

## **Back to the future: tracking patents to see where the path leads**

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*This article – originally published in IP Value 2006 – uses NASDAQ companies in the software/computing and biotechnology/pharmaceuticals sectors as examples to identify patenting characteristics and to track some trends in patenting behavior, which may indicate future directions for these companies.*

Protecting know-how is vital to the long-term survival and growth of an organization. The use of IP rights is key to maintaining this protection. Patents, in particular, establish specific areas of protection around a technology space and are used:

- to prevent others from using that technology outright;
- to secure revenue through licensing the use of that technology; or
- as strategic bargaining chips.

Looking at patents involves looking at the past – that is, at inventions developed some time ago. But, in fact, it also involves looking into the future. Patents are one of the few real indicators of future product releases, provided it can be established which patents relate to specific products.

However, there is a downside to building a patent collection – it leaves a trail that can be tracked by competitors. Still, what's good for the goose is good for the gander. It means that a company too can track its competitors' patents to see in which direction they are heading.

This chapter uses some National Association of Securities Dealers Automated Quotation (NASDAQ) companies in the software/computing and biotechnology/pharmaceuticals sectors as examples to identify patenting characteristics and to track some trends in patenting behaviour, which may indicate which way these companies are going in the future.

### **Software/computing sector**

Three of the main NASDAQ companies in this sector are Amazon, Dell and Microsoft. Although patents have traditionally been used to secure rights over tangible technical developments such as computer hardware, both software and business method patents are now increasingly accepted and employed to protect innovation in these areas. Therefore, it is no surprise to find that these companies hold significant patent portfolios in both hardware and software technologies to underpin their investment in these activities.

### **Fundamentals**

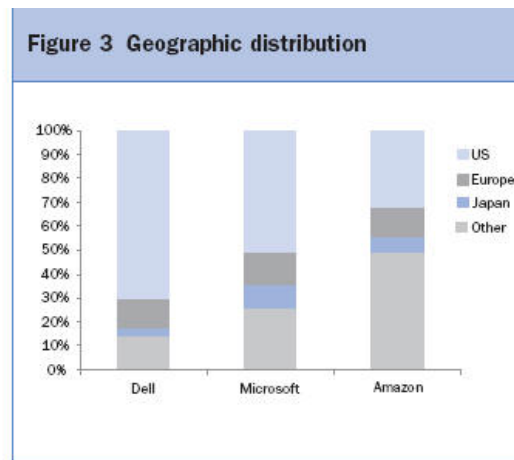
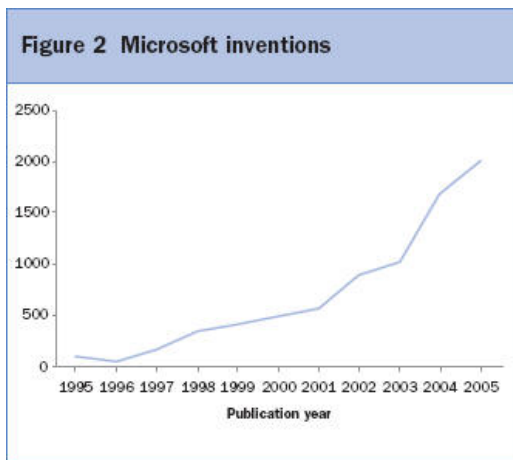
To gain an understanding of the relative sizes of these organizations, it is useful to compare some fundamental measures (see Figure 1).

**Figure 1**

Company	Employees 2004	Revenues (2004 US\$ billion)	R&D spend (2004 US\$ billion)	Total patents 2001-2005
Dell	61,000	41.400	0.460	798
Microsoft	57,000	36.840	7.770	6110
Amazon	9000	6.920	0.250	50

Although similar in employee numbers and annual revenue, it is clear that Microsoft, with eight times as many patents as Dell for the same time period, is by far the most active in patenting its inventions. This emphasis on research is also shown in the heavier Microsoft research and development spend, which is more than 16 times that of Dell. With the smallest patent portfolio, Amazon is also the least efficient at converting research and development spend into intellectual property, at US\$5 million per patent (Dell being the most efficient, spending US\$576,000 per patent, and Microsoft spending US\$1.27 million per patent). However, Amazon is the most successful at converting intellectual property to revenue at US\$180 million worth of sales per patent (Dell receives US\$76 million and Microsoft just US\$9.3 million).

It is interesting to note that Microsoft's investment in innovation is a relatively recent trend, with just under 50 per cent of all Microsoft patents being published within the last two years (see Figure 2).



