How the internet killed the phone business

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Almost-free internet phone calls herald the slow death of traditional telephony

THE term “disruptive technology” is popular, but is widely misused. It refers not simply to a clever new technology, but to one that undermines an existing technology—and which therefore makes life very difficult for the many businesses which depend on the existing way of doing things. Twenty years ago, the personal computer was a classic example. It swept aside an older mainframe-based style of computing, and eventually brought IBM, one of the world's mightiest firms at the time, to its knees. This week has been a coming-out party of sorts for another disruptive technology, “voice over internet protocol” (VOIP), which promises to be even more disruptive, and of even greater benefit to consumers, than personal computers (see article).

VOIP's leading proponent is Skype, a small firm whose software allows people to make free calls to other Skype users over the internet, and very cheap calls to traditional telephones—all of which spells trouble for incumbent telecoms operators. On September 12th, eBay, the leading online auction-house, announced that it was buying Skype for $2.6 billion, plus an additional $1.5 billion if Skype hits certain performance targets in coming years.

This seems a vast sum to pay for a company that has only $60m in revenues and has yet to turn a profit. Yet eBay was not the only company interested in buying Skype. Microsoft, Yahoo!, News Corporation and Google were all said to have also considered the idea. Perhaps eBay, rather like some over-excited bidder in one of its own auctions, has paid too much. The company says it plans to use Skype's technology to make it easier for buyers and sellers to communicate, and to offer new “click to call” advertisements, but many analysts are sceptical that eBay is the best owner of Skype. Whatever the merits of the deal, however, the fuss over Skype in recent weeks has highlighted the significance of VOIP, and the enormous threat it poses to incumbent telecoms operators.

For the rise of Skype and other VOIP services means nothing less than the death of the traditional telephone business, established over a century ago. Skype is merely

the most visible manifestation of a dramatic shift in the telecoms industry, as voice calling becomes just another data service delivered via high-speed internet connections. Skype, which has over 54m users, has received the most attention, but other firms routing calls partially or entirely over the internet have also signed up millions of customers.

A price of zero

The ability to make free or almost-free calls over a fast internet connection fatally undermines the existing pricing model for telephony. “We believe that you should not have to pay for making phone calls in future, just as you don't pay to send e-mail,” says Skype's co-founder, Niklas Zennstrom. That means not just the end of distance and time-based pricing—it also means the slow death of the trillion-dollar voice telephony market, as the marginal price of making phone calls heads inexorably downwards.

VOIP makes possible more than just lower prices, however. It also means that, provided you have a broadband connection, you can choose from a number of providers of VOIP telephony and related add-on services, such as voicemail, conference calling or video. Many providers allow a VOIP account to be associated with a traditional telephone number—or with multiple numbers. So you can associate a San Francisco number, a New York number and a London number with your computer or VOIP phone—and then be reached via a local call by anyone in any of those cities.

Furthermore, your phone (or computer) will ring wherever you are in the world, as soon as it is plugged into the internet. So you can take your Madrid number with you to Mumbai, or your San Francisco number to Shanghai. Skype and other VOIP services, in other words, are leading to lower prices, more choice and greater flexibility. It is great news for consumers—but terrible for telecoms operators. What can they do?

Watching the elephants dance

As is always the case with a disruptive technology, the incumbents it threatens are dividing into those who are trying to block the new technology in the hope that it will simply go away, and those who are moving to embrace it even though it undermines their existing businesses. Since VOIP will cause revenue from voice calls to wither away, the most vulnerable operators are those that are most dependent on such revenue.

In particular, that means mobile operators, which have been struggling for years to get their subscribers to spend more on data services, but are still hugely dependent on voice. Worse, the very “third generation” (3G) networks that are supposed to provide future growth for these firms could now undermine them, because such networks make mobile VOIP possible too. Least vulnerable, by contrast, are those fixed-line operators that are now building new networks based on internet technology, which will enable such firms to benefit from the greater efficiency and lower cost of VOIP compared with traditional telephony.

These operators are taking an “if you can't beat 'em, join 'em” approach and getting into the VOIP business. While their voice revenues will slowly evaporate, they will then be well placed to offer fee-based add-on services over their new networks. Again, this is a common pattern with disruptive technologies: forward-looking incumbents can end up giving upstart innovators a run for their money.

It is now no longer a question of whether VOIP will wipe out traditional telephony, but a question of how quickly it will do so. People in the industry are already talking about the day, perhaps only five years away, when telephony will be a free service offered as part of a bundle of services as an incentive to buy other things such as broadband access or pay-TV services. VOIP, in short, is completely reshaping the telecoms landscape. And that is why so many people have been making such a fuss over Skype—a small company, yes, but one that symbolises a massive shift for a trillion-dollar industry.

