

2012

# MOBILE PATENTS LANDSCAPE

## AN IN-DEPTH QUANTITATIVE ANALYSIS

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Introduction.....	4
Methodology .....	6
US vs. Europe.....	6
Mobile Patents – The Leaders .....	11
Overall .....	11
US vs. Europe .....	11
Mobile Operators .....	12
Platform Players.....	12
Infrastructure Providers .....	13
OEMs.....	13
Future Patents.....	14
Mobile Patent Analysis .....	15
Conclusions .....	22
About the Author .....	24

You take the blue pill and the story ends. You wake in your bed and believe whatever you want to believe. You take the red pill and you stay in wonderland and I show you how deep the rabbit-hole goes.

- Morpheus to Neo, *The Matrix*, 1999

## Disclaimer

*Chetan Sharma Consulting is one of the most trusted advisory firms on all aspects of Mobile Patents – ideation, writing patents, claim construction, valuation, IP policy and best practices, product and IP analysis, IP strategy, and legal disputes. The firm has analyzed and evaluated thousands of patents/applications and hundreds of patent portfolios from leading mobile companies around the globe.*

*This research document presents a quantitative assessment of the mobile patents landscape; however, the discussion in the paper shouldn't be construed as legal advice. The author or the company assumes no liability of any kind, whatsoever.*

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## Introduction

In April 2012, in its report on Intellectual Property, the US Patent Office (USPTO) concluded that *the entire US economy relies on some form of IP, because virtually every industry either produces or uses it.*<sup>1</sup> The foreword of the report said,

*“Innovation protected by IP rights is key to creating new jobs and growing exports. Innovation has a positive pervasive effect on the entire economy, and its benefits flow both upstream and downstream to every sector of the U.S. economy. Intellectual property is not just the final product of workers and companies—every job in some way, produces, supplies, consumes or relies on innovation, creativity, and commercial distinctiveness. Protecting our ideas and IP promotes innovative, open, and competitive markets, and helps ensure that the U.S. private sector remains America’s innovation engine.”*

Intellectual property has been an integral part of the economic engine of the western world for many decades if not centuries. Over the past two decades, nations and corporations have competed on the creation, funding, execution, and protection of the new ideas. Increasingly, the role of mobile devices, networks, and applications has become an important component of the growth story worldwide.

To say that the mobile devices have become the remote control of our lives would be an understatement. Mobile phones stay attached to us almost 24 hours a day. From waking us up in the morning to keeping us connected and entertained, from speeding up a commerce transaction to being a trusted advisor; mobile is fundamentally changed how we as consumers behave and how societies and cultures evolve over time. As a result, there has been a big influx of investment and innovation over the last decade. This surge of activity has also translated into increased number of patent filings in the two major jurisdictions of US and Europe. Even the developing countries like China and India have seen a significant increase in patent activity in the country. In fact, in terms of filings, China’s share of the global patent grants has increased from 0.8% in 1996 to 15% in 2010 placing it third behind Japan and the US and well ahead of Korea and Europe.<sup>2,3</sup>

According to the US Patent Office (USPTO), in 2011, the number of applications reached over 535,000 growing by almost 54% from a decade ago. Similarly, the number of patents granted grew 35% to 224,505 by the end of 2011.<sup>4</sup> The numbers of foreign filings are now in the majority for both the applications filed as well as the patents granted. In

<sup>1</sup> Intellectual Property and the US Economy: Industries in Focus, USPTO, March 2012

<sup>2</sup> WIPO – World Intellectual Property Indicators 2011

<sup>3</sup> The patent granting criterion for different offices can vary quite a bit. The USPTO and EPO are relatively stricter in their patent grants than CPO and patent offices in other developing countries.

<sup>4</sup> Source: Based on USPTO data, 2012

Europe, similar trends were observed where the EPO (European Patent Office) patent grants increased by 46%.<sup>5</sup>

The number of mobile related patents that were granted by the USPTO and the EPO increased significantly over the course of last decade. The US market saw a 390% increase while the European market saw a 173% increase in mobile related patent grants.<sup>6</sup>

Another interesting fact is that as of Q1 2012, over 21% of the patents granted by the USPTO now are mobile related. This grew from around 2% in 1991 and 5% in 2001. In Europe, roughly 9% of the patents granted are now related to mobile.

Chetan Sharma Consulting analyzed almost 7 million patents granted by the USPTO and EPO over the last two decades to understand how mobile has become a key enabler for all technology companies. Furthermore, we looked at patent granted to the top 65 technology companies who are active in the mobile space to understand their relative strengths and weaknesses in the mobile patents landscape. In a first of its kind study, the paper presents and discusses these findings in more detail.<sup>7</sup>

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<sup>5</sup> Source: Based on EPO data, 2012

<sup>6</sup> Source: Chetan Sharma Consulting, 2012

<sup>7</sup> The 65 companies don't include non-practicing entities. The bottom part of the long-tail is representative companies in the ecosystem, not necessarily the top companies by rank. For example, there are several companies who have more patents in the mobile space which are not on the list. Facebook was picked because it is perhaps more relevant to the mobile space. Any omission is unintentional.

## Methodology

The two most important IP jurisdictions for the mobile industry are that of the US and Europe.<sup>8</sup> Chetan Sharma Consulting analyzed patent filings and granted patents in these two territories from the last 20 years: 1991 – 2012 and specifically looked at the mobile related patents for the 65 top companies in the mobile ecosystem. For the purposes of this analysis, we only looked at the relevant (active) mobile patents during 1995-2012<sup>9</sup> which is the time period for the validity of the patents. For e.g. between the studied time period, IBM has been granted the most number of patents of any company in the mobile segment but only 16% of their patents are relevant to the mobile ecosystem. There are others like Qualcomm and RIM whose Mobile/Overall ratio is over 80%.

Doing the patent analysis over a long-period gives us an understanding of the strategy and product direction of the leading players in one of the most important industries of the knowledge economy. During the 1995-Q1 2012 time period, the USPTO and EPO granted a total of almost 6 million patents. The USPTO accounted for roughly 51% of the total patents. During the same time period, the total number of mobile related patents was 489,259 with the USPTO accounting for roughly 63% of the patents.

## US vs. Europe

For much of the last decade, the US and the European patent trends were similar in nature, both in terms of the total number of patent grants as well as the number of mobile related patents that were granted during the decade.

However, around 2004, things started to change and quite drastically. While the European market continued at its steady pace, the US market really took off for mobile patents so much so that by Q1 2012, the US market was granting the mobile patents at 2.5x rate than its European counterparts. As shown in figure 1, the disparity between the two jurisdictions is quite evident in the last 4-5 years.

<sup>8</sup> Japan and China are two other patent powerhouses, Japan the traditional one, and China the emerging one, however, for mobile, US and Europe tend to have the most activity. The WIPO office reported that in 2011, the top 4 applications were from China and Japan - ZTE, Panasonic, Huawei, and Sharp respectively. Robert Bosch from Germany and Qualcomm from US made up the top 6. In Europe, Germany, France, and UK are the top applicants. Samsung and LG make Korea one of the top 5 countries that file for patent applications.

<sup>9</sup> Since 1995, a patent granted in the US is valid for 20 years from the date of filing. Given that it roughly takes 3 years to gain a patent, we focused on the 17 year validity period of patents. For 2012, only patents granted till January 2012 are considered in the analysis.