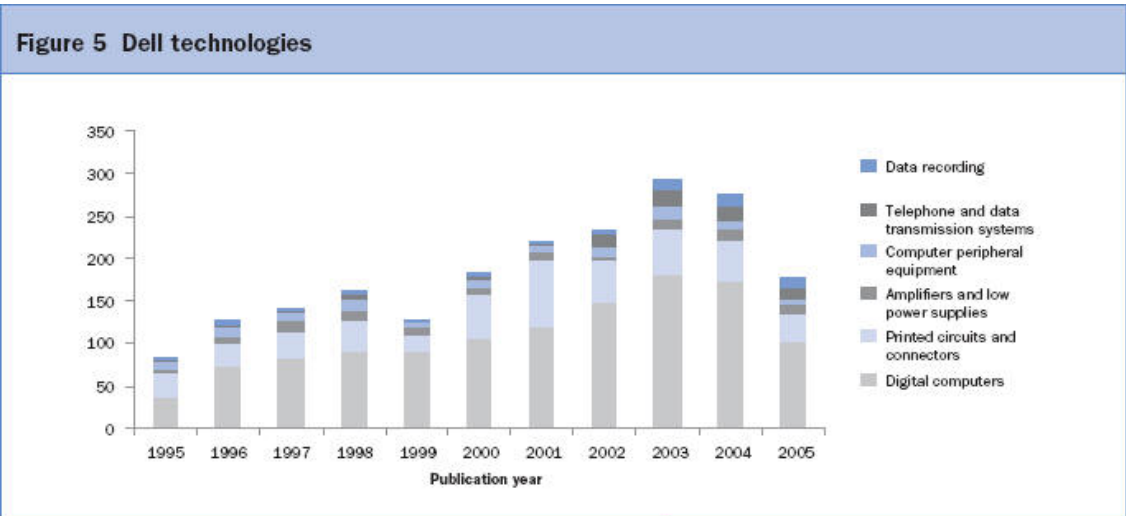
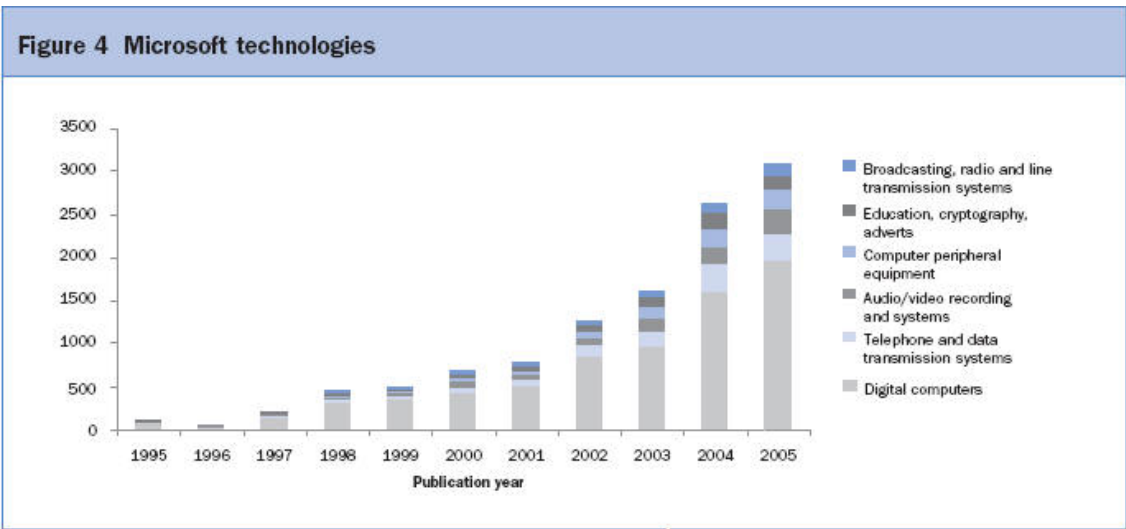
**Geographic distribution**

