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# Internet Service Providers— Anarchy in the UK?

*Few markets have shown more dynamism than the market for residential Internet access provision, where Internet service providers (ISPs) have to fundamentally reassess their business models on a regular basis. This paper looks at the ways in which ISPs have changed over the last few years, and presents some wild (informed) guesses as to the way that the market may develop in the future. In particular we will consider the role of telecommunications companies in delivering Internet access, and how ISPs must adapt to remain competitive in the long run.*

## Introduction

There are currently between 10 and 500 Internet service providers (ISPs) in the UK. The actual figure depends on your definition of ISP. This paper considers what an ISP once was and how this definition is evolving. There are lessons to be learnt by both ISPs and telcos, as well as those who have Internet-based services or content they wish to promote. We shall see that there is method to the madness rather than simply 'anarchy in the UK'.

## History In The Making

As someone once said 'Events in the past may be roughly divided into those which probably never hap-

pened and those which do not matter.' One version of history goes like this:

In the mid-1960s, the latest technological advances involved time-sharing, which allowed terminal users to interact with computers and each other. Distant users would connect to the central computer using the telephone network. This was soon found to be an inefficient use of bandwidth, since the telephone line needed to be kept open even though the terminal was not transmitting data all the time. This would not have caused too much worry, except that the academics could not afford their long-distance, long duration telephone bills. So, in the spirit of innovation that is still present in the Internet today, they invented the concept of 'packet switching' which allowed multiple data streams to be broken down in to small units and interleaved over the same circuit. This removed the need for multiple telephone lines and hence brought down the cost significantly, especially on very expensive international lines.

This love/hate relationship between the Internet and telephone networks continues to this day, whether it be

leased lines or public switched telephony network (PSTN) access. In the UK, PSTN charging models have significantly affected the way ISPs build their networks in order to maximise their revenue streams. This is further explored in this section.

## POP along to your local ISP

The first commercial ISPs (Demon and PIPEX) started selling Internet access in the UK in 1992 by rolling out a national network of interconnected points of presence (POPs) (Figure 1). These ISPs offered customers Internet access, e-mail and newsgroups, and were accessible by either a local number (if a POP was within your local, or adjacent call area), or a national telephone number, charged at standard rates. ISPs charged a monthly subscription to customers, which was used to offset the costs of telephone lines into their modems, leased lines to make up their backbone connectivity and general operational and equipment costs. Other ISPs soon began to appear using the same charging model, often simply concentrating on specific geographical areas.

Around 1995, Comuserve and AOL entered the UK Internet market

## The Obligatory Disclaimer

This paper describes the evolution of the ISP market in the UK, and in so doing mentions company names and brands. The inclusion of such names in this paper does not constitute an endorsement of their product, nor should a company's exclusion constitute the contrary. The very nature of Internet access provision means that different ISPs may be able to meet different requirements in different ways, at different times.

As can be seen by the paper, the ISP market is a dynamic market, and by the time this paper is presented and certainly before it is published, the market may well have changed dramatically once again. As such, this paper only represents a snapshot of the market at a particular moment in time (end of May 1999), pulled together from publicly available information such as press releases, newspaper reports and public presentations.

The observations and opinions stated are those of the author and may not represent those of OFTEL. Nothing within this document should be considered formal regulatory opinion or advice.

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with an on-line usage-based charge in addition to their monthly subscriptions and telephone access charges. This was justified on the basis that they provide content and value-add in the form of a proprietary user-friendly interface.

**Virtual POP, real benefits**

In 1995, Energis, a UK telco, introduced the concept of virtual POPs (vPOPs), where calls made by the subscriber to a geographic local number could be routed across the PSTN to a central POP remote from the customer (Figure 2). Mercury, another UK telco, suggested that this type of arrangement would be more appropriate behind a local-call rate non-geographic numbering range. It was from this point that ISPs started to use 0345, 0645 and 0845 number ranges.

This arrangement benefits ISPs immensely as it allows them to offer national coverage from a single POP, and dimension their networks more efficiently. A number of ISPs chose to base their businesses in the same building as LINX, the UK's main peering facility, thus reducing their costs even further. ISPs generally kept the same charging model (subscription + local rate calls), though some used it as an opportunity to introduce cheaper subscriptions.