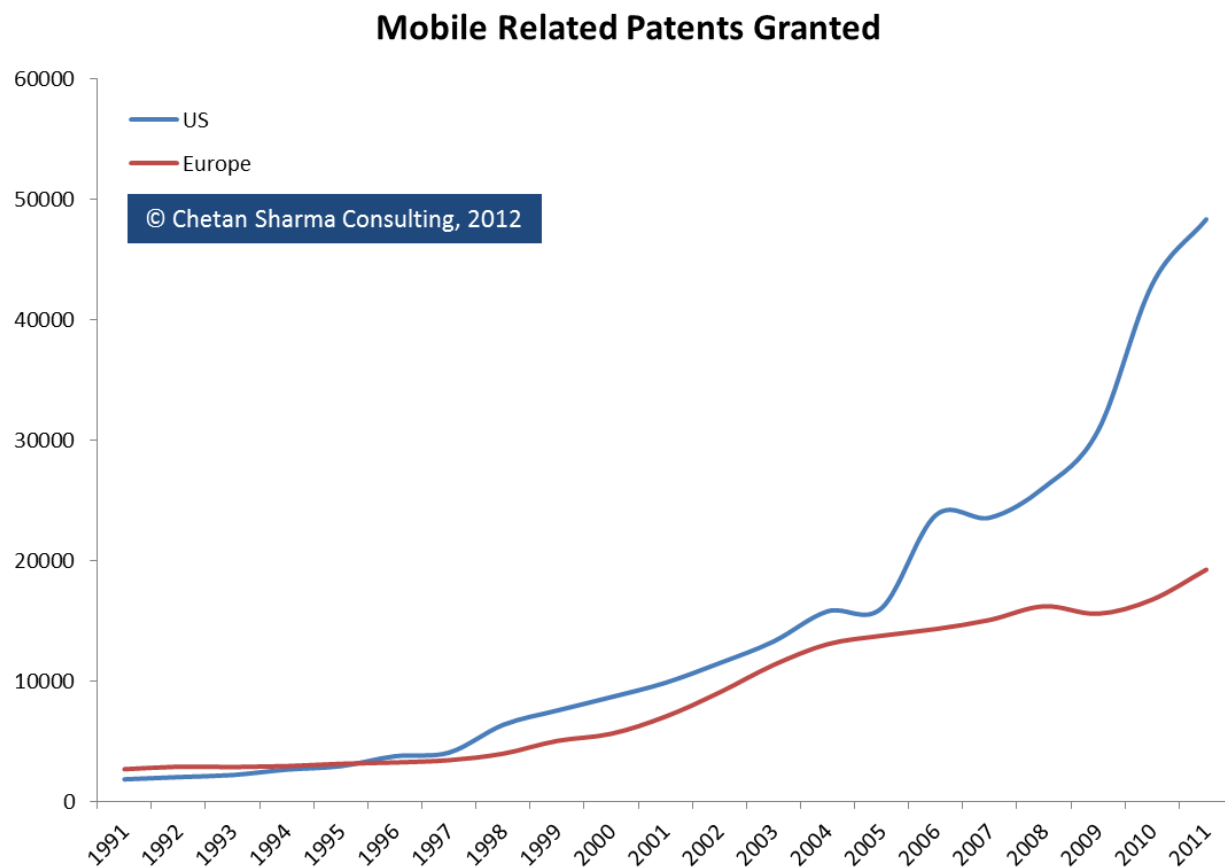


Figure 1. Mobile Related Patents Grants: US vs. Europe (1991-2011)<sup>10</sup>

A more startling observation is the mobile patent grants as a percentage of the total patent grants in a given year have risen significantly for the US market indicating the importance innovators attach to mobile in their business. **In the US, one out of every five patent granted in 2011 and in Q1 2012 was related to mobile.** Less than a decade ago, this number was less than 10%. The European market has seen lower growth relative to the US market. Roughly one out of every ten patents granted in Europe are mobile related.

There are a couple of main reasons for this significant disparity between the two jurisdictions:

- **Software patents cases** – In 1998, the federal circuit issued its landmark decision on *State Street Bank & Trust vs. Signature Financial Group* decision, which put the surge of software patents in the following decade in motion.

<sup>10</sup> Source: Chetan Sharma Consulting, 2012

*In this case, Signature Financial had obtained a patent on a "Hub and Spoke" method of running mutual funds. In this method, several mutual funds (or "spokes") pool their investment assets into a single investment portfolio (the "hub"). Software then determines the value of each fund based upon a percentage ownership of each of the assets in the hub portfolio. This information is tracked on a daily basis, and is used to track fund share pricing and tax accountability. State Street Bank asked the court to declare this invention to be unpatentable as a mere mathematical algorithm or as a business method. The Federal Circuit rejected the arguments of State Street Bank, and instead upheld the patent by explicitly stating that business methods can form patentable subject matter. The court emphasized that software or other processes that yield a useful, concrete and tangible result should be considered patentable.<sup>11</sup>*

### Granted Patents: Mobile Patents as a % of Total Patents

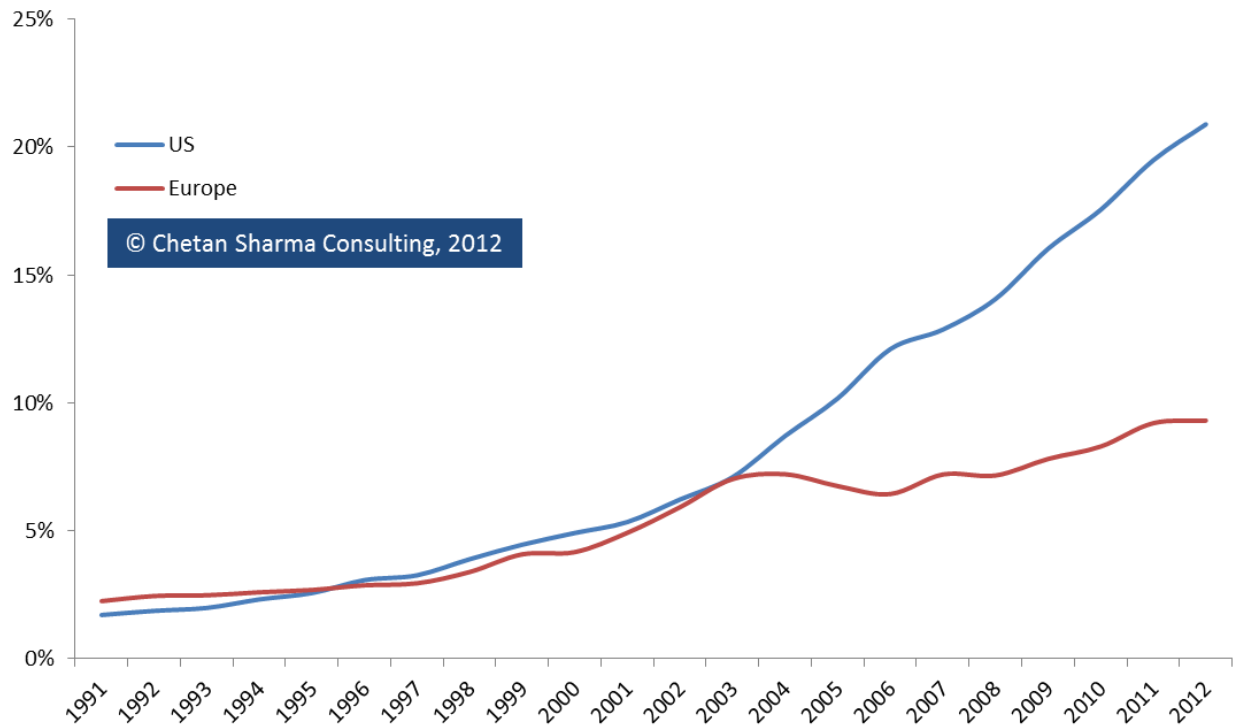


Figure 2. Mobile Patents as a percentage of the Total Patents: US vs. Europe (1991-2012)<sup>12</sup>

This led to an increase in software patents and the granted patents started appearing around the 2002-2003 timeframe. The European Patent Office was

<sup>11</sup> The History of Software Patents: Benson, Flook, and Diehr to Bilski and Mayo v. Prometheus.