The meaning of free speech

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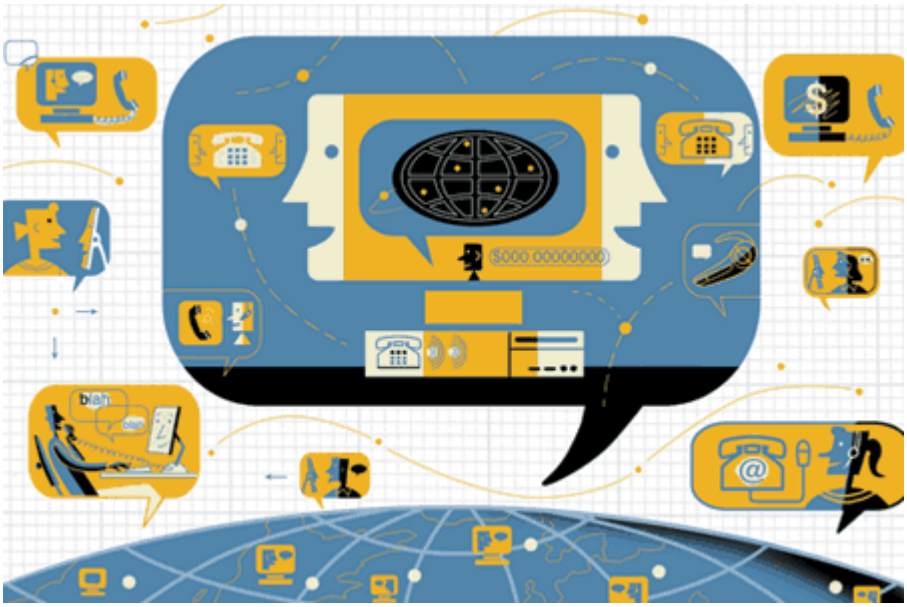


The acquisition by eBay of Skype is a helpful reminder to the world's trillion-dollar telecoms industry that all phone calls will eventually be free

NIKLAS Zennstrom and Janus Friis, the founders of Skype, which distributes software that lets people make free calls from their computers to other Skype users anywhere

in the world, don't usually travel to America. Legally, they probably could. But they prefer to avoid that jurisdiction, since they also founded (and subsequently sold) KaZaA, a peer-to-peer software company whose product many people use to share copyrighted songs. So setting foot in America could invite some legal trouble. This does not mean, however, that they cannot appear at conferences in Silicon Valley, where Skype—which uses the same basic idea of KaZaA, but applies it mainly to voice communication—is considered the next big thing.

Thus, in July, Mr Zennstrom appeared, via a Skype video call, on the screen of a packed auditorium at Stanford University, while sitting in Estonia next to Tim Draper, a venture capitalist who invested $10m in Skype. Mr Draper is the ultimate loud American, whereas Mr Zennstrom is a sombre Swede. “He's already taken down one industry and he's on to the next one,” hollered Mr Draper—referring to recording studios and telecoms companies. Mr Zennstrom started shifting uncomfortably. “I never wanna sell my stock until it's a hundred billion,” Mr Draper yelled, then started singing and dancing. The blushing Mr Zennstrom was speechless.

Of course, Mr Draper was posturing. That became clear on September 12th, when Skype announced that it had agreed to be taken over by eBay, based in Silicon Valley and the world's largest online marketplace. Mr Draper and Skype's other investors will get nothing like $100 billion, but eBay is paying a hefty sum—$2.6 billion in cash and shares and perhaps more if certain criteria are met—nonetheless.

This pairing took many people by surprise. There have been rumours that Yahoo!, Google, Microsoft and other technology companies were also interested in buying Skype. Any of these might have made a more obvious fit, since each also has instant-messaging software that can be used for free phone calls (or “voice chats”, as opposed to text chats) between computers. Google, the world's most popular internet search engine, launched its own voice-chat software in August. A week later, Microsoft bought Teleo, a San Francisco company that lets people call conventional telephones from their computers (as Skype also does, for $0.02 a minute). Yahoo! had already bought Dialpad, another Skype-like firm, in June. AOL, Apple and others have similar products.

