The Economist

IBM

1100100 and counting

The secret of Big Blue's longevity has less to do with machines or software than with strong customer relationships

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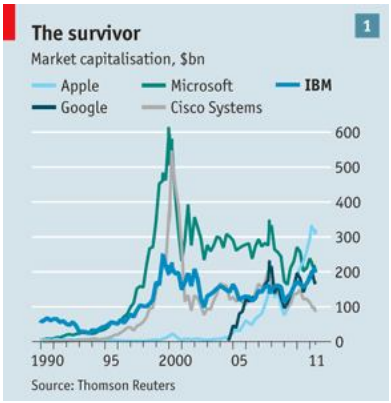
THE long passage that connects the two wings of IBM's headquarters in Armonk gives a new meaning to the expression "a walk down memory lane". From punch cards to magnetic tapes and disk drives to memory chips, every means of storing information since the advent of modern calculating machines is on display, either as an exhibit or as a photo. Other relics of computing can be found in the building, an hour's drive north of New York City. Near the boardroom sits a desk-sized calculator with hundreds of knobs. Visitors can also wonder about a tangle of wires connected to a metal plate—an early form of software called a "control panel".



No other information technology (IT) company could boast such a collection and also claim to have built each of the items on display. The history of computing cannot be conceived without IBM, which celebrates its 100th birthday on June 16th. Remarkably, even though to many minds Big Blue, like the objects on show at Armonk, is a relic of the 20th century, the firm remains one of the IT industry's leaders. Its market capitalisation again almost matches that of Microsoft, its archrival for many years (see chart 1).

The firm's centenary is an occasion to reflect on many things digital, but one question stands out: why is IBM still alive and thriving after so long, in an industry characterised perhaps more than any other by innovation and change? This is not just of interest to business historians. As IBM enters its second century in good health, far younger IT giants, such as Cisco Systems, Intel, Microsoft and Nokia, are grappling with market shifts that threaten to make them much less relevant.

To grasp why it is so difficult for IT firms to stay on top, picture the computer industry as a never-ending enterprise to create digital "platforms", both large and small. These are the foundations on which others build software applications or services. Every ten years or so, a new dominant platform emerges to elevate computing to another level. First came mainframes. This was followed by "distributed" systems: mini-computers, personal computers (PCs) and servers. And now there are computing "clouds" and mobile devices.

Migrating from one platform to the next, explains Michael Cusumano, a business professor at the Massachusetts Institute of Technology, means questioning everything a firm stands for: the technical skills, the brand, how money is made. So big companies mostly try to defend their existing domains rather than to explore and conquer new ones. Microsoft, for instance, remains firmly attached to its Windows operating system (see article). Only a few have managed even one

platform shift, let alone, like IBM, pulled off three. And either of its first two could have easily done Big Blue in.

Or should that be 1111101?

Official history notwithstanding, the company's true age is 125. In 1886 Herman Hollerith, a statistician, started a business to rent out the tabulating machines he had originally invented for America's census. Taking a page from train conductors, who then punched holes in tickets to denote passengers' observable traits (eg, that they were tall, or female) to prevent fraud, he developed a punch card that held a person's data and an electric contraption to read it. The technology became the core of IBM's business when it was incorporated as Computing Tabulating Recording Company (CTR) in 1911 after Hollerith's firm merged with three others.

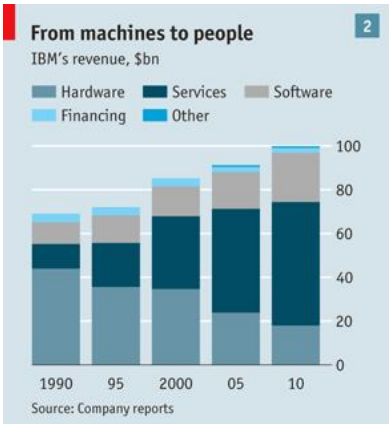
The first platform shift became necessary when electronic "calculating machines" and magnetic tapes came along in the late 1940s. IBM's management, including Thomas Watson senior, who took the helm at CTR in 1915 when it had 400 employees and built it into a global force with tens of thousands, was hesitant. "You young folks remember, IBM was built on punch cards, and our foundation will always be punch cards," a veteran IBMer is reported to have said to one of the developers of the first tape-drive. Some say that it was only because Thomas Watson junior, who took over from his father in 1956, had made the new technology his cause that IBM fully embraced the electronic age.