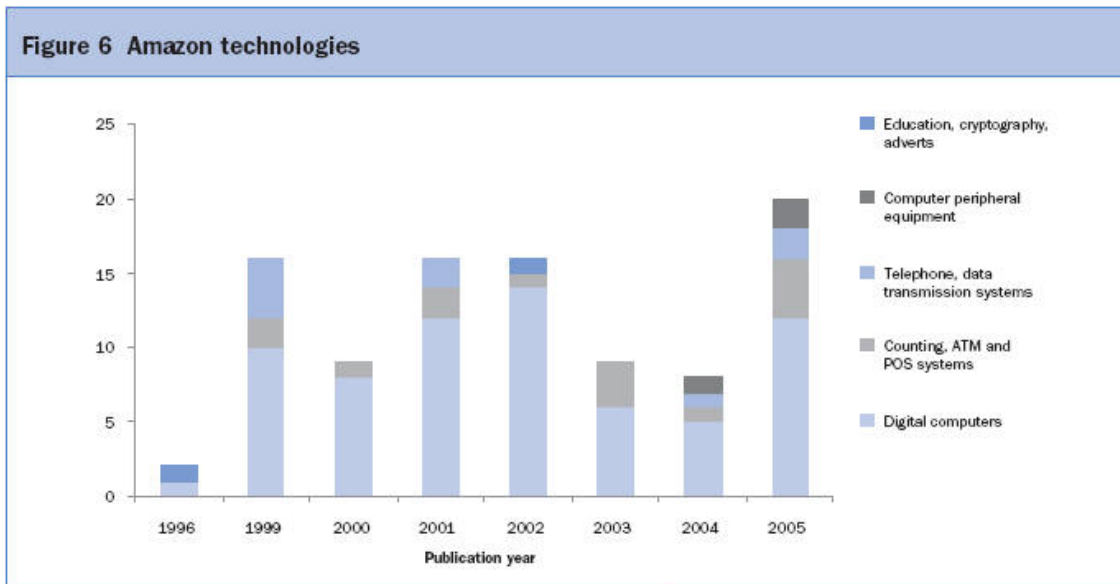
Although the markets for all three companies are global, Microsoft and, particularly, Dell focus more on filing for protection of innovation in their domestic market compared to Amazon, which has a significantly higher proportion of filings in Europe, Japan and elsewhere (see Figure 3).

**Technology distribution**

While Dell may be expected to, Microsoft also owns substantial recent holdings in digital computer patents. Among these are patents to a handwriting recognition system, an antenna device for use with a computer and a broadcast signal reception method for television. These examples may be taken as potential indicators of Microsoft's broadening multimedia and hardware interests beyond operating systems and application software.

Amazon holds patents in digital computers and asynchronous transfer mode, point of sale and data transmission systems (see Figures 4 (Microsoft), 5 (Dell) and 6 (Amazon)).





**Biotechnology/pharmaceuticals sector**

Four principal NASDAQ companies in this technology sector are Amgen, Chiron, Nanogen and Teva. Together they represent the transition from traditional to modern approaches in clinical disease treatment – compare Teva’s 100-year history to the combined lifespan of just 61 years for the other three companies.

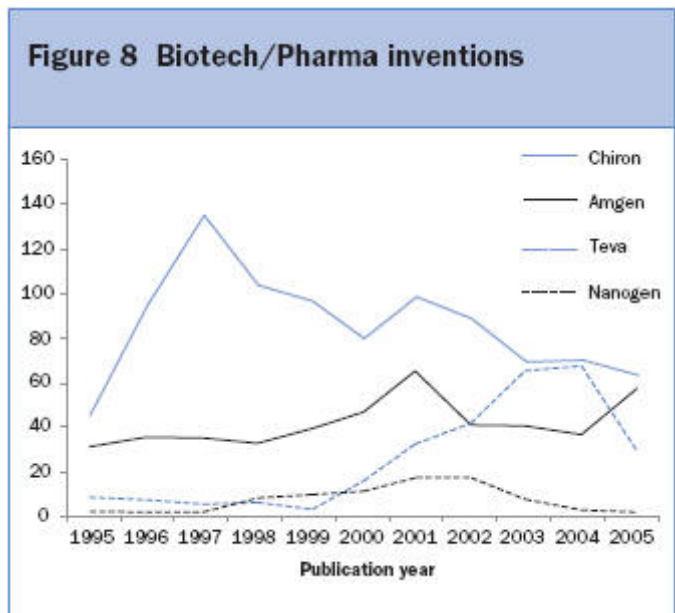
**Fundamentals**

Although Amgen and Teva employ approximately the same number of people and have held the same number of patents over the last five years, they differ significantly in revenues and investment in research and development. Chiron is smaller but holds the most patents. Nanogen, the youngest of these companies, holds the smallest number of patents (see Figure 7).