This move led to an increase in the number of ISPs offering national local rate coverage, which benefited customers who before only had access to a small number of locally based providers.

**Share and share alike**

The need to have InterConnect and Accounting Separation (ICAS) compliant interconnect rates for 0800, 0345, 0990 and Premium Rate services led to OFTEL being asked to produce the interconnect formula for number translation services (NTS). This formula is used to calculate the revenue sharing between originating, transit and terminating operators, and compared to the formula for geographic calls, gives a higher share to the terminating operator. Figure 3 shows the revenue sharing arrangements.

Terminating operators soon began to realise that Internet traffic is a very lucrative source of revenue thanks to the NTS payments for long-duration calls. As such terminating operators began to offer free connection and line rental to ISPs, to encourage them to bring traffic to

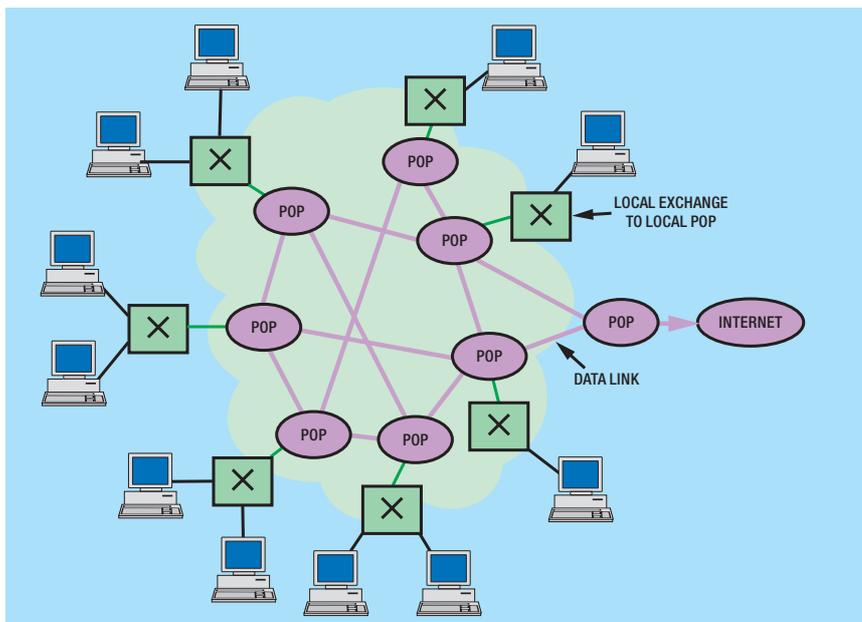


Figure 1—Geographic POPs

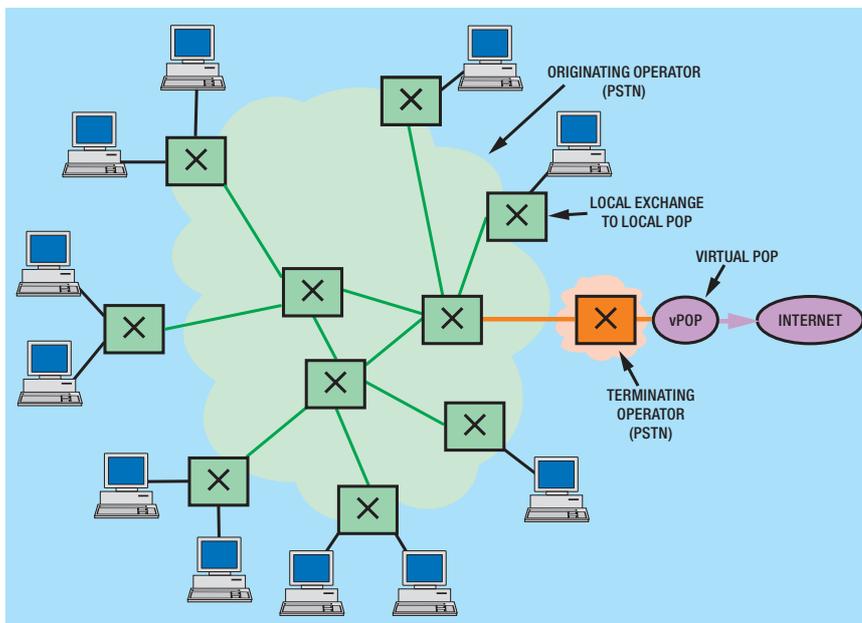


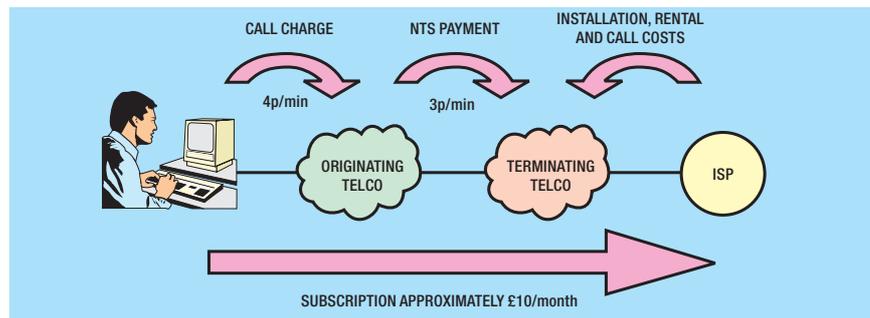
Figure 2—Virtual POPs

their network. After a while some operators were even willing to share some of their terminating revenues in order to attract ISPs to their network.

**Pay as you go**

On the 1 October 1998, BT launched its BTclick and BTclick+ products. This introduced a new concept of 'pay as you go' Internet access requiring

Figure 3—Number translation services



no pre-registration. In order to use the Click products, the user simply dials the access number and is charged at 'local-rate plus one penny' a minute. This extra penny a minute was used to fund the Internet access. BTClick provided solely Internet access, while BTClick+ included web based e-mail.