<sup>12</sup> Source: Chetan Sharma Consulting, 2012



still adverse to the software and the business method patents,<sup>13</sup> so the overall number of patents from the two jurisdictions started to diverge. They had been tracking fairly well in the past decades.

Later on, there were two cases in the US courts: *KSR vs. Teleflex* in 2007 and *Bilski vs. Kappos* in 2008 that pulled back on the software patenting ruling earlier but they did little to narrow the gap between the number of patents filed in US vs. Europe.

The software patents also included a number of mobile patents and as such there was a sharp increase around 2008 coinciding with the advent of iPhone, Android, 3G, and the whole appstore phenomenon.

### US vs. Europe in Mobile Patents Grants (1991-2012)

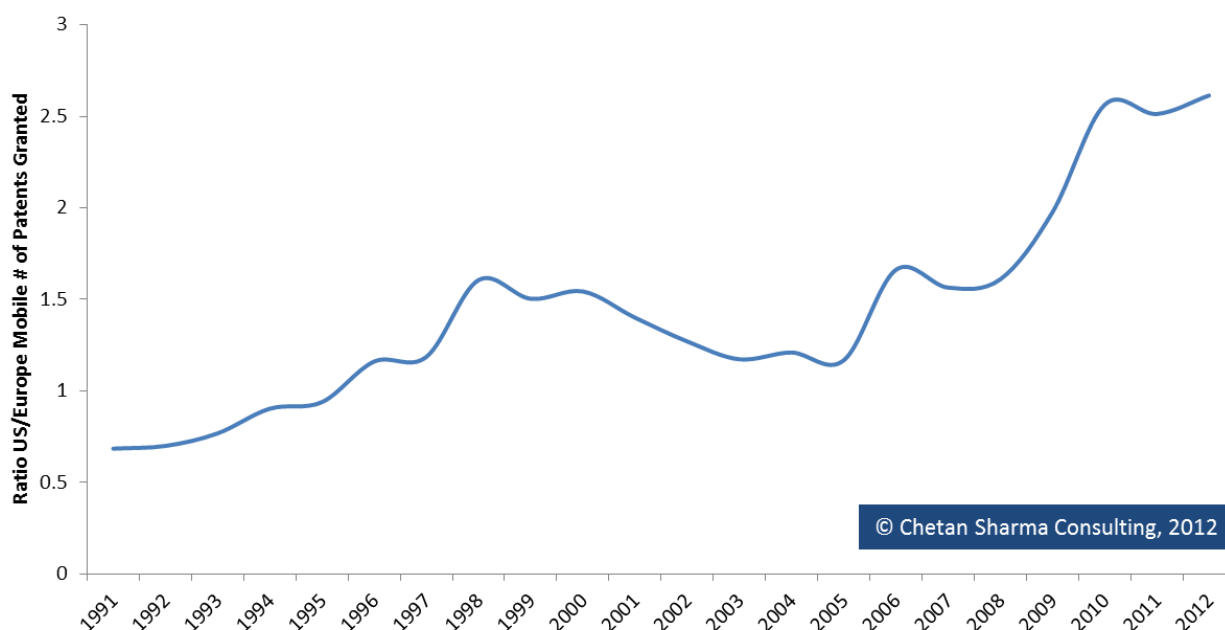


Figure 3. US vs. Europe in mobile patents grants (1991-2012)<sup>14</sup>

- Mobile investment and innovation shifted to the US** – Another significant reason for the gap between the US and Europe in mobile patents was due to the fact that by the mid-2000s, the mobile innovation gravity moved to the US with software driving the industry. Big (and small) players took notice and started investing more in the US market relative to Europe and that included the strategy to protect their intellectual property.

<sup>13</sup> Software Patent Law: US and Europe Compared, Michael Guntersdorfer

<sup>14</sup> Source: Chetan Sharma Consulting, 2012

For example, one of the most prolific patent grantee in the recent past– Samsung had only 441 mobile patents in the US between 1995-2006 in the US compared to 1688 in Europe. However, during 2007-12, Samsung was granted 5651 patents compared to 3615 in Europe. Even Nokia, an European powerhouse, which didn't even compete well in the US market, was granted 10% more patents in the US vs. Europe for the time period 2007-2012 relative to 1995-2006.

Microsoft, which by far has the most number of software patents, the before (1995-2006) and after (2007-2012) numbers were 26% and 81% respectively – meaning they were granted 26% more US patents than Europe during 1995-2006 and this number jumped to 81% in the last 5 years.

## Quantity vs. Quality

The value of the company is increasingly tied with the intangible assets that include its intellectual property. Over the past decade, the intangibles have accounted for roughly 57% of the global enterprise value that is approximately \$60 trillion.<sup>15</sup> The investment trends have also shifted towards the intangibles. If we look at the last 50 years of investment as a function of the GDP in the US, the intangibles used to account for roughly 4% vs. the tangibles over 9%. By 2007, both segments were roughly 8-9% of the GDP thus intangibles are as important as the tangibles.<sup>16</sup> Similarly, in some of the major billion dollar M&A transactions, the intellectual property value of the acquiree is generally equal or greater than the purchase price.<sup>17</sup>

The value of a patent portfolio is determined by the quality of the patents.<sup>18</sup> The total number of patents granted while not critically important in assessing the value of the portfolio does play an important role in determining the importance of the portfolio. The breadth of patent coverage determines how much a company has invested and Patent Office's view of that investment. The quantity also comes into play during the M&A or licensing transactions. The bigger the portfolio, typically, higher the valuation. Of course, the valuation is dependent on the quality, prior art, fundamental and essential technology patents, citations, relevance to the standards, relevance to the technology in use, and other factors but the size of the portfolio also plays an important role in the discussion and the eventual valuation of the patent portfolio or the company itself.

In legal disputes, the discussion is generally limited to a few relevant patents. However, given that 90%+ disputes get resolved in settlements and/or cross-licensing/licensing agreements, the quantity of patents come into play in those scenarios as well.

<sup>15</sup> Source: Brand Finance, 2011

<sup>16</sup> Intangible assets and national income accounting: Measuring a scientific revolutions, Leonard Nakamura, Federal Reserve Bank of Philadelphia, 2009

<sup>17</sup> Properly evaluating a target with intellectual property rights, David Drews, 2011

<sup>18</sup> Patent portfolio quality analysis is outside the scope of this paper

## Mobile Patents – The Leaders

The research study looked at 65 leading companies and then analyzed some sub-segments like operators, platforms, OEMs, and infrastructure providers. This section presents the top 10 ranking for each of the categories. The ranking is based on the patent grants in both US and Europe.

