companies with high IPVision ratings, 6 out of 7 (86%) were Winners[6].**
    - **Winners had an average IPVision rating that was 21% higher than Losers.**
    - **These results were consistent across all industry sectors where technology is a value driver**

[6] Investors should note that "Losers" with high IPVision ratings have potentially significant value in the residual IP.

IP in early-stage commercial and investment success

Detailed analysis shows that a high percentage of the most successful early-stage VC-backed businesses in the United States have a strong IP sense

By **Joseph Hadzima**, **Bruce Bockmann** and **Alexander Butler**

We are now one year and one US presidential election cycle after the financial contraction became evident to the investing public. Its impact upon early-stage companies, technology investments and the venture capital community has been dramatic.

As institutions and high-net-worth individual investors reduce their risk profiles and their allocation of funds to higher-risk/high-beta investments, the amount of funding available to venture capital firms is diminishing and the amount of venture capital available for early-stage investment is contracting rapidly.

The National Venture Capital Association reports that venture capital firms invested about US$3.7 billion in the second quarter of 2009 – roughly half of recent peaks of US$8 billion per quarter and closer to investment levels of the mid-1990s. As the amount of available venture capital diminishes, venture capital firms are less able to diversify their holdings to mitigate risk and, therefore, are required to upgrade the level and quality of fundamental analysis to accomplish the same levels of risk in a smaller portfolio.

The result is early-stage investors actively seeking new insights into what drives success and moving from traditional assessment processes to evidence-based decision-making. This includes, for early-stage, technology-intensive investments, increased focus on the quality of an early-stage company's intellectual property.

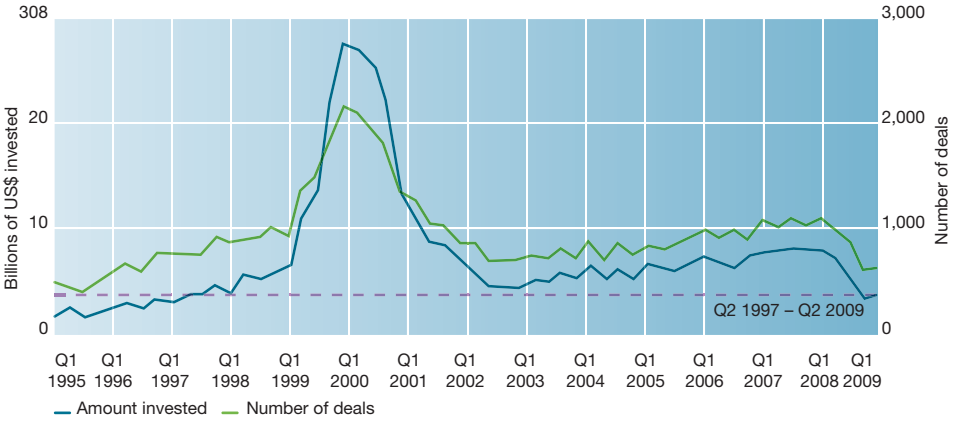
Over the past three years, seeking insights into the key drivers of success in early-stage companies, we worked with members of the investment community, corporate executives and MIT Sloan School of Management faculty to assess more than 9,000 venture capital-backed companies' intellectual property positions.

These assessments demonstrate a marked correlation between success (with winners measured by a company having achieved an IPO or having been acquired as a proxy for ROI) and a company having developed (or possessed) intellectual property. An even greater correlation exists between success and companies that have good or strong intellectual property positions. Given that analysis demonstrates that 86% of winners have strong (versus typical) intellectual property assessments, the importance of this investment dynamic should not be overlooked by providers or recipients of capital.

Can we forecast success based upon intellectual property?