Following the success of Freeserve (see next paragraph), the BTClick products were repriced at local-rate pricing, and some rebranded (for example, BTClickFree).

**Nearly free**

Just over one week before the BTClick products were launched, Dixons, the UK high-street electronics goods retailer launched its own ISP called *Freeserve*. This would have sparked little interest were it not for the fact that Freeserve was subscription free, yet still offered all the benefits of a traditional ISP, such as Internet access, e-mail and web space, all accessible for local call rates. Freeserve's press launch claimed that UK households could save £165m a year in subscription costs.

Freeserve caught the imagination of consumers and the press. Individuals who were previously spending £10-15 a month on a subscription ISP realised that they could get the same service for £10-15 less with Freeserve and considered changing ISP. Many test-drove their new 'free' account before cancelling their old ISP account. After only 18 weeks Freeserve signed up its millionth customer. Curiously certain other ISPs, who maintained their subscriptions, also saw their customer base enlarge (at least in the short term) as the hype surrounding Freeserve

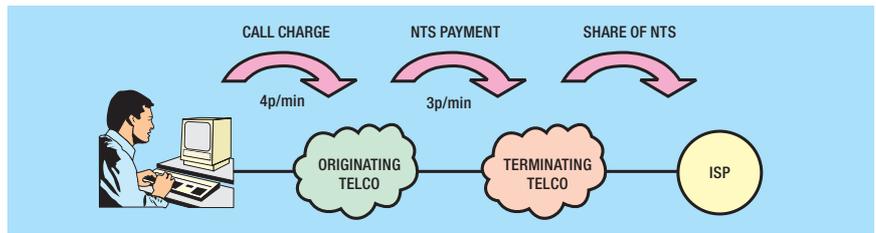


Figure 4—Subscription-free model

increased consumer confidence and curiosity in the Internet generally, thus growing the UK Internet access market as a whole.

Freeserve claims to cover its costs through out-payments made by Energis. Energis can afford to make these payments due to the increase in traffic that Freeserve brings to its networks, and hence the amount of NTS money generated (see Figure 4). Freeserve has additional revenue streams through advertisement space on its 'portal site' and Dixon's e-commerce site. Freeserve also charge £1/minute for its technical support desk.