### *Overall*

Not surprisingly, companies who have been around for a while especially in the infrastructure and the platform space lead the overall mobile patents chart with Nokia and Samsung emerging as the top two players.

	Overall Mobile Patents (1995-2012)	Mobile Patents Granted in 2011
<b>1</b>	Nokia	Samsung
<b>2</b>	Samsung	IBM
<b>3</b>	Alcatel-Lucent	Sony
<b>4</b>	Ericsson	RIM
<b>5</b>	Microsoft	Microsoft
<b>6</b>	IBM	Qualcomm
<b>7</b>	Sony	Ericsson
<b>8</b>	NEC	LG
<b>9</b>	Motorola	Panasonic
<b>10</b>	Qualcomm	Nokia

Source: Chetan Sharma Consulting, 2012

### *US vs. Europe*

	US Leaders	Europe Leaders
<b>1</b>	IBM	Alcatel-Lucent
<b>2</b>	Microsoft	Nokia
<b>3</b>	Nokia	Samsung
<b>4</b>	Samsung	Sony
<b>5</b>	Ericsson	Ericsson
<b>6</b>	Sony	RIM
<b>7</b>	Motorola	NEC
<b>8</b>	Intel	NTT DoCoMo
<b>9</b>	Alcatel-Lucent	Siemens
<b>10</b>	Qualcomm	Qualcomm

Source: Chetan Sharma Consulting, 2012

## ***Mobile Operators***

The US mobile operators led by AT&T have a strong showing in the operator rankings primarily due to the strength of their US portfolios.

Overall Mobile Patents	
<b>1</b>	AT&T
<b>2</b>	NTT DoCoMo
<b>3</b>	Sprint
<b>4</b>	British Telecom
<b>5</b>	Verizon
<b>6</b>	T-Mobile
<b>7</b>	Swisscom
<b>8</b>	Telecom Italia
<b>9</b>	SK Telecom
<b>10</b>	TeliaSonera

Source: Chetan Sharma Consulting, 2012

## ***Platform Players***

While Apple and Google dominate the mobile platform space, from the patent portfolio perspective, Samsung, Microsoft, and IBM are the top three.

Overall Mobile Patents	
<b>1</b>	Samsung
<b>2</b>	Microsoft
<b>3</b>	IBM
<b>4</b>	Qualcomm
<b>5</b>	RIM
<b>6</b>	Intel
<b>7</b>	Oracle
<b>8</b>	Apple
<b>9</b>	Google
<b>10</b>	Amazon

Source: Chetan Sharma Consulting, 2012

## ***Infrastructure Providers***

Given that Samsung is into infrastructure, devices, and components, its portfolio are more diverse and potent compared to some of its competitors.

Overall Mobile Patents	
<b>1</b>	Samsung
<b>2</b>	Alcatel-Lucent
<b>3</b>	Ericsson
<b>4</b>	NEC
<b>5</b>	Motorola
<b>6</b>	Qualcomm
<b>7</b>	Siemens
<b>8</b>	LG
<b>9</b>	Fujitsu
<b>10</b>	HP

Source: Chetan Sharma Consulting, 2012

## ***OEMs***

Nokia might be losing its overall device market share and its smartphone share is dropping like a rock but its patent portfolio is strong as ever. Samsung, Sony, NEC, and Motorola wrap up the top five listings.

Overall Mobile Patents	
<b>1</b>	Nokia
<b>2</b>	Samsung
<b>3</b>	Sony
<b>4</b>	NEC
<b>5</b>	Motorola
<b>6</b>	RIM
<b>7</b>	Siemens
<b>8</b>	LG
<b>9</b>	Fujitsu
<b>10</b>	Hitachi

Source: Chetan Sharma Consulting, 2012

## Future Patents

It is also worthwhile to take a look at the pipeline of pending patent applications for it shows the relative investment and the strength of the portfolio in the future. It is also useful to understand the recency of the activity i.e. if the filing of these patents started only recently or have the patent filings been part of a sustained investment effort. Figure 4 looks at the top 20 mobile patent assignees in the US. Samsung, Microsoft, IBM, Sony, and Qualcomm are amongst the top 5 with a very healthy pipeline of intellectual property for the next 5-10 years. Typically, 40-50% of the filed applications get approved.<sup>19</sup>

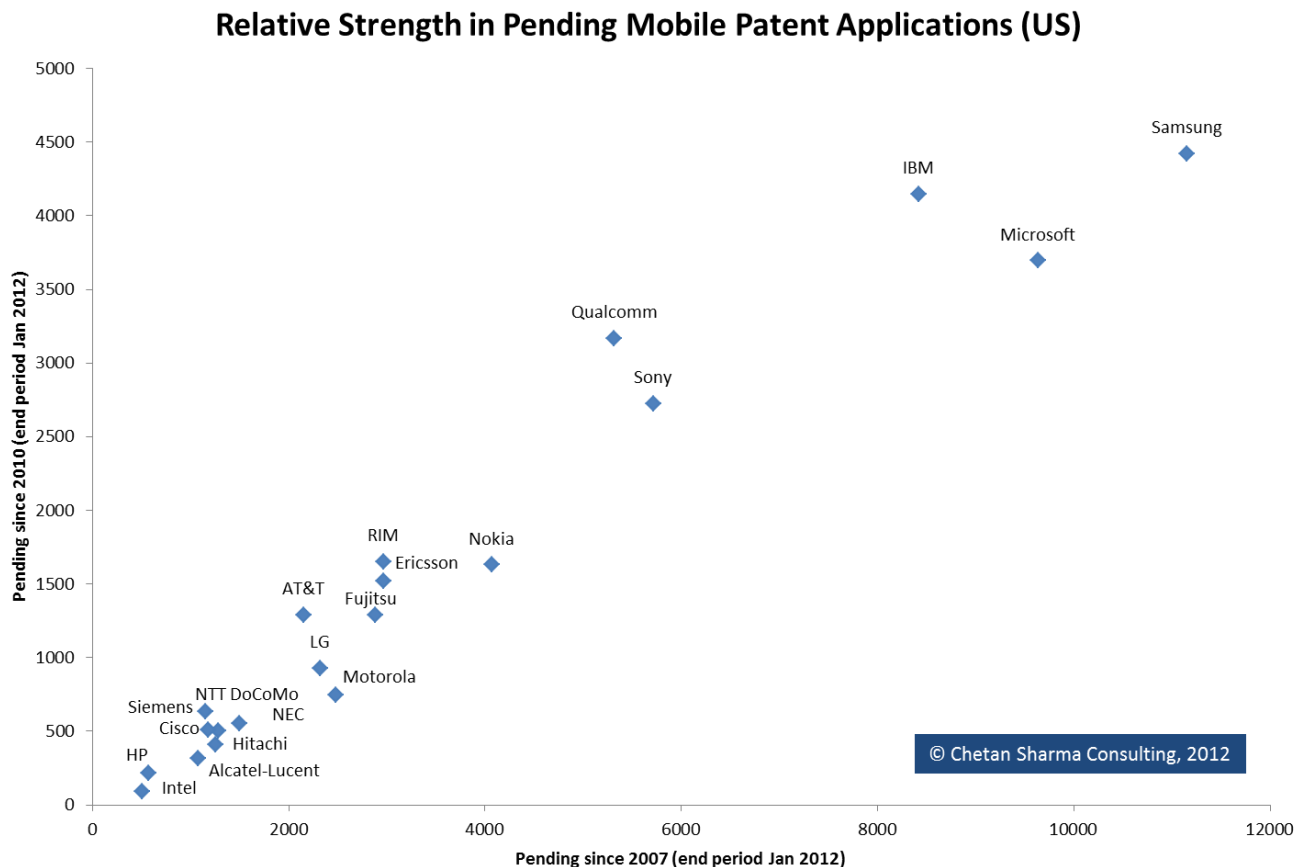


Figure 4. Relative strength in pending mobile patent applications (US)<sup>20</sup>