As Meg Whitman, eBay's boss, and Mr Zennstrom explain it, a combination of eBay and Skype is not all that far-fetched. From eBay's point of view, placing cute Skype buttons on the web pages where people trade used cars, houses and other items that usually require voice bargaining “reduces friction”, says Ms Whitman. Buyers can simply click on the button and talk to sellers. Another idea is to make money from “pay-per-call” advertising, where advertisers would place voice links (ie, Skype buttons) on certain pages just as they now place text links on, say, the search-results pages of Google. Whenever a web surfer clicks on one of these links and talks to a salesperson, the advertiser would pay eBay and Skype a fee. Google got rich by doing this in the text world; there is no reason why eBay might not be able to do it in the voice world.

From Skype's point of view, the deal strengthens its existing link with PayPal, eBay's online bank, which it uses to charge for services such as calls from computers to conventional telephones (called SkypeOut) or from conventional phones into Skype (called SkypeIn). This involves prepaid accounts, which Skype users can top up via PayPal with their credit cards.

For Skype, however, the main attraction may be that eBay, unlike the other potential suitors, plans to leave it largely alone, both as a brand and as a business. “When Yahoo! and Microsoft buy companies, they typically disintegrate them,” says Mr Zennstrom. His vision for Skype, by contrast, is to become the world's biggest and best platform for all communications—text, voice or video—from any internet-connected device, whether a computer or a mobile phone.

This is every bit as audacious as it sounds. Mr Zennstrom, in general, is a modest man. But his company is only three years old, will probably make only $60m in revenues this year, and will certainly not turn a profit. So it is the fact that his ambition is not nearly as ridiculous as it sounds that should make incumbent telecoms firms everywhere break out in a cold sweat.

That is because Skype can add 150,000 users a day (its current rate) without spending anything on new equipment (users “bring” their own computers and internet connections) or marketing (users invite each other). With no marginal cost, Skype can thus afford to maximise the number of its users, knowing that if only some of them start buying its fee-based services—such as SkypeOut, SkypeIn and voicemail—Skype will make money. This adds up to a very unusual business plan.

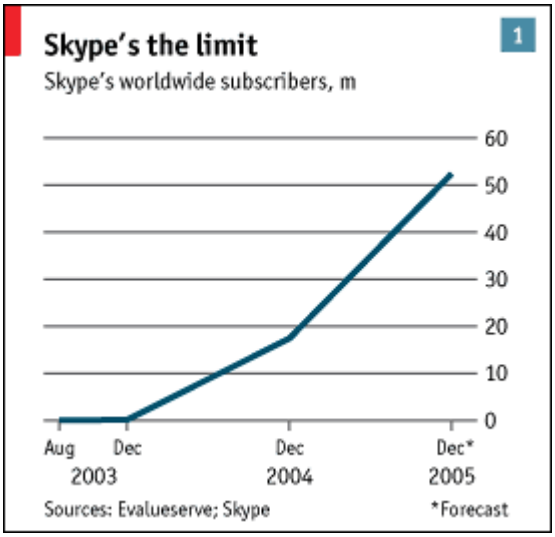
“We want to make as little money as possible per user,” says Mr Zennstrom, because “we don't have any cost per user, but we want a lot of them.” This is the exact opposite of the traditional business model in the telecoms industry, which is based on maximising the average revenue per user, or ARPU. And that has only one logical consequence. According to Rich Tehrani, the founder of *Internet Telephony*, a magazine devoted to the subject, Skype and services like it are leading inexorably to a future in which all voice communication, near or far, will be free.

End of the line

The technical term that encompasses all forms of voice communication using the internet is voice-over-internet-protocol, or VOIP. This includes pure computer-to-computer calling as well as the various hybrid states, such as a Skype user connecting to the traditional telephone network, or even two people talking on seemingly conventional phones that are linked, behind the scenes, via the internet. It also includes residential VOIP providers such as Vonage, based in New Jersey and the market leader in America with over 1m subscribers, that supply their customers with adapters so they can plug ordinary telephones into their broadband connections without using a computer.

Sandvine, a telecoms-equipment firm, estimates that there are 1,100 VOIP providers in America alone. But the trend is worldwide. IDC, a market-research firm, predicts that the number of residential VOIP subscribers in America will grow from 3m at the end of 2005 to 27m by the end of 2009; Japan already has over 8m subscribers today. Worldwide, according to iSuppli, a market-research firm, the number of residential VOIP subscribers will reach 197m by 2010. Even these numbers, however, do not include people using VOIP without subscribing to a service (ie, by downloading free software from Google, Skype or others). Skype alone has 54m users.