Freeserve's success must in part be due to their first-mover advantage, coupled with their use of the Dixon's brand. There are now over 130 subscription-less ISPs offering service in the UK. Some of these are tied to existing high-street brands, while some are Internet-only companies. These services are discussed further in the next section.

Table 1 compares some of the ISPs in the marketplace.

**How Free Can You Get?**

As we have seen there has been considerable innovation and change in the area of Internet access, ever moving towards the panacea of

completely free access. Already ISPs are fighting to be 'free-er' than anyone else. Nothing is ever 'free' of course, so the money must come from somewhere, either directly or indirectly. The rest of this section looks at how ISPs might achieve this in practice. Some of these models are already being tested by some of the big name players.

With all these services, once one ISP has offered a completely free product, commercial pressures mean that other ISPs have to match the offer, or provide value-add elsewhere. These pressures will be discussed in the final section of this paper.

**One (monthly) price for as much as you can eat**

So what sources of revenue might an ISP use to cover the cost of Internet access provision? ISPs could of course charge subscriptions to their customers in exchange for unlimited access, perhaps behind an 0800 number range. In this model the calls made by the customer are paid for by the ISP, offset against the monthly subscription. The obvious issue here is that the ISP must set the subscription rate high enough to cover the costs of the 0800 access (and hopefully make some profit), but not so high as to be unattractive to consumers.

An ISP may decide to set the subscription rate equal to subscribers' expected monthly usage. In this case it is especially important to set the subscription rate at a price point where low-users are attracted to the tariff, otherwise only high-users will join, skewing the average and forcing the ISP to make a loss.

ISPs have to balance the time-based outgoing charges for the 0800 number against their expected flat-rate subscription payments. In this model, the ISP carries a high level of risk, especially where it is known that subscribers' usage increases considerably, often by 400%, when they are using an unmetered access provider.

That said, a number of ISP are experimenting or already offering

Table 1 State of the market 1 April 1999

ISP	Subscribers	Subscription?	Updates (end May)
Freeserve	1.3 million	Free	1.5 million subscribers quoted in some publications
AOL + Compuserve	900 000	Monthly	Sub rate reduced from £14.95 to £9.99 announced end May
Demon	250 000	Monthly	
BT Internet	165 000	Monthly	0800 (toll-free) access at weekends announced end May
MSN	160 000	Monthly	125 000 subscribers, subscriptionless announced end May
Virgin.net	145 000	Free (April 99)	250 000 subscribers
Line One	70 000		Free (May 99)

Source: Various (MSNBC, FT, press releases etc)

limited 0800 Internet access in exchange for a monthly subscription. Most notable in the last few days BT Internet has announced free access at weekends, and AOL is known to be trialling an option, both of which require monthly subscriptions.

### Adverts

One ISP offered subscriptionless Internet access even before Freeserve. In March 1998 an ISP called *X-Stream* offered a subscriptionless service, where the only cost to the consumer was the local-rate telephony access. In exchange for this privilege, *X-Stream* placed banner ads along the top of the user's screen. In March 1999, when main stream ISPs were offering subscriptionless services, *X-stream* announced it would offer completely free access to its service at particular times of the day via an 0800 number, in exchange for customers displaying its banner ads. Following this *X-stream* announced it had now reached 305 000 subscribers.

### Call revenues

Another model being explored is that of giving away completely free access to the Internet in exchange for customers changing telephone supplier. The concept here is that the profits of non-Internet calls can be used to offset the cost of Internet calls. When one supplier, LocalTel, in conjunction with Tempo (another high street electrical goods retailer) launched *Screaming.net* there were reports of brawls in stores as people fought to get hold of the sign-up CDs! Such was the interest that 15 000 CDs were distributed in the first week.

### If you can't beat 'em, buy 'em

An ISP could reduce costs in a number of ways. One such way is to reduce the costs of the underlying network. This is one of the key drivers as to why telcos and ISPs are so closely affiliated in the UK, since by being an infrastructure provider, real cost savings can be made. When we look at the list of the top ISPs we find that nearly all of them, if not all of them, are owned or closely affiliated to telcos. This has not always been the case, as the telcos were relatively late arrivers to the Internet party. They made up for their late adoption by buying ISPs, together with their customer base, and in so doing injected capital funds

in to needy ISPs, many of whom were still to make a profit.