<sup>19</sup> Source: USPTO

<sup>20</sup> Source: Chetan Sharma Consulting, 2012

## Mobile Patent Analysis

We live in a knowledge economy and Intellectual Property is a key asset in this new ecosystem. *Good Patents* are one of the essential elements to creating barriers to entry for rivals, building credibility and confidence of investors, customers, partners, and employees, providing clarity as to the property ownership, demanding leverage from the industry, and for generating revenue from licensing and sale.<sup>21</sup>

While the value of good patents is universally accepted, only a handful of companies have active programs that are embedded within their organization to capture and enforce the IP and Patent rights. Even some of the most innovative companies with the broadest patent portfolios fail to recognize the value of their IP assets. While they amass a significant number of valuable patents over time, they remain oblivious of their value in the market place and their ability to extract revenue stream. This results from the mindset of treating corporate legal and IP departments as cost centers rather than groups of strategic importance for the company that can produce significant value to the company. One has to recognize that there is more to IP than just putting a line item in the financial statements. The group dealing with IP and patents should be handled under corporate and strategic management.<sup>22</sup>

This section presents the analysis of the mobile patent portfolios of 65 leading companies in the US and the European market (Figures 5-9). Figure 5 looks at the aggregate count of the mobile patents granted that are active. Nokia, Samsung, Alcatel-Lucent, Ericsson, Microsoft, IBM, and Sony form the top tier players followed by NEC, Motorola, Qualcomm, RIM, and Intel. After that the long-tail begins.

If we look at the markets individually, in the US market, IBM, Microsoft, Nokia, Samsung, and Ericsson form the top 5 while in Europe the group is led by Alcatel-Lucent, Nokia, Samsung, Sony, and Ericsson.

Figure 6 looks at the recency of the mobile patents in relation to the overall mobile patent portfolio. It gives us insights into how soon long has a company been investing in mobile. For the analysis we looked at the percentage of the mobile patents that were granted in the last 5 years vs. the total number of active patents since 1995. The figure shows different groups of players.

- **Group I** – Companies that have been around the block and have substantial number of patents since 1995. They have a good number of fundamental and

<sup>21</sup> For a detailed treatment of the patenting process, please refer “Inside the USPTO: A guide to the patenting process” by Carlos Villamar and Chetan Sharma - <http://www.chetansharma.com/insidetheuspto.htm>

<sup>22</sup> For a detailed treatment of understanding and creating higher value from the patent portfolio, please refer to our paper on **Patent Portfolio Quotient™**, a unique methodology developed by Chetan Sharma Consulting that maximizes value of the portfolio. It is discussed in detail in “What is your Patent Portfolio Quotient?” by Chetan Sharma <http://chetansharma.com/patentportfolioquotient.htm>

essential patents. Companies like Ericsson, Alcatel-Lucent, and Nokia fall in this category.

- **Group II** – These companies have significant amount of patents but only started to pay attention to mobile patents in the last 5-8 years or so. Companies like Samsung, Microsoft, IBM, and Sony fall in this bucket.
- **Group III** – There are companies like Openwave and Oracle who have relatively smaller mobile portfolio but they have been investing in mobile for a long time such that their last 5 year patent haul accounts for less than 30% of their overall portfolio.
- **Group IV** – There are number of companies in the mid-band who started investing early but have built a strong portfolio over the last 5-8 years like Qualcomm, RIM, Intel, AT&T, and others.
- **Group V** – These are companies that have a smaller portfolio of mobile patents but have built the portfolio over the course of the last decade. Companies like Sprint, Verizon, Dell, T-Mobile, and Orange fall in this group.
- **Group VI** – This is the newbie class that has turned their focus on mobile in only the last 5 years or so. As such their mobile portfolio was primarily built in the last 5 years or so. Companies like Amazon, HTC, Google, ZTE, Lenovo, Adobe and Apple have approximately 90% of their mobile patents granted in the last 5 years. For platform players like Amazon and Google, most of their mobile patent activity is fairly recent.

Figure 7 shows the list of companies by mobile patent grants in 2011. It follows the overall mobile patent rankings with few exceptions. RIM and Qualcomm make it into the top 10 while Nokia and Alcatel-Lucent slipped in the rankings.

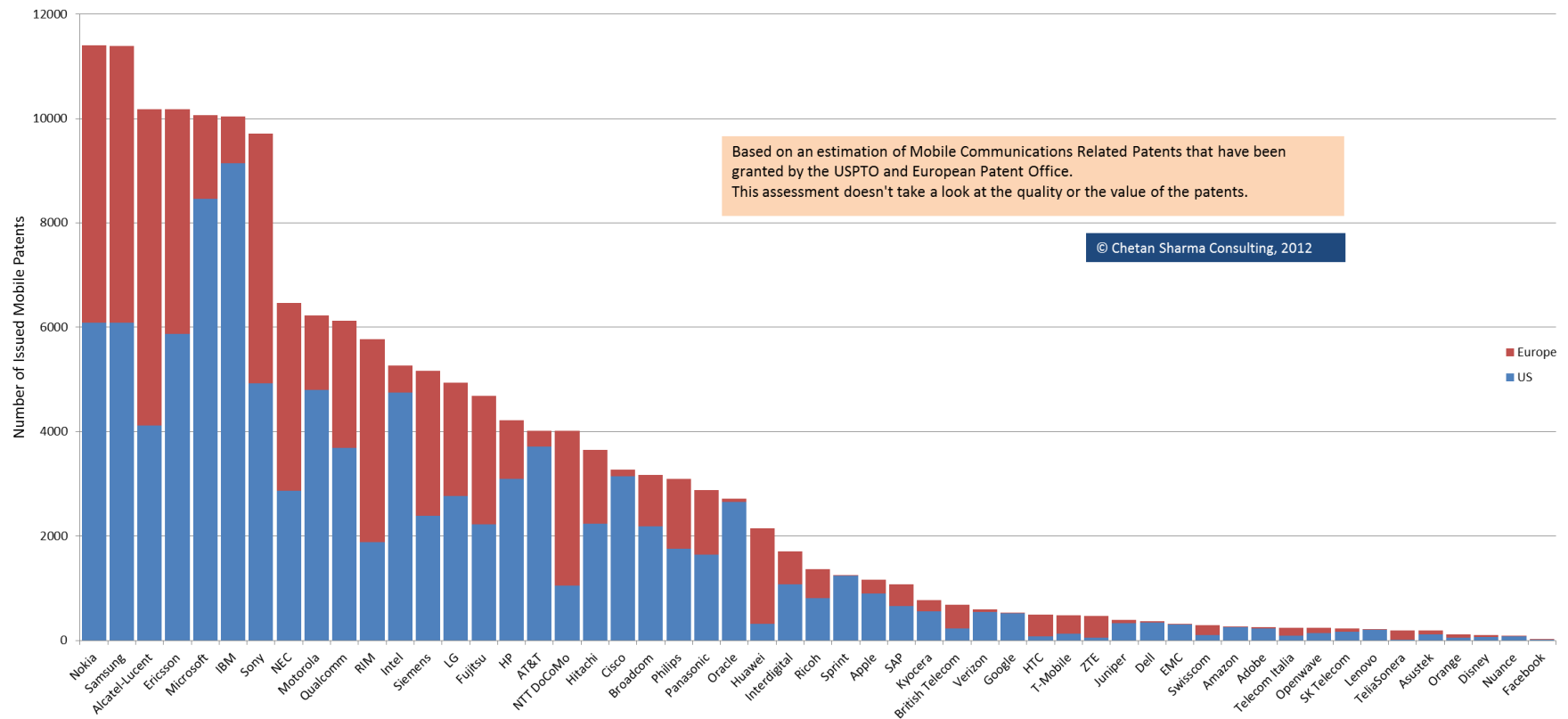
Figure 8 looks at the value a company ascribes to mobile as measured by the percentage of the overall patents that a company has that are mobile related. IBM and Samsung have the most number of patents but mobile patents account for less than 20% of their overall portfolio. Given they lead in the total number of mobile patents as well show the diversity of their strong portfolio. On the other end of the spectrum are companies like Openwave and Swisscom where 90% of their patent portfolio is focused on mobile thus indicating higher degree of concentration of mobile patents in their portfolio.

