

Remote takeover: How RealVNC conquered the world



First released in 1998, RealVNC's remote access and control software is today used in more than a billion devices. After winning the UK's main award for innovation in engineering, CEO and founder Andy Harter explains how it became one of the most successful Cambridge University spin-outs of all time.

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Andy Harter

The idea was simple, but it promised to revolutionise the telecommunications industry forever. Instead of just calling people on your mobile phone, the device would also become a miniature, wireless computer. Using an innovative touchscreen design, users would be able to buy and download programs via an online store. The “broadband phone”, as researchers speculatively dubbed it, would put the power of a PC into the owner's pocket, enabling them to take photos, make films, play games, listen to music, and surf the web.

This, though, was 1999 - and the place was not an Apple research lab, but Cambridge, UK. “We knew that the phones of the future would need to do a lot more than just make calls,” Andy Harter, responsible for the broadband phone project, remembers. “Around 2000, we demonstrated it at the famous Sun Valley summer camp for industry moguls. The room was packed with technology luminaries and CEOs. I'm pretty certain that Bill Gates and Steve Jobs were there.”

Seven or eight years before Apple unveiled the iPhone, not everyone really got the point of this idea. Mobile companies, not to mention their customers, simply weren't ready for the type of phone that was being proposed. Expense was a problem, wireless broadband was not commonplace, and there were some technical obstacles to resolve. "There is a saying in the investment community that being too early is a good as being wrong," Harter says. "but the concepts we mapped out have undoubtedly lived on."

Plans for the broadband phone were reluctantly shelved, but the technology that Harter had hoped might enable users to access programs through their mobile was already starting to flourish. In fact, the phone was just one of a wide range of possible uses that were being mooted around that time for his Virtual Network Computing (VNC) system.

It would be churlish, to say the least, were Harter or anyone else at RealVNC - the company which he co-founded in 2002 to exploit the technology, and of which he is CEO - to look back on such abortive opportunities with regret. The broadband phone might have been ahead of its time, but demand for VNC has been rising since day one. The software essentially allows a computer screen to be accessed remotely and controlled from another device. Invented for a purpose far more specific than the array of functions it now fulfils ("let your desktop follow you around" was an early proto-slogan), VNC is now so ubiquitous that it is an official part of the Internet, alongside web and email protocols. "At our best guess, it is being used in more than a billion devices," Harter says.

Earlier this year, RealVNC won its third Queen's Award for Enterprise in as many years. These awards are the most prestigious accolades for business in the UK. To win three is unusual - but holding three at once (each expires after five years) is rare indeed. This month, the company was also honoured with the MacRobert Award - the UK's premier award for innovation in engineering.

This makes RealVNC one of the most successful companies in Cambridge's technology cluster (the so-called "Silicon Fen"), and one of the biggest success stories among tech spin-outs with origins at the University. Today, RealVNC still has many informal links with the University of Cambridge, and it is clear that without it - and in particular without its Computer Laboratory - the business would never have existed.

Harter himself went to Cambridge in 1980, and would have been an organ scholar, only back then Colleges required organists to take music as a degree. "It was one of those crossroads in life, music or maths," he reflects. "It took me about two seconds to choose maths." A self-confessed computing nut who had taught himself how to build and program computers while still at school, he had his sights firmly set on further study in that field. "I wanted to come to Cambridge, because, even though it was the early days of Silicon Fen, I knew that there was an industry based around the Computer Laboratory. That was where I wanted to end up working." In his first summer, he got a job at Acorn under the stewardship of Hermann Hauser and Andy Hopper, both pioneering figures in the cluster's history. Hopper, who is now Director of the Computer Lab, would later become his PhD supervisor and a co-founder of RealVNC.

In 1986, the enterprise culture that Harter had perceived in and around the University's Computer Lab was significantly enriched by the establishment of a Cambridge Research Lab owned by Olivetti. Carrying out projects on behalf of the Italian PC manufacturer, but free to select its own priorities, it was essentially a bridge between academia and industry. Any innovations that might prove worthy of commercial exploitation, particularly those which disrupted established technologies, were given a customised business model to help them to flourish.

In its lifetime, the Olivetti Research Lab (ORL) sponsored dozens of Cambridge computing students, and published more than 100 technical papers in partnership with members of the University. Harter was one of the graduates who helped to establish ORL in the early days, and it was there that he first started to develop VNC. "The Lab was very much on the edge of the University, and really it was a

very happy and mutually beneficial collaboration,” he recalls. “The culture was one of building things on a reasonable scale and in a usable way. Our innovations were rooted in solving real problems, or fulfilling an unarticulated need.”