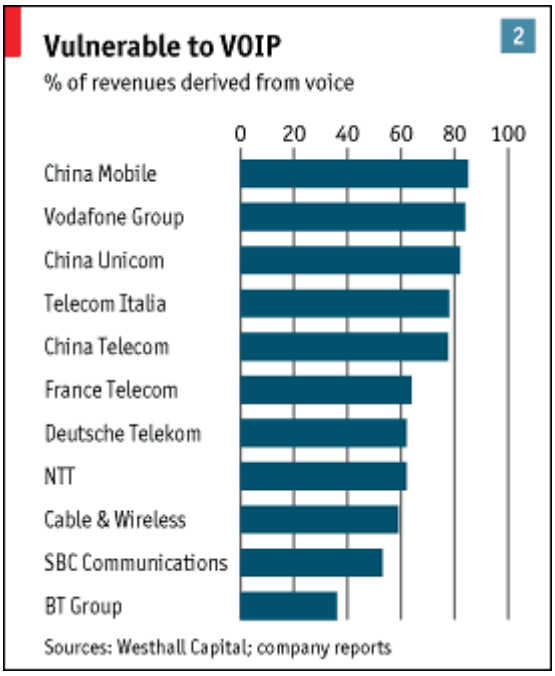
Even before VOIP makes 100% of telephone calls in the world completely free (which may take many years), it utterly ruins the pricing models of the telecoms industry. Factors such as the distance between the callers or the duration of a call, the key determinants of cost today, are simply irrelevant with VOIP. Vonage already lets its customers choose telephone numbers in San Francisco, New York or London, no matter where they live. A Londoner calling the London number is making a "local" call, even if the Vonage subscriber is picking up the phone in Shanghai. As when checking e-mail on, say, Hotmail, the only thing needed is a broadband-internet connection, but it can be anywhere in the world. Sooner or later, people will discard their unwieldy phone numbers altogether and use names, just as they do with their e-mail addresses, predicts Mr Zennstrom.



Call duration is also becoming irrelevant. "A lot of people open a Skype audio channel and keep it open," says Mr Zennstrom. After all, it costs nothing. Many people with Apple computers are already accustomed to this. They open an application called iChat, which is a video and voice link, and stay connected to their loved ones far away. Increasingly, members of a family or a business team can stay online throughout the day, escalating from unobtrusive instant-messaging ("Can you talk?") to a conference call, a video call and back to a little icon on their screen.

It is thus altogether wrong to call this phenomenon the end, or death, of telephony. "Calling it the death of telephony suggests people aren't going to make calls, but they are," says Sam Paltridge, a telecoms guru at the OECD. "It's just the death of the traditional pricing models." In short, all this is great news for consumers and awful news for telecoms operators. "VOIP will destroy voice revenues faster than most analysts' models predict," says Cyrus Mewawalla, an analyst at Westhall Capital. "Voice will very rapidly cease to become a major revenue generator for all telecoms operators, fixed and mobile."

That said, some telecoms carriers are much more vulnerable to VOIP than others, says Mr Mewawalla. Telecoms operators offer and charge for a number of services besides pure voice calls. Because VOIP will cause only the revenues from voice calls to shrink, it will hit those operators hardest that are most dependent on their revenues from voice (see chart 2).



For pure mobile operators, such as Vodafone or Taiwan Mobile—as it happens, Taiwan is the country with the highest ratio of Skype users—VOIP could be an "enormous problem", says Mr Mewawalla, because voice accounts for over 80% of their revenues. By contrast, VOIP is less threatening to integrated operators (ie, those offering both fixed and mobile services) such as Deutsche Telekom or Japan's NTT. And those carriers—such as BT, France Telecom or KPN—that are currently building next-generation networks based on internet technologies will be able to offer VOIP services themselves, bundled with other offerings, and might emerge relatively unscathed.

Some operators are taking an unenlightened view by trying to delay the advance of VOIP. China Telecom has been blocking access to Skype from Shenzen, according to local newspaper reports. Vodafone has introduced wording into new contracts for some German subscribers reserving the right to block VOIP in future, though a spokesman for the company says it is not doing so at the moment. Clearwire, an American wireless-broadband provider, also reserves the right to block VOIP traffic. In February, Madison River Communications, a rural phone company in North Carolina, was fined $15,000 by regulators for blocking access to Vonage's VOIP service. Occasionally, operators have even blocked access to Skype's website, thus preventing people from downloading the software or topping up their calling credit.

The more enlightened approach—which most operators in rich countries, to varying degrees, accept—is to compete with VOIP openly or even to embrace it. Already, says Mr Paltridge, pricing of traditional phone services is changing quite radically as operators "try to adjust and to compete with the Skypes of this world". Operators are moving towards flat-rate pricing plans for traditional telephone service, so that the marginal price of making calls falls to zero. Many American regional operators offer unlimited local and national calling for a fixed monthly fee, and such schemes are also becoming popular in other countries.