Figure 9 studies the relative strengths of different mobile patent portfolios in the US and Europe. IBM and Microsoft are stronger in the US while Ericsson, Samsung, Sony, and Alcatel-Lucent are stronger in the European market.

By studying these figures, one can get a sense of the leaders in the mobile patent portfolio and their relative strengths and weaknesses.



Mobile Related Issued Patents - US and Europe - 1995-2012

Figure 5. Mobile related issued patents in US and Europe (1995-2012)<sup>23</sup><sup>23</sup> Source: Chetan Sharma Consulting, 2012

## Mobile Patent Portfolio of Leading Players

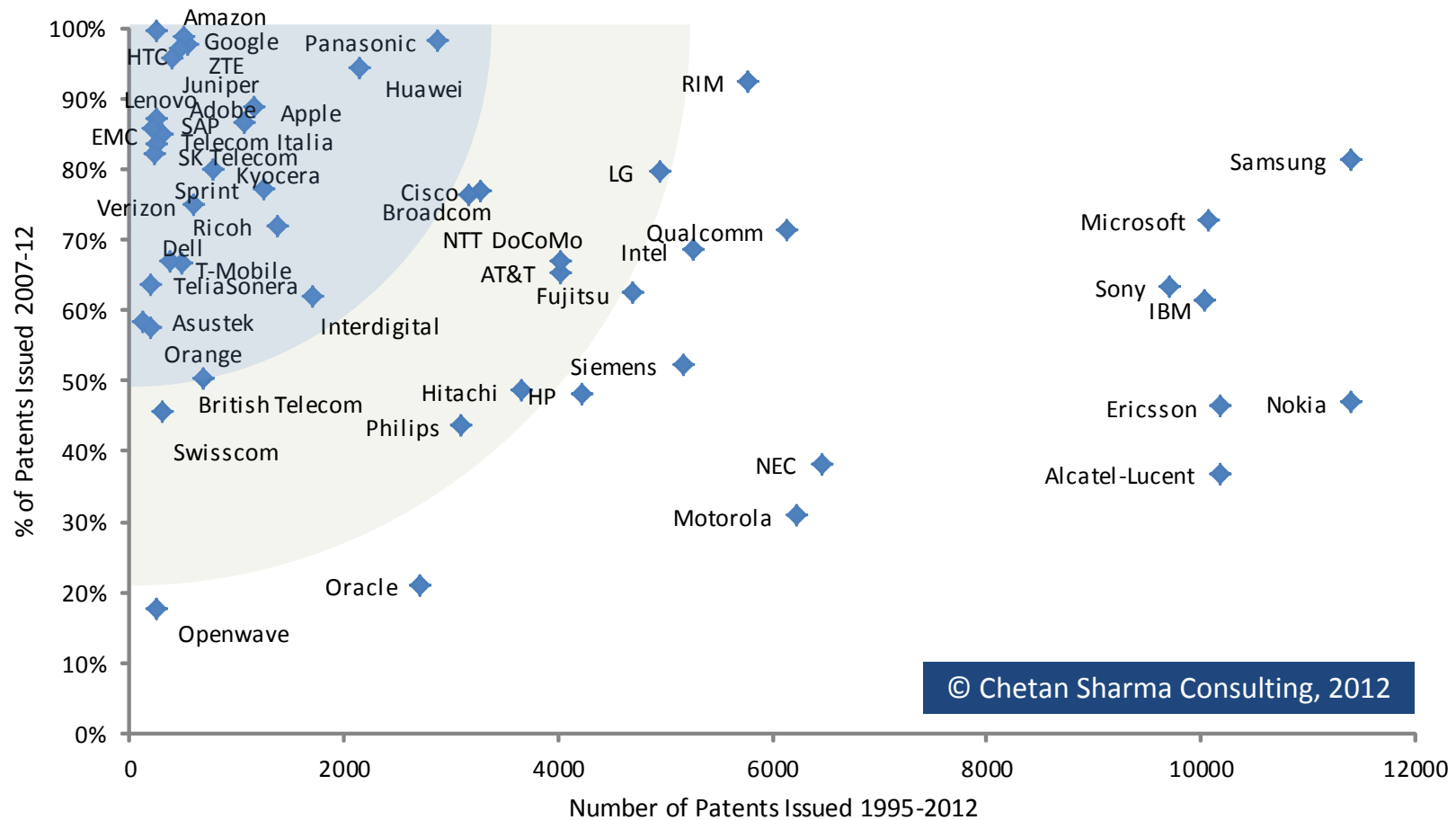
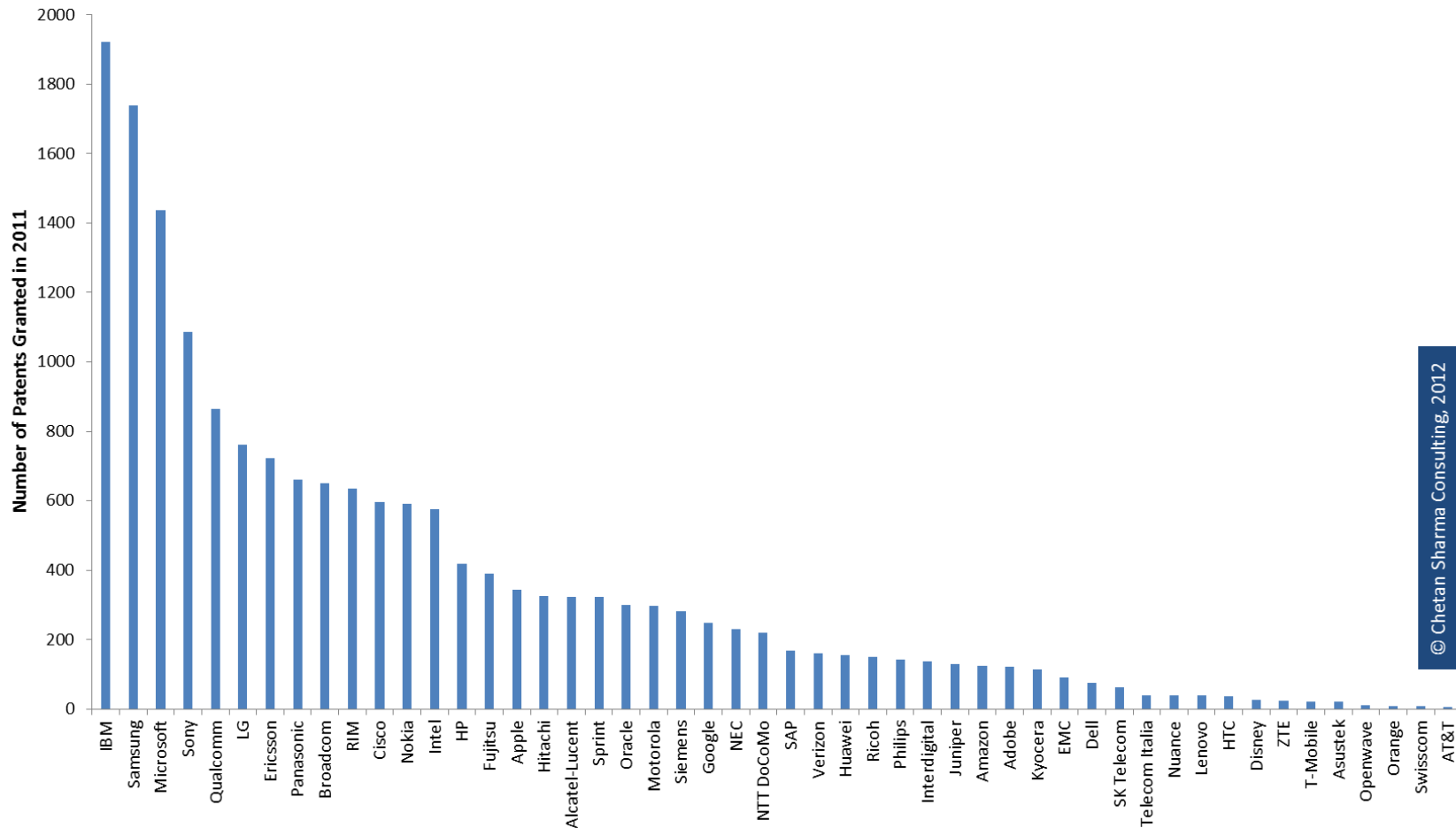