VNC clearly made the grade. By allowing one computer to access the screen of another, it offered the prospect of enabling IT teams in particular to provide users with remote technical support, troubleshooting problems from their own terminal, rather than having to visit the computer with the problem. To this day, helpdesk support remains VNC’s primary function and goes some distance to explaining why it is now so ubiquitous.

In 1998, however, Harter made what seems like a surprising move, releasing VNC as non-commercial, open-source software online. “It was the early days of open-source and search engines were not as omnipresent and omnipotent as they are now,” he says. “We really weren’t sure who would find it or what the effect would be. So it was amazing watching on day one, seeing about 100 people finding it all over the world. By the end of the first week, that had risen to a few thousand. It became viral.”

The numbers never stopped going up. Despite the unconventionality of the approach, starting VNC as an open-source venture successfully created a market for the commercial-grade versions which then followed. By the time RealVNC was founded, in 2002, there were already 100 million people using the product, many of whom were, as a result, interested in the company-wide support Harter’s firm was now offering.

The business model has diversified since, but direct sales remain a major part of it. A typical customer nowadays might be a relatively small IT team of about a dozen people managing a thousand computers on behalf of a firm. At the same time, the software is licensed out to the likes of the semiconductor chip manufacturing giant Intel, who pay royalties to RealVNC in return. And, while technical support remains VNC’s foremost application, its capacity to drive information-sharing between devices has led to uptake in sectors such as education, engineering and design. Even in healthcare, VNC now appears in MRI scanners and X-Ray machines. When they break down, technicians are often able to fix the problem remotely, rather than leaving patients and staff waiting while someone is sent to the hospital.

VNC’s open-source origins clearly help to explain its success. By releasing the software in this way, Harter and his colleagues were able to make millions of people from different walks of life aware of the product, and from that sprang a multitude of uses far beyond the original concept of a portable desktop within a single office. Harter also believes, however, that the global spread of the software was a result of the fact that it is “beguilingly simple - so simple that it’s almost profound.”

VNC works by replicating screens at the level of individual pixels, compressing these, and enabling them to be decoded by a second machine. By making the formula no more complex than that, the company’s product has become universal across a whole range of platforms, including those which did not even exist when it was first released in 1998. It is for this reason, for example, that it was possible to use VNC in a prototype “broadband phone” back at the turn of the 21st century, or in tablet computers once they appeared.

“We’ve always said that we don’t care what kind of computer is at either end, we have to make it work,” Harter adds. “In the end, that made VNC so universally adaptable that it anticipated devices that didn’t exist yet, and ones that are yet to come.” As a result, while RealVNC is in many ways a company exploiting the same product over and over again, opportunities for new applications are constantly appearing on the horizon.

At its Hills Road premises in Cambridge, the company employs about 100 people - an astonishingly small number when one considers the many, many millions now using the technology. A lot of effort is spent testing and checking the software on different platforms, to ensure that by enabling one machine

to access another, VNC does not pose a security risk. The vast majority of the company's work is, however, in research and development, focusing on future applications.

Harter is particularly interested in the prospect of a so-called "Internet Of Things" - the likelihood that, in the future, products and consumer appliances as diverse as washing machines, lighting, electric fans, cars, and television sets will be able to talk to each other in the same way that computers and smartphones can link up now.

This is new and fertile territory for his product. If, for example, you have ever arrived at work only to find yourself worrying about whether you locked the door, or switched on the dishwasher, it might be possible in the future to check and - if necessary - resolve the problem via a VNC-enabled desktop computer, laptop or phone. Similarly, manufacturers may soon be able to check and fix broken household appliances remotely, potentially putting an end to infuriating afternoons, sitting at home, waiting for a technician to arrive at an unspecified time somewhere between the hours of 12 and 6.

Just like the 1999 broadband phone, not all of the prototypes Harter's staff are currently working on will necessarily see the light of day. What matters to Harter, however, is that the founding principles underpinning the original software have ensured that the company has time to explore such avenues fully. "There is an element of serendipity in what we have achieved, an element of bloody-mindedness, and an element of being just plain right," he concludes. "If you grow organically, though, as we have, then you can afford to allow yourself a bit of long-termism, and develop a broader agenda. The result is that we are never simply about carrying on with things as they are. We've got plans."

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