Several incumbent operators have also launched their own VOIP services, such as Verizon's VoiceWing and BT's Broadband Voice. These offer lower prices than traditional telephone service but are generally not as cheap as a call between Skype and a regular phone. "If you can't beat 'em, join 'em," says John Delaney of Ovum, a consultancy. Such services are an admission that a less lucrative VOIP customer is better than no customer at all. Switching to VOIP also helps operators by lowering

their own costs dramatically. BT and others are building new, internet-based networks behind the scenes, which will carry all voice traffic as VOIP even if the calls start or end in the traditional way.

The other argument for embracing VOIP is that the incumbents can then start offering the fun new services that VOIP makes possible and charging for them. This goes far beyond traditional voicemail. Video-conferencing and unified messaging—whereby all forms of communication, from voicemail and video messages to e-mails or entire electronic documents go into one virtual “inbox”—will become common, says Wendy McMillan-Turner, head of voice services at BT. Since all of these features are essentially software programmes, they can all be integrated with applications that people today use on their computers, such as Outlook calendars and contacts files.

The service that many telecoms operators are most excited about, however, is IPTV, which refers to television (and entertainment in general) being delivered over new and super-fast broadband-internet connections into homes. This would allow them to charge for a bundle of services, including broadband access, entertainment and voice. The voice component could then atrophy gracefully and eventually be thrown in for nothing. “Ultimately—perhaps by 2010—voice may become a free internet application, with operators making money from related internet applications like IPTV,” says Mr Mewawalla.

Cable operators are coming at VOIP from exactly the opposite direction. They already offer television and entertainment, as well as broadband access, so they might as well offer cheap telephony as well. This puts the cable companies in a good position. Unlike the telecoms operators, they do not depend on voice for their revenues today, so they can use cheap VOIP service as a competitive weapon to make life difficult for the telecoms operators, who are increasingly their only competition. In California, for example, most people have a choice between one cable company, Comcast, and one traditional telecoms carrier, SBC. Since voice uses very little bandwidth compared with television, the cable companies need not even add a lot in the way of bandwidth.

The result, says Mr Mewawalla, is that voice service is fast becoming a marketing freebie to make customers “sticky”—to keep them loyal. “I would expect people to advertise free calls with VOIP, subsidised by other elements of the package,” says Ms McMillan-Turner. Thus, BT will consider value-added services sold around VOIP as voice revenues in future, she says. BT hopes that selling such services will offset the inevitable decline in traditional voice revenue. Evalueserve, a consultancy, predicts that American and European fixed operators' long-distance voice revenue will decline by around 40% by 2008, and that in Europe 50% of broadband users will give up their voice lines by 2008.

Mobile operators face a far greater challenge than fixed-line carriers. Voice accounts for the bulk of their business and they cannot (at least today) offer broadband access as easily as the cable and fixed-line companies. New “third-generation” (3G) networks were supposed to make possible whizzy new data services to compensate for flat and even declining revenues from voice calls, but consumer adoption has been slow.

Worse, those very 3G networks that are supposed to provide future growth for the industry could now undermine it, since they make possible VOIP calling over mobile networks. Already, one mobile operator, E-Plus in Germany, has announced a deal that will allow subscribers to use Skype on its 3G network. Users would thus pay only for the internet connection, while making free calls to other Skype users and to other telephones for very little. E-Plus hopes to win valuable business customers and to put pressure on much bigger but less agile rivals such as Vodafone.

Today, VOIP calling over 3G networks is still very much a minority sport, but as 3G coverage and transmission speeds improve—something the industry is racing to achieve—it will become common. This represents a mortal danger for mobile operators. “VOIP on mobile is the first real threat they are going to face, and they are in a state of shock,” says Mr Mewawalla. Mobile operators generally charge three to five times as much as fixed operators for each minute on the phone, so they have far more to lose from falling voice prices. International travellers will use VOIP over hotel-room broadband links or Wi-Fi hotspots in airports to save on the roaming charges by their mobile-phone company.

Vodafone counters that, like BT, it is moving towards internet-based networks that will reduce its own cost of carrying calls and make possible new value-added services. But this sounds unconvincing. Much more so than fixed-line operators, mobile operators would have to cannibalise their current business in order to generate new revenues from VOIP. Ironically, this means that BT, once regarded as a dinosaur-like incumbent, is now being held up as a shining example of an operator that is embracing the future, while Vodafone, whose pure-mobile strategy once seemed visionary, now stands accused of being on the wrong side of history. At the end of the day, there is no getting around the reality, as Skype's Mr Zennstrom says, that “something that is a great business model for us is probably a terrible business model for them.”