From experience, many investors and their counsel collectively know that intellectual property is important. However, historically, most investors do not have consistent, clear and efficient methods for assessing intellectual property as part of investment decision processes. This business need is further clouded by the legal nature of patents. Increasingly, business executives and investors are calling for a new lens to consolidate the different perspectives of business, law and technology. If successful, benefits include reducing due diligence burdens, improved strategic conversations and increased transaction confidence.

Chart 1. **US VC investments 1995 to 2009**



Sources: PricewaterhouseCoopers/National Venture Capital Association MoneyTree.
Report data: Thomson Reuters. Copyright 2009. IPVision Inc

The key question is: can an evidence-based approach to intellectual property analysis provide insights into the business and competitive context of a company's intellectual property position as well as its importance and legal quality? Understanding these insights will improve one's ability to assess the business and investment value of a company's IP and its prospects for business and investment success.

Perspectives on value

For an early-stage, technology-intensive company, value and success boil down to a few core factors. First, is the technology good (ie, a cure for cancer or a better mouse-trap)? Second, is the legal protection for that technology sound? Third, are the commercialisation strategy and plan of execution good? And fourth, is the company's management talented and able? This research and assessments do not provide the ability to evaluate management directly; however, if the first three core factors are in place, it is probably safe to assume that management is talented and able.

Integrating business and intellectual property strategy in the early years of a company or industry has profound implications. Consider, for example, the remarkable growth of the biotech industry and Stanford University's related licensing income strategy following commercialisation of the Cohen-Boyer patent – the basic gene splicing patent. There were many strategies for commercialising the remarkable Cohen-Boyer patent. Stanford chose to make the licensing of its intellectual property relatively inexpensive. The result was the development by many parties of an entire industry and the generation of well over US$250 million of royalties for Stanford.

Guiding principles

Our first guiding principle was to create an evidence-based approach to screening and prioritising VC investment decisions. The second guiding principle was to provide timely, actionable insights and perspectives into intellectual property issues.

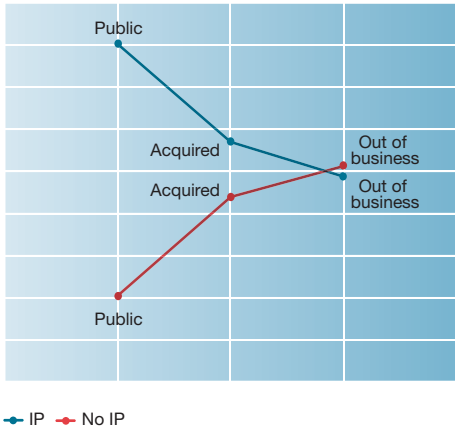
The analysis focused on developing statistically relevant metrics to sift investment opportunities, due diligence and decisions (and historical fund performance) from an intellectual property perspective.

Importantly, this research was not an attempt to identify a specific dollar value or to provide a legal opinion on any set of intellectual property rights. Rather, the objective was to develop a basis and systematic method for investors to triage opportunities and identify where traditional, more expensive deeper research and due diligence approaches would be warranted.

Approaching intellectual property from a business perspective, the assessments support answers to three important questions:

- Does the company have intellectual property and, if so, how strong is it? For companies and sectors where intellectual property is a key component of company value, one needs to measure the IP building blocks for the company.
- What is the intellectual property landscape position? Having numerous strong IP building blocks is one thing, but how those IP building blocks are

Chart 2. **IP holdings by exit outcome**



relatively positioned in the broader intellectual property landscape is another factor.

- Are the intellectual property rights being managed well? In other words, does the company appear to have a consistent, well-executed strategy for the intellectual property?

A central challenge was to develop simple and understandable guidance and initial answers to those questions even though the analytics behind the answers might be highly complex. The design resulted in a rating system using metrics derived from first principles and employing publicly available data and complementary analytics. The ratings are based on more than a dozen vectors and related calibration data that represent views of the three important questions: IP portfolio strength, IP landscape position and IP investment (family strategy).

