



2010 Technology Industry Perspective

As we approach 2010, we thought it would be useful to reflect on 2009 and to offer our perspective on the major dynamics we foresee in the technology sector for the coming year. As we predicted in last year's letter, the economic downturn that began in earnest in the fall of 2008 did indeed deepen, and its effects were felt throughout the technology sector – a universe that includes semiconductors, consumer electronics, software, computing, and network infrastructure. Spending by consumers and corporations alike was down significantly, with predictably unfortunate results. For the first time in its history, for instance, Microsoft saw a decline in its revenues during its 2009 fiscal year. Cost cutting on the part of enterprise technology companies is becoming a way of life, as already has happened for enterprise IT customers. The overall contraction is punctuated by this year's 11 percent fall in sales of semiconductors, the most fundamental building block of the high-tech industry.

Yet there were also some bright spots in 2009. Second-quarter sales of netbooks were up 40 percent over the previous quarter, representing a 22 percent share of the entire PC market. And Apple's revenues and earnings remained strong, as consumers continued to find the Apple "ecosystem" an appealing choice. Shares of VMware, a maker of virtualization software, have more than doubled since hitting a low in December 2008, suggesting continued interest in virtualization on the part of corporate IT departments. The digitization of everyday tasks continues apace, with the rapid growth of electronic reading on Amazon's Kindle and Sony's Reader.

These bright spots confirm the relevance of the trends we believe will help to redefine the technology sector in the coming year – including further consolidation in the sector, the continuing growth of cloud computing, the further consumerization of technology, the acceleration of open innovation, and the growing power of emerging markets. Although these trends will take years to reach their fullest expression, both sellers and buyers of technology would be wise to begin paying attention to them now.

Consolidation

The recession certainly didn't slow down M&A activity in the technology sector in 2009. Hardware companies bought software and services companies, software companies bought hardware companies, a private equity firm bought Skype, Hewlett-Packard bought telecom equipment maker 3Com, and Cisco continues to buy strategically to strengthen its product portfolio – including video equipment maker Tandberg and a Chinese maker of set-top boxes. The high-tech sector worldwide made 365 deals, worth US\$27.2 billion, in September 2009 – the highest total since December 2007.

What is driving the consolidation trend? Certainly the downturn has helped, at least in the short term, by lowering the valuations of many target companies. That has opened a window of M&A opportunity that may close soon, as the economy turns back to growth and all the current activity drives valuations higher.

In the long term, we see two major structural forces that will continue to drive tech M&A. The first is the determination on the part of many of the larger players to increase, as quickly as possible, both the scale and scope of their business. Deals such as those between Oracle and Sun Microsystems, Hewlett-Packard and EDS, and Dell and Perot Systems are clearly part of this strategy: Each of the buyers is looking to become a one-stop shop for large-scale corporate IT buyers. The second is the rapid shift toward services as a mainstay offering, thanks to the increasing commoditization of hardware and the annuity stability provided by services. We expect more such deals in the near future, but we also think prices will escalate as the economy improves and buyers chase a declining number of desirable assets.

The Cloud

Consumers are already familiar with a wide variety of cloud-based services, including such offerings as Google's many Internet-based applications for personal productivity. Now, cloud computing is also becoming a more common choice among corporate IT users. So far, it is mostly smaller companies that are turning to "public" clouds, run by companies such as Amazon, Google, and Microsoft, to gain flexibility and cost variability in their purchase of computing power. Larger companies have so far preferred to build internal, "private" clouds, which offer the benefit of flexibility without the ongoing security concerns.

Yet those concerns, we believe, are overblown. The real hurdle for cloud computing among large companies has really been a corporate IT culture that

is ever wary of housing strategic data outside their firewalls, and their control. That will likely change as the cost and agility benefits of cloud computing become a strategic differentiator. Large companies are already reaping real savings gains from cloud services such as software-as-a-service offerings and others. Indeed, thanks to the flexibility of the cloud, one large technology company plans to stop providing personal computers and smartphones to its employees; instead, it will just provide employees with a set of standards and let them choose the personal devices they favor that also meet those standards. The net result: an expected 30 percent reduction in the company's total IT spend.

Indeed, the rise of cloud computing will bring with it major changes in how workers work, and ultimately in the nature of the devices they use to do that work. The popularity of smartphones and netbooks, whose power and usefulness derive in great part from their connection to the many services offered over the Internet, suggests that the glory days of client-server computing are slipping away, and that the end-use form factors will fragment into a wider range of options dictated by consumers.