Under the younger Watson, IBM became by far the world's biggest computer-maker. He did the trick by betting the company on the System/360, IBM's first family of mainframe computers, which took years and $5 billion (in 1960s dollars)—more than the Manhattan Project that led to the atomic bomb—to develop. Launched in 1964, the System/360 became the first dominant computing platform, mainly because all the family's machines, big or small, were "compatible", meaning they could run the same software.

By 1969 IBM's market share had grown to 70%. It thus became the first IT company to be called an "evil empire" and aroused the ire of America's antitrust authorities. The Reagan administration eventually dropped the case in 1982, asserting that it had been "without merit".

The second platform shift—from costly mainframes to "distributed" computing systems, including PCs—was a much closer shave. Even while the antitrust case was dragging on, technological progress had begun to undermine IBM's near-monopoly and, more importantly, its business model of renting its expensive machines to customers. Since this was highly profitable, IBM was very slow to deliver cheaper and distributed computing systems, made possible by new processors. When these systems took off in the early 1990s, IBM's business collapsed. Mainframe revenues dropped from $13 billion in 1990 to $7 billion in 1993 and losses of $16 billion piled up. "Only a handful of people understand how precariously close IBM came to running out of cash," wrote Lou Gerstner, who was brought in to turn the company around, in "Who Says Elephants Can't Dance?", his book about the revival. He fired 35,000 employees to cut costs.

Compared with that, the third (and continuing) platform shift is a doddle (see chart 2). IBM spotted sooner than many competitors that computing would increasingly become a service produced in vast data centres and delivered over networks, rather than something done on in-house desktops or mainframes. It also anticipated that such cloud computing would accelerate the emergence of "big data": huge piles of digital information that can be mined for valuable knowledge. Since 2005, for instance, IBM has spent $14 billion to buy two dozen firms offering all kinds of gear for "business analytics".



A big blue dancing elephant

So how has IBM done it? People who have been watching the company for a long time give similar answers. "From the beginning, IBM had a concept of itself as an institution, not just a technology company," says Rosabeth Moss Kanter, a professor at Harvard Business School and author of "SuperCorp", a book partially about IBM's prowess. "IBM is not a technology company, but a company solving business problems using technology," says George Colony, chief executive of Forrester Research, a consultancy.

This self-image was evident even in the older Watson's day. He renamed the company

International Business Machines (in 1924) because he found the original name too limiting. He also invested a lot in research and allowed his scientists to roam widely, not least in electronics. Drawing on his experience at National Cash Register, his previous employer and a pioneer in these matters, he quickly established a well-trained sales force and, later, a service organisation. Both not only helped customers make the best use of IBM's products, but gathered valuable information about customers' needs. By the late 1940s their message was crystal clear: firms wanted faster computing, which only electronic computers could deliver.

However, these feedback channels had become seriously clogged by the time distributed computing emerged in the 1980s. The huge success of its mainframes had made the company "internally focused", in the words of Irving Wladawsky-Berger, a retired IBM technologist. IBM's internal communications had broken down, too: the company had become a collection of national fiefs, each with its own way of doing business and independent management. The firm had also diversified in all directions, including helicopter avionics and consumer online services.

Mr Gerstner—who joined IBM from RJR Nabisco, a food and tobacco conglomerate, and admitted to not knowing much about IT—managed to turn things around mainly because he was able to put IBM's old DNA to a new purpose. His bet was that in the confusing world of distributed computing, with its many moving parts, firms would need not only the right tool but also trusted advisers. So he turned IBM's service organisation, hitherto a sub-unit of the salesforce, and its software business, until then part of the hardware division, into standalone businesses. Thus the old IBM, which sold integrated mainframes, gave way to a new one. Its raison d'être is to help customers manage their electronic jungles, explains Steve Mills, head of IBM's software business, which has sales of $22.5 billion. That is only a few billion less than Oracle, the world's second-biggest software firm (the biggest is Microsoft).