The IP portfolio strength rating is composed of vectors that define and measure these factors:

- Absolute and relative amount of intellectual property – the number of issued US patents and published US patent applications owned of record by the target company, normalised by technology area and time factors based on objective comparative data.
- Degree of portfolio building. Through in-depth portfolio evaluations over the past decade and extensive academic research, it is clear that a portfolio in which patents cite other patents is indicative of strength as new patents build on existing intellectual property. Experience and extensive related calibration data, support measurements for absolute and relative portfolio building measurement.
- Intellectual property strength/quality. A company can have lots of patents and evidence of a building portfolio, yet not have strong, high-quality patents. To address this issue, patents can be assessed for their strength or seminal nature in a field and claims analyses.

The IP landscape rating is composed of vectors that define and measure the crowdedness of the intellectual property space around a portfolio. This assessment includes analysing the direct and cousin citation landscape and uses extensive calibration data that is adjusted to take into account the technology area and age of the portfolio.

The IP investment (family strategy) rating is composed of vectors that provide an initial measure of the sophistication of the patent prosecution strategy being pursued by the company. For example, the size of a patent family provides valuable information about the economic resources and strategic focus invested in the technology by its owner. A patent family includes applications in process (continuations, divisional applications, etc), as well as issued patents that are related in their patent prosecution histories. An issued patent that is part of a large patent family is likely to be more important than one that is not part of a patent family or is part of a smaller patent family.

Chart 3. **Top quartile rating recipients**

86.3% of companies with highly rated intellectual property positions are venture capital winners

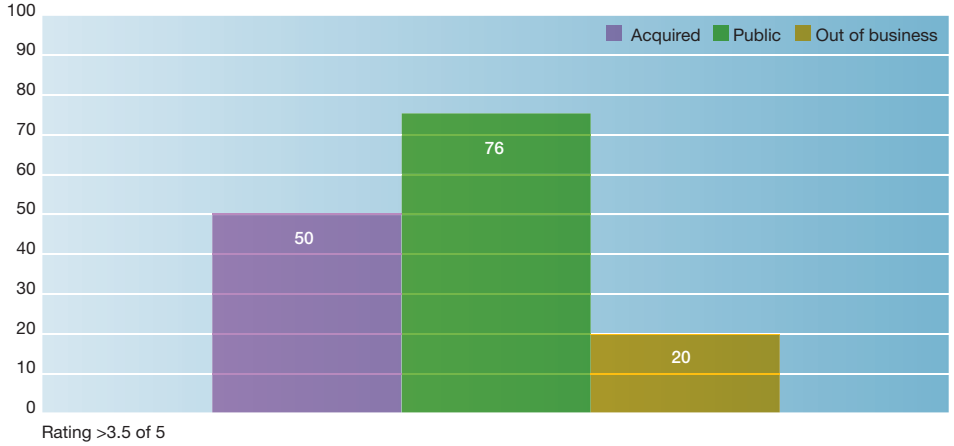
Acquired

Public

Note: Highly rated companies are over six time more likely to be winners than losers

Out of business

Note: Strong IP positions provide risk mitigation and residual value for investors in the event of business termination



Sample of 639 companies holding intellectual property from population of 9,000+
Criteria = upper five quartile venture capital firms as investor

“Analysis shows that across all sectors, a significantly higher percentage of venture capital-backed winners (companies that have been acquired or have gone public) have patent portfolios as opposed to losers (companies that are out of business)”

The ratings are based on publicly available US patent data and were run on over 9,000 portfolio companies of venture capital firms as reported by Dow Jones VentureSource and Thomson VentureXpert. The results reported in this article are based on the portfolios of five top quartile venture capital fund groups that collectively contain 1,025 portfolio companies, of which 639 have public record ownership of intellectual property.

Following are the research's major findings.