Consumerization

As the power and mobility of devices of all kinds increase, and consumer-oriented services such as social networking and app stores grow in popularity, consumers are becoming the new kings of the tech world – a world traditionally led by the needs of enterprises. Customization – the ability to personalize virtually every kind of device and service, from the phone to the Facebook page – has become key to success in consumer electronics, and no product, it seems, can succeed now without its own online store stocked with thousands of apps. It's fair to say that Apple originated this trend, as well as the strategy of building a complete "ecosystem" of products that work together seamlessly, and the company's continued strong results are proof of the strategy's continuing viability. Others, like Google, are trying to develop their own device "ecosystems"; whether they prove as successful as Apple remains to be seen, but we expect quite a splash from open players like Android.

Equally important is the degree to which the consumerization trend is beginning to affect corporate computing. The percentage of employees who grew up with the Internet is growing rapidly, and these workers have come to expect the same degrees of device choice, flexibility personalization, and collaboration in the office that they have at home. The rise of cloud computing is both a cause and a symptom of this trend – like the big technology company mentioned above, corporations are changing their IT

strategies and investment patterns to support users' demands for anytime, anywhere availability.

Open Innovation

For decades, the flow of technology innovation began with the enterprise and moved out to consumers. Now, however, as the center of power in the technology sector shifts toward consumers, so too will the heart of innovation. Consider the burst of innovation that followed the release of the iPhone: In less than two years, Apple's app store went from zero to more than 100,000 apps and now generates over \$200 million per month in sales. As noted, others are busily copying Apple's success. Within weeks of its release in October, the Google/Motorola Droid phone already had upwards of 15,000 apps. And China Mobile, which serves 500 million customers, is coming up with its own version of Android.

This pattern of innovation, we believe, will only intensify – for several reasons. Despite the success Apple has achieved with its closed, proprietary systems, the long-term trend is clearly toward openness – open source, open standards, open operating systems, open interoperability. Consumers and business users alike are increasingly demanding it, and companies are responding. Furthermore, open innovation can be much cheaper to conduct. Why incur the high costs of R&D if you can get others to perform the work for free?

At the same time, it would be dangerous to underestimate the potential disruptiveness of this trend. Three years ago, dedicated GPS navigation devices looked to be a sure bet, and shares of companies such as Garmin and TomTom were flying high. But the introduction of GPS apps on smartphones has changed the market dramatically, and shares in Garmin, for instance, have tumbled 75 percent. Other segments are likely to go down this same path.

Emerging Markets

Even as tech sector growth remains sluggish in developed markets, we expect much of the sector's action to move east and south to developing markets, especially the BRIC countries (Brazil, Russia, India, and China). Most of the future growth in the PC market will occur in these markets – indeed, in the BRIC countries alone, the number of PC users is expected to increase more than 30 percent annually, to more than 500 million by 2012. And local vendors, which already control as much as 30 percent of these markets, will likely take the lead, especially in ultra-low-cost PCs and netbooks.

Meanwhile, more and more sourcing activities are moving to the developing world: India and China have already captured large portions of this activity, and other countries are beginning to catch up.

As this trend escalates, developing markets will become increasingly sophisticated. Local companies will move up the value chain, from manufacturing to design to innovation, at very low cost – a process that will mean significant disruptions to traditional supply chains. Ultimately, these firms will begin to go well beyond manufacturing goods for other companies to brand, and create their own brands at highly competitive price points.

Indeed, some already have. The success of the Chinese shan zhai companies, which derive their growth from rapid, disrupting – and sometimes pirated – innovation, is a symptom of this trend. The best of them – including PC maker Acer, flat-panel TV manufacturer Visio, and Huawei, now the second-largest mobile telecom equipment maker in the world behind Ericsson – have succeeded in transforming the dynamics of a number of markets in China and, increasingly, overseas. Other companies, such as Tianyu, Orange, Anycat, and Nokir, all makers of mobile handsets, could follow the same path. It remains to be seen whether companies in the developed world will be able to compete, given the downward pressure these new players will place on already thin margins.

Is there a common thread to the five trends we have identified here? We believe we are seeing the rapid maturing of the technology sector. The sector may never again experience the very rapid growth of its early years. Instead, it is now benefiting from the sheer ubiquity of technology – the degree to which it has become part of our everyday lives, as both consumers and business users. There is still growth to be found in select sectors of an overall mature market, if companies are smart enough to understand how to benefit from this rapidly changing marketplace.

We hope this letter has prompted some helpful thoughts on the coming challenges. We would welcome the opportunity to discuss these issues with you in greater detail.

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