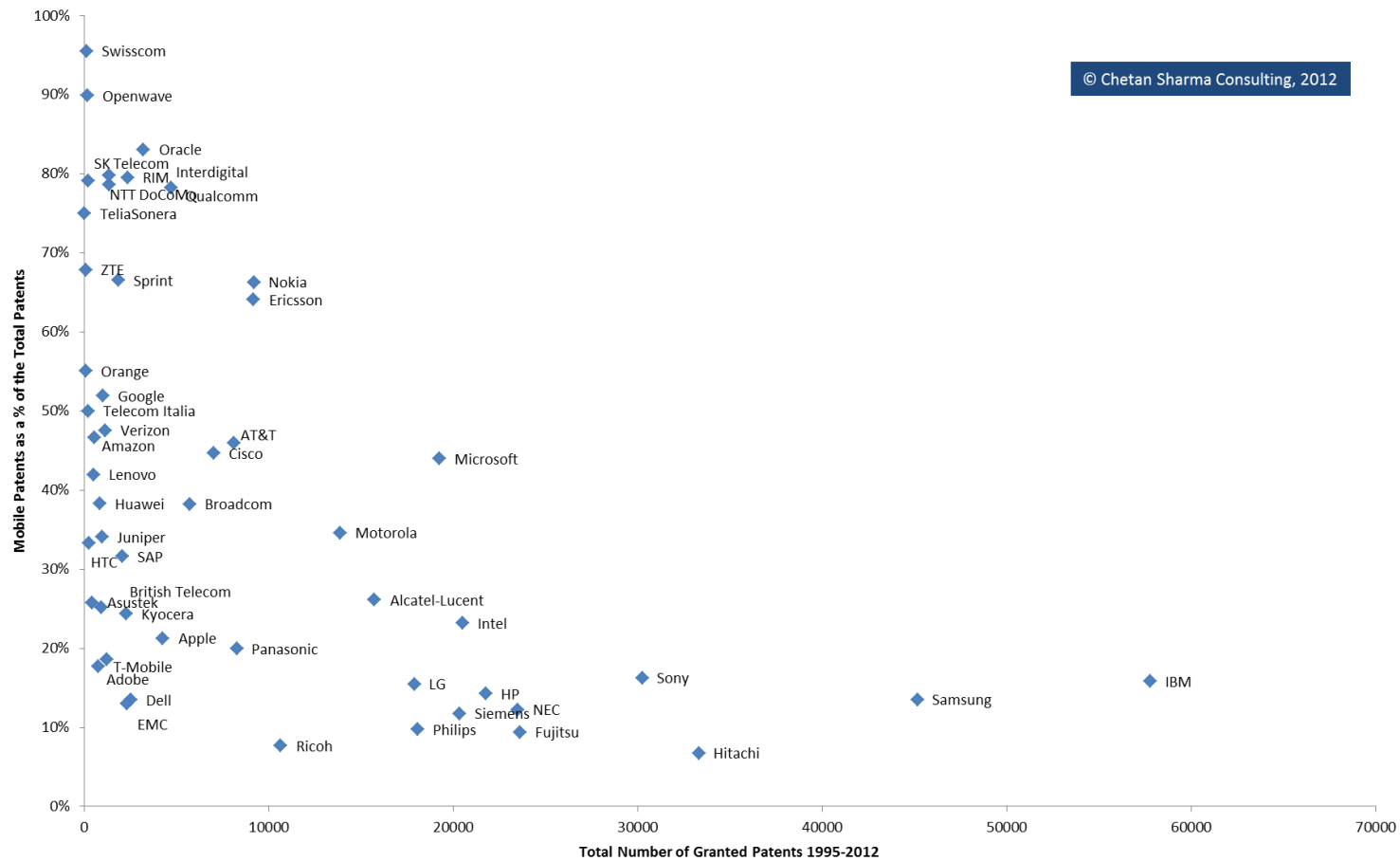
Figure 6. Mobile patent portfolio of leading players<sup>24</sup>

<sup>24</sup> Source: Chetan Sharma Consulting, 2012

## US Mobile Patent Grants - 2011

Figure 7. US Mobile Patent Grants in 2011<sup>25</sup><sup>25</sup> Source: Chetan Sharma Consulting, 2012

## Mobile Patent Portfolio of Major Players: Focus on Mobile

Figure 8. Mobile Patent Portfolio of major players: Focus on Mobile<sup>26</sup><sup>26</sup> Source: Chetan Sharma Consulting, 2012