Mr Gerstner and Sam Palmisano, who succeeded him in 2002, also took less visible measures to avert another brush with oblivion. The first aim was to maintain IBM's connections to its customers. Today the main conduit is the huge services organisation, which employs more than half the total workforce of nearly 427,000. It often "co-creates" products with customers, says Bridget van Kralingen, the firm's general manager for North America. With the state of New York, for instance, IBM developed a method of detecting tax evasion, which it claims has saved taxpayers $1.6 billion since 2004.

Where the big data are

Second, IBM has become much less hierarchical and more open. Its Smarter Planet initiative (which is intended to inject more intelligence into, say, power grids and transport systems) is said to have originated in one of IBM's "jams", online brainstorming sessions where all employees and sometimes even family members are welcome. And whereas the old IBM made, sold and jealously guarded its own technology, the new one champions open standards and open-source software. This makes life easier for its services unit.

Third, IBM tries to ensure that the output of its 3,000-strong research division remains relevant to its business. Researchers are regularly embedded with teams from the services unit to give them on-the-ground experience. Sometimes they co-operate with customers, for example in creating a system that constantly monitors the vital signs of newborn babies to indicate when they acquire an infection. They are also prodded to look ahead, explains Robert Morris, who helps devise the firm's research strategy. Once a year, they must produce a "Global Technology Outlook", an attempt to spot important trends early.

Fourth, IBM is no longer a collection of independent national subsidiaries, but a globally integrated company. It has a common IT infrastructure, which allows it to use the same accounting, procurement and other business processes all over the world. Code developed by services teams is shared too: whenever they start a new project, one of their first steps is to log on to a service called AssetHub, a global repository for software building-blocks. Staff are trained to work in global and often virtual teams. In one programme, Corporate Service Corps, every year about 500 staff volunteer to spend a few weeks in small groups in developing countries working on specific problems, such as advising the city of Rio de Janeiro how best to fulfil its pledge to use sustainable technologies for the 2016 Olympic games.

The last bit of insurance against disaster is financial planning. One rule is to ditch businesses that are about to become commoditised and no longer yield a sufficient profit margin. This is why IBM has since 1999 sold half a dozen businesses, including PCs and printers. It is also why in 2002 it bought the consulting arm of PricewaterhouseCoopers, an accounting firm, and is constantly trying to push its services business into higher-value territory and even created something called "services science" to study ways to automate them.

IBM has a financial "roadmap" telling investors how profitable it intends to be in the next five years and how it will get there. By 2015 the firm wants its earnings per share almost to double, to "at least" $20. The roadmap also helps, according to Mark Loughridge, the chief financial officer, "to keep the same level of intensity" as during the near-death experience of the early 1990s. "If you ask executives about the roadmap 2015, they can tell you immediately how their plans are lined up to that longer-term goal," he says.

When I'm 64 (in hexadecimal)

IBM, 100 years after its incorporation, appears to be fairly well in control of its destiny. Yet its history can be read as the result of business constraints as much as of managerial genius. From the beginning, as a maker of complex machines IBM had no choice but to explain its products to its customers and thus to develop a strong understanding of their business requirements. From that followed close relationships between customers and supplier.

Over time these relationships became IBM's most important platform—and the main reason for its longevity. Customers were happy to buy electric "calculating machines", as Thomas Watson senior insisted on calling them, from the same firm that had sold them their electromechanical predecessors. They hoped that their trusted supplier would survive in the early 1990s. And they are now willing to let IBM's services division tell them how to organise their businesses better.

The human platform has an important drawback: it is expensive to maintain and to extend, says Carl Claunch of Gartner, a market-research firm. That also means, however, that it is costly for others to replicate or invade. And given the complexity of the world and how much of it is still to be digitised, IBM's human platform looks unlikely to reach its limits soon. Perhaps not for another 100 years.

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