Intellectual property is an important component of value

Success in the venture capital industry is an exit: an acquisition of, or an initial public offering (IPO) by, a portfolio company. Analysis shows that across all sectors, a significantly higher percentage of venture capital-backed winners (companies that have been acquired or have gone public) have patent portfolios as opposed to losers (companies that are out of business).

Winners are many times more likely to hold intellectual property than losers. Although the presence of intellectual property portfolios is not perfectly correlated to success or failure, this indication alone should support executive and investor focus on the role of intellectual property in their decisions and actions.

While having intellectual property increases the probability of success, those who manage intellectual property well have even higher probability of success. In certain sectors, such as healthcare, data demonstrates the value of higher-quality portfolios. In other sectors, such as telecommunications or information technology, the effect is less prominent — although still clearly and demonstrably present.

Winners have a higher rating than losers

The quality and position ratings correlate with success. Winners have an average rating that is 21% higher than losers.

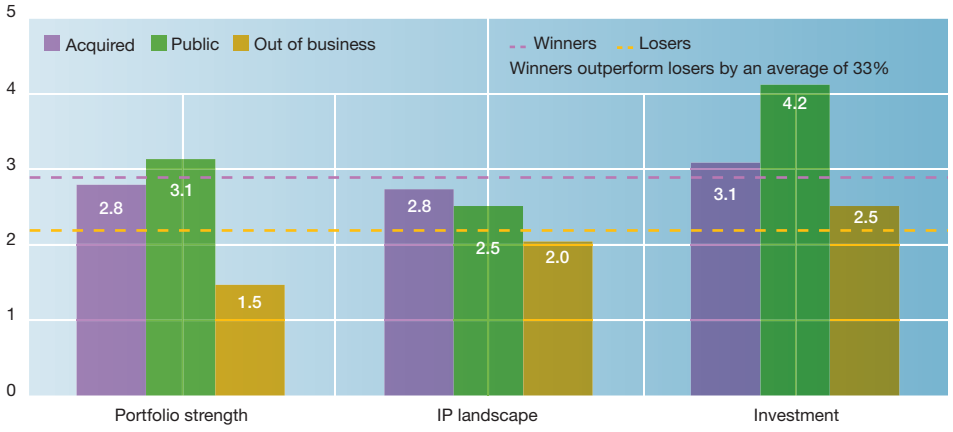
When tested across multiple venture capital firms and all of their portfolio companies' experiences, a clear distinction is seen between winners' scores and losers' scores and the assessed strength of their intellectual property position. Winners, on average, have a score of 2.5, while losers fall significantly lower with an average score of 2.1. A 20% differential is significant and over time can provide fundamental advantages to those persons and firms able to manage, screen and build to take advantage of this indicator.

Not only do winners have higher ratings than losers, but among companies with a rating of 3.5 or more (on a 1 to 5 scale), 86% are winners. Put another way, companies with high-quality IP ratings are over six times more likely to be winners than losers. Far fewer companies that have high ratings are no longer in business.

Given the many factors determining success beyond intellectual property rights alone, this differential provides a significant indicator and signals winning/losing likelihood in a consistent manner.

As consolation, for those 15% of companies that did not commercially succeed, a strong assessment or rating

Chart 4. **Ratings for venture capital-backed healthcare sector companies**



Sample of healthcare sector companies holding intellectual property from population of 9,000+
Criteria = upper five quartile venture capital firms as investor

indicates that investors may find additional value (or the sole remaining value) from their investments in the form of those companies' intellectual property positions.

Winners score higher across all three rating factors

The assessments score winners higher across all of the three key factors: IP portfolio strength; IP landscape position; and IP investment (family strategy).

For example, the chart above shows the average rating factors by outcome type for companies in the healthcare sector. A consistent presence is found in winning outcomes with companies attaining higher scores across each of the three perspectives. In the chart, the gap between healthcare winners' overall average rating (the upper horizontal dashed line) and healthcare losers' overall average shows how winners outperform losers by 33%.