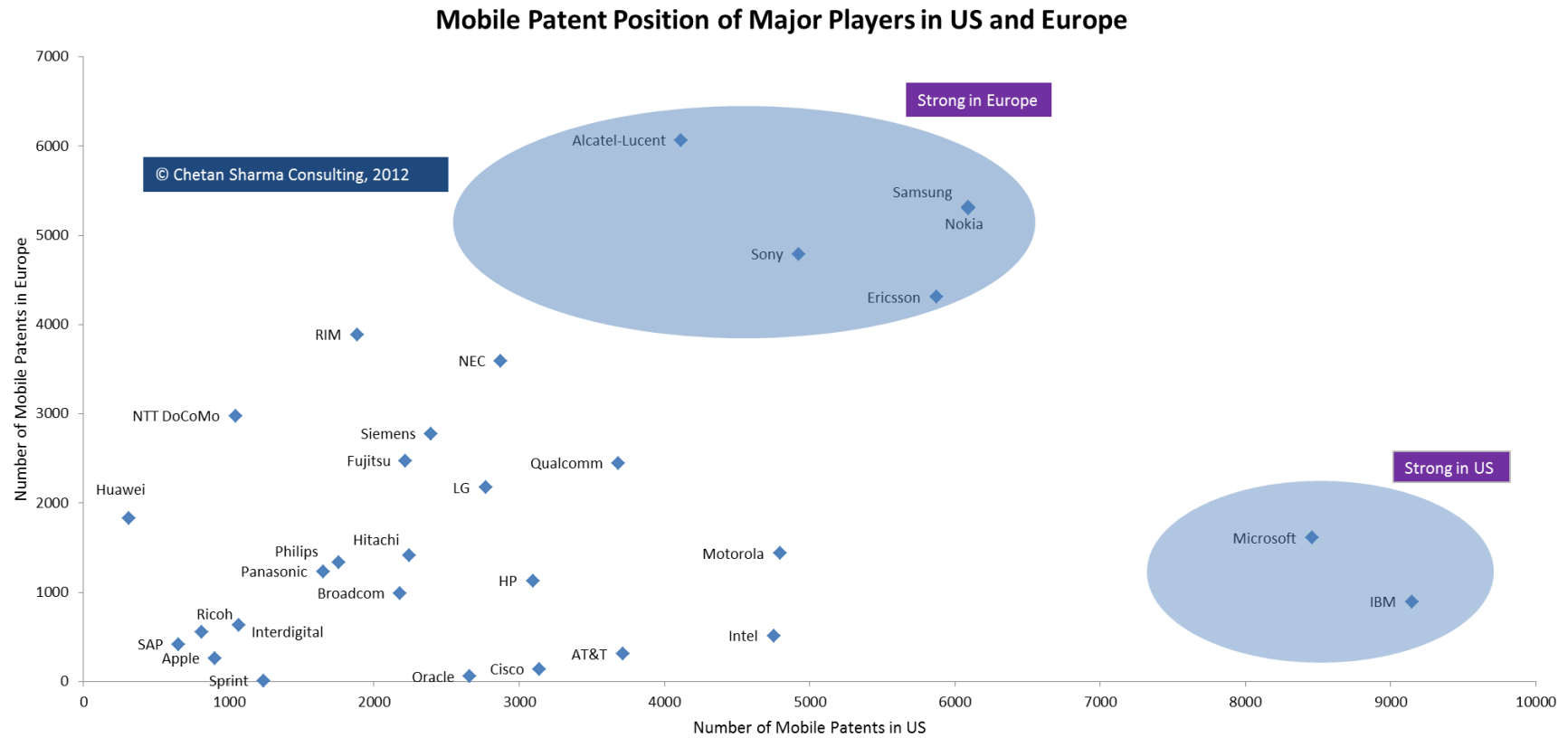


Figure 9. Mobile Patent Portfolio of Major Players in US and Europe<sup>27</sup>

<sup>27</sup> Source: Chetan Sharma Consulting, 2012

## Conclusions

Mobile is becoming *the* most critical tool to drive human ingenuity and technological growth. It is useful to understand the mobile patent landscape, the companies that are shaping up the ecosystem, their respective strengths and weaknesses, and how their strategies are evolving in the key jurisdictions of the US and European markets. This study presents and discusses several key areas of interest that explain the product choices and strategies these players are pursuing. It is also fairly evident that mobile patents are not just important for the mobile ecosystem but to the larger technology industry as well as is evident by the increasing mobile to total patents ratio. Current trends suggest that by 2013, a quarter of all patents filed in the US will be mobile related. Mobile will continue to be engine of the knowledge economy and the companies who understand the value of the intellectual property will continue to protect and benefit from their investments for years to come.

## Acknowledgements

Author would like to thank Carlos Villamar, Michel Gaultier, and Sarla Sharma for their assistance.

## About Chetan Sharma Consulting

Chetan Sharma Consulting is one of the most respected management consulting and strategic advisory firms in the mobile industry. We are focused on evolving trends, emerging challenges and opportunities, new business models and technology advances that will take our mobile communications industry to the next level. Our expertise is in developing innovation-driven product and IP strategy. Our clients range from small startups with disruptive ideas to multinational conglomerates looking for an edge. We help major brands formulate winning, profitable, and sustainable strategies.

The firm's intellectual property practice provides unique 360 degree advisory services. More information about the practice is available at <http://chetansharma.com/ip.htm>

Please visit us at [www.chetansharma.com](http://www.chetansharma.com)

## About the Author

Chetan Sharma is President of Chetan Sharma Consulting and is one of the leading strategists in the mobile industry. Executives from wireless companies around the world seek his accurate predictions, independent insights, and actionable recommendations. He has served as an advisor to senior executive management of several Fortune 100 companies in the wireless space and is probably the only industry strategist who has advised each of the top 6 global mobile data operators. He is considered a leading authority on the mobile data technologies and consumer trends. Some of his clients include NTT DoCoMo, Disney, KTF, China Mobile, Toyota, Comcast, Motorola, FedEx, Sony, Samsung, Alcatel Lucent, KDDI, Virgin Mobile, Sprint Nextel, Skype, AT&T Wireless, Reuters, Juniper, Qualcomm, Microsoft, Reliance Infocomm, SAP, Merrill Lynch, American Express, and Hewlett-Packard.

Chetan is the author or co-author of five best-selling books on wireless including *Mobile Advertising: Supercharge your brand in the exploding wireless market* and *Wireless Broadband: Conflict and Convergence*. He is also the editor of the *Mobile Future Forward Book Series*. His books have been adopted in several corporate training programs and university courses at NYU, Stanford, and Tokyo University. His research work is widely quoted in the industry. Chetan is interviewed frequently by leading international media publications such as *Time* magazine, *New York Times*, *Wall Street Journal*, *Business Week*, *Japan Media Review*, *Mobile Communications International*, and *GigaOM*, and has appeared on NPR, WBBN, and CNBC as a wireless data technology expert. He is also the chief curator of the mobile thought leadership executive forums – Mobile Future Forward and Mobile Breakfast Series.

Chetan is an advisor to CEOs and CTOs of some of the leading wireless technology companies on product strategy and Intellectual Property (IP) development, and serves on the advisory boards of several companies. He is also a sought after IP strategist and expert witness in the wireless industry and has worked on and testified in some of the most important cases in the industry such as Qualcomm vs. Broadcom, Samsung vs. Ericsson, Sprint vs. Verizon, Openwave vs. 724 Solutions, and Upaid vs. Satyam. Chetan is a senior member of IEEE, IEEE Communications Society, and IEEE Computers Society. He has Master of Science degree in Electrical Engineering from Kansas State University and Bachelor of Science degree from the Indian Institute of Technology, Roorkee.