**Figure 7**

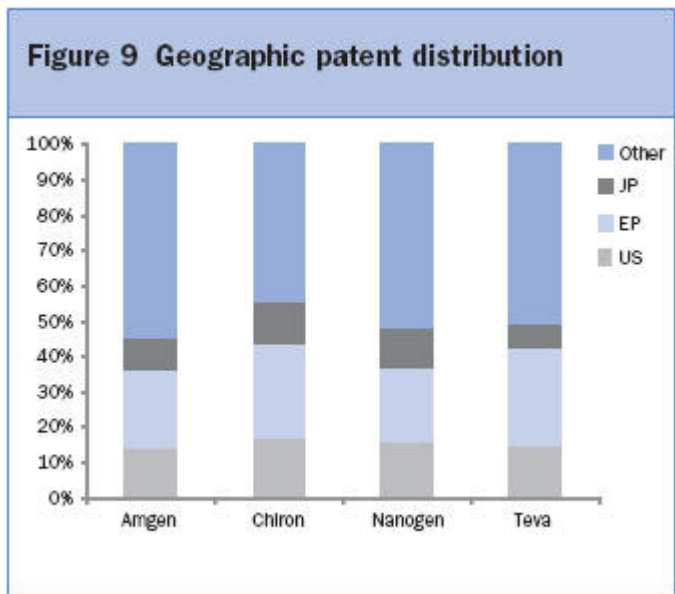
Company	Employees 2004	Revenues (2004 US\$ billion)	R&D spend (2004 US\$ billion)	Total patents 2001-2005
Amgen	14,000	10.600	2.000	240
Teva	14,000	4.800	0.356	240
Chiron	5,400	1.720	0.430	393
Nanogen	n/a	0.005	0.018	47

In recent years Teva, which is best known as a generics manufacturer, has increased its reliance on patents to protect its inventions (see Figure 8).



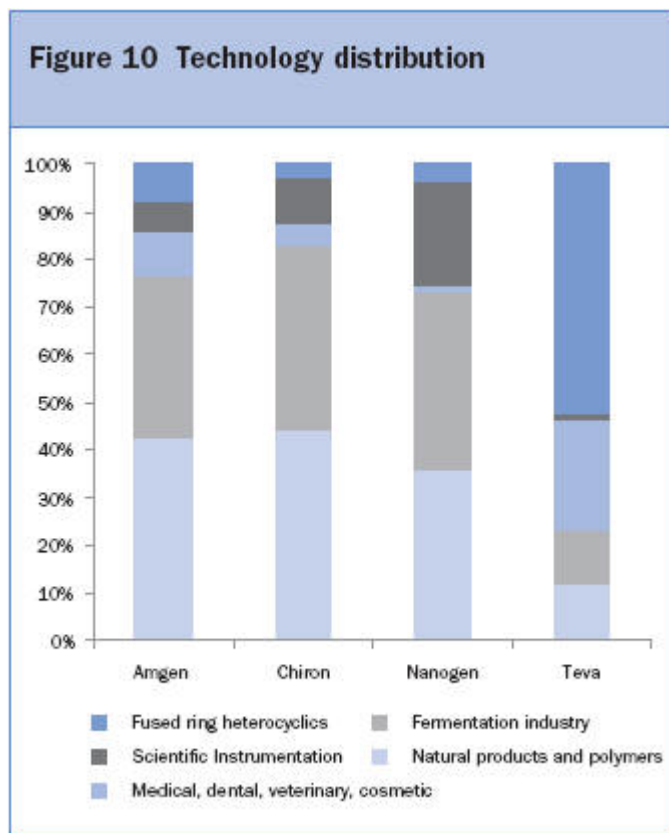
### Geographic distribution

Geographically, all four companies exhibit similar patenting profiles (see Figure 9).



### Technology distribution

In terms of technology, there is a clear divide between the biotechnology companies with an emphasis on natural products and fermentation technology, and Teva, a more classically chemical-based pharmaceutical company, with an emphasis on heterocyclic compounds (see Figure 10).



### Spotting the winners

As stated before, patents are one of the few real indicators of future product releases, provided it can be established which patents relate to specific products. It is likely that any important future development will be:

- protected with granted patents;
- protected widely across many different regional areas; and
- widely cited by later published patents.

Using these indicators, it is worthwhile looking at several Amazon inventions to see whether any potential winners can be spotted.

The most famous Amazon patent is the 'one-click' patent (US5960411, granted on September 28 1999). This has been through patent applications in seven countries, at the European Patent Office and under the Patent Cooperation Treaty, has two patents granted on it in the United States and the European Patent Office, and has been cited by 198 later published patents.

Using this as a yardstick, other potentially important inventions may be examined.

An Amazon application published on May 17 2001 covers online advertising and relates to "a method for allocating display space on web pages indicating bid amounts and advertisement". Originally published as WO200135291-A2 on May 17 2001, it has no granted patents to date, has

no supporting patents and has been cited only once by a later published patent (NEC). Therefore, this invention is unlikely to be widely commercialized.

A later published Amazon patent concerning an “electronic discussion-initiating method for electronic commercial transactions”, published on February 25 2003, has a granted US patent (US6525747-B1), and is cited by six later patents (three by America Online, one by Microsoft, one by Apple and one by 4-D Networks). This may indicate some future potential for this technology.

Whatever techniques are used, it is clear that patents are a valuable asset, not only in protecting an organization’s know-how, but in tracking technical development and assessing the risks and opportunities in developing market spaces such as those occupied by the NASDAQ companies considered here.

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