Similar assessment gaps between winners and losers exist in other sectors, including those where time and pace of evolution often mean that managements do not implement significant intellectual property strategies. For example, in the broadly defined information technology sector (including software), the gap remains at over 10% – with more than two-thirds of companies achieving a successful outcome holding intellectual property.

Data supports the assertion that while the mere accumulation of intellectual property has value, a focus on high-quality and well-positioned IP investments is related to elevated performance.

Focus on IP as a component of business strategy

Recognising and incorporating IP strategy within business strategy and communications can often provide direct and indirect dividends.

Receive the positive returns from investments in quality

When offered the opportunity to increase one's potential for success by 10% or more at an incremental cost, few investors, or even gamblers, would pass on the opportunity. Too often, without an integrated strategy, firms under-invest in obtaining high-quality and strategically aligned protection for their valuable R&D and technological innovations. Management and corporate stakeholders alike are well served when business executives and their legal counsel resist the temptation to focus on commonly utilised measurements such as volume, size or expenditure. The incremental time and economic investments required to focusing on strategy and quality provide outsized returns.

Understand and communicate the business implications of your IP investments

If IP quality and position are seen as signals of good corporate stewardship, business executives and their counsel should pay heed to (or at least enter into) conversation around those positions. Context is crucial in understanding a company's IP and business strategy. Only a business's leadership and management are in a position to deliver a honed message to its customers, partners and investors about its business model and the role of IP in this. Neglecting the

conversation too often leads to a misconstrued or negative reaction about the business's IP plans. The role of IP and well-positioned, high-quality IP in supporting business success and innovative provides compelling information to firms seeking to demonstrate their effectiveness and value.

Actionable strategies

An initial assessment of a company's intellectual property position or of multiple firms in an industry is not a determining answer on whether the company is a good investment or acquisition candidate. However, important information is available to prioritise time and attention to those situations of greatest interest. With many sectors including dozens, if not hundreds, of early-stage companies, gaining a thorough understanding of the landscape is critical if one is to succeed.

Assessments of early-stage firms and their intellectual property holdings support the position that good intellectual property provides competitive advantages. In fact, merely holding intellectual property signals a greater likelihood of initial success. Those early-stage companies that develop stronger intellectual property positions possess even greater likelihood of success.

In addition to typically defined competitive commercial advantages, strong intellectual property positions build investor and partner confidence by signalling sound management. With competition between firms for capital, licensing partnerships and alliances under heightened pressure, management is served well when it includes intellectual property perspectives in business planning, strategic initiatives and investment decisions. *iam*

The authors are members of the management team of IPVision Inc, Boston

Joseph Hadzima is a senior member of the MIT Sloan faculty. **Bruce Bockmann** is a former managing director of Morgan Stanley

APPENDIX C – LISTING OF PATENTS PROVIDED BY PHARMACO

The following pages contain the listing of patents provided to IPVision by PharmaCo.

Note the error highlighted in yellow in the table “XYZ USE IN NEUROMUSCULAR THERAPY”

<NOTE: The Patent List has been removed from this Sample Report>

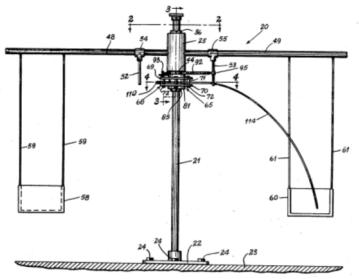
APPENDIX D – PATENT CLASSIFICATION SYSTEMS

What is a Patent Classification? Patent Offices use patent classification systems to enable searching and examination of patents by grouping patents together according to similar subject matter. The U.S. Patent and Trademark Office (USPTO) developed the U.S. Patent Classification (USPC) system. This is how the USPTO describes a Patent Classification:

> *"A Patent Classification is a code which provides a method for categorizing the invention. Classifications are typically expressed as "482/1". The first number, 482, represents the class of invention. The number following the slash is the subclass of invention within the class. There are about 450 Classes of invention and about 150,000 subclasses of invention in the USPC.*
>
> *Classes and subclasses have titles which provide a short description of the class or subclass. Classes and subclasses also have definitions which provide a more detailed explanation. Many Classes and subclasses have explicitly defined relationships to one another….*
>
> *A patent classification also represents a searchable collection of patents grouped together according to similarly claimed subject matter.*
>
> *A classification is used both as a tool for finding patents (patentability searches), and for assisting in the assignment of patent applications to examiners for examination purposes..… Classifications have hierarchical relationships to one another."*

What is a Class Hierarchy? The United States Patent Classification (USPC) System sets up a hierarchy of classes to describe areas of technology and invention. The following Class Hierarchy for "playground equipment" illustrates how a hierarchy is set up:

Example: Class Hierarchy for "Playground Equipment"



This is the drawing of the invention described in a patent entitled "Occupant-Propelled Roundabout Swing Set". A rider sitting in one of the swings can pull on a cable which causes the swings to rotate around the poll.

The USPTO placed this invention in Class 472/122: Amusement Devices/Swing/Having a hand operator/Cable grasp. This Hierarchy is illustrated as follows:

US Patent Class 472 - Amusement Devices		
106	SEESAW	
	107	Motor Operated
	108	Foot, hand or seat operated
	109	Having a safety feature
	etc	
116	BODY SLIDE	
	117	Water Slide
118	SWING	
	119	Motor operated
	120	Having hand and foot operator
	121	Having hand operator
	122	Cable grasp
	124	Having foot operator with separate suspender

The **Cooperative Patent Classification** (CPC) is a joint partnership between USPTO and the European Patent Office (EPO) where the Offices agreed to harmonize their existing patent classification systems (USPC and ECLA, respectively) and migrate towards a common classification scheme. As of June 1, 2015 US utility patents and applications are no longer published with USPC classes. Plant patents and design patents are the exception, and they will continue to carry a USPC designation.

The CPC has the following "top level" Sections:

A: Human Necessities
B: Operations and Transport
C: Chemistry and Metallurgy
D: Textiles
E: Fixed Constructions
F: Mechanical Engineering
G: Physics
H: Electricity
Y: Emerging Cross-Sectional Technologies

From the "top level" Section the classification hierarchy goes as follows:

Hierarchy

1. Section (one letter A to H and also Y)
2. Class (two digits)
   Subclass (one letter)
   Group (one to three digits)
   Main group and subgroups (at least two digits)

In the above example "A01B 35/16"

3. Section: A *(Human Necessities)*
4. Class: 01 (A01: Agriculture; Forestry; Animal Husbandry; Hunting; Trapping; Fishing)
   Subclass: B (A01B: Soil Working In Agriculture Or Forestry; Parts, Details, Or Accessories Of Agricultural Machines Or Implements, In General)
   Group: 35 (*A01B 35: Other machines for working soil)*
   Main group: 16 (A01B 35/16: with rotating or circulating non-propelled tools)

An example of a patent classified in A01B 35/16 is US 8393407 "Crop residue clearing device"

Abstract: Apparatus for clearing crop residue from a field is adapted for attachment to a tool bar of an agricultural implement or to a planter unit such that the apparatus is pulled through a field by the implement. The apparatus includes a support structure extending forward of the tool bar and at least one and preferably a pair of floating arms pivotally attached to a forward portion of the support structure and extending rearwardly, with a toothed wheel rotationally attached to an aft end of the arm(s). A coulter attached to the support structure is disposed between and extends forward of the soil-engaging toothed wheel(s) and in combination with the wheel(s) severs and removes residue in the seeding pathway. An adjustable biasing arrangement urges the toothed wheels, either in unison or independently, downwardly into engagement with the soil. Upper and lower stop limits are provided to limit vertical positioning of the toothed wheel(s).