### Really virtual ISPs

In addition to running their own ISP services, a number of ISPs and telcos are selling solutions which enable anyone to set up an ISP without ever having to own any infrastructure. BT, Telinco, Easynet and others all have products which have enabled over 130 companies to enter the free ISP market—toy shops, football clubs, supermarkets, banks and newspapers all act as ISPs. Anyone with a brand or who represents a community has got involved. Estimates are that one new ISP is created every week.

### The Identity Parade

The consumer now has a vast number of ISPs to choose from, all offering very similar services. With little to differentiate services other than a brand name (which in some cases is all that is needed!), ISPs are looking for new areas to set themselves apart. Even the cost of technical support is used as a differentiator. Some ISPs are even branching in to other telecommunications services, such as fax/e-mail gateways, voice-mail and personal numbering.

Others, such as Freeserve see Internet access as a way of getting consumers to their on-line shops, and see e-commerce as both value-added content and an additional revenue stream.

### Free and easy?

The subscriptionless model also creates its own problems for ISPs. Instead of having one ISP, many people have registered with multiple free ISPs, and may use only one or two regularly. This causes problems for ISPs who may not be able to accurately predict demand for their services. It also causes problems for statisticians trying to estimate the number of 'actual' subscribers, rather than simply those who have registered.

The subscriptionless model also gives consumers the impression that 'calls cost money, but the Internet bit is free'. Consumers often consider that free equals worthless which leads to high churn rates between providers, as there is little commitment to particular ISPs. As a result there are huge first mover advantages to be made in new products through a very portable consumer base!

### Innovative sticky products

Whether the ISP is free or not, it is clear that the real money in the future will come from value-added products and content. One feature that needs to be considered is how 'sticky' that product or content is. For example, consumers who are greeted by the same pictures on an ISP's portal site each time they log on, will soon lose interest and make some other web site their start page, thus reducing the ISP to simply a conduit to the wider Internet.

This is the heart of the argument—what is left for an ISP? If their business is solely Internet access then how can they compete with the telcos and their ready built national data networks?

### Quicker, unmetered and always on

This trend will continue as new technologies to access the Internet are rolled out. Technologies such as ADSL, cable modems, radio and satellite offer a higher-bandwidth permanent connection to the Internet, often for a usage-independent fixed monthly fee. Digital TV set-top boxes are also likely to have integrated Internet access. Many of these solutions require a national network of local POPs to collect traffic, meaning that once again the telcos are likely to be in the best position to exploit their roll-out. Regulation will ensure that any such service that BT provides will allow access to other operators.

ISPs concentrating on PSTN access may soon find themselves bypassed by these new technologies, and will therefore need to fundamentally rethink their access strategies in the longer term. Their immediate priorities should be getting experience of using these new technologies, and working out how they can incorporate them in to their portfolio of products.

These technologies could lead to a greater distinction between basic conveyance services, and value-added higher layer services such as content and services. Already we can see dedicated on-line e-mail services and sites offering free web space, where previously these services were only available as part of an ISP's offering. A look at the top 100 web sites reveals that only a small number (most notably AOL and MSN among others) are actual ISPs. All of these factors lead to less consumer commitment to their particular ISP.

## Summary

ISPs have changed significantly since the early days of local POPs run by one man in his garage. Since then we have moved to the vPOP model, and have seen innovative use of the PSTN charging model to offer subscriptionless and even free access. In the future we are likely to move back to a national network of local POPs, where broadband access is the norm.

ISPs have constantly kept up with increasing customer numbers, each customer requiring more bandwidth thanks to improvements in PSTN modem technology and integrated services digital network (ISDN), and, in the not too distant future, new broadband access technologies.

Changes in the market have shown the effect (real or psychological) of the change to the subscription free model on subscriber numbers. Lots of genies have been let out of lots of bottles with regards to 'free' access, and we will inevitably see 'free', or at least unmetered, access to the Internet as standard soon. How this is financed, and whether it is sustainable in the long run remains to be seen, especially allowing for the increased customer usage which inevitably results from 'removing the clock'.

ISPs have driven Internet take-up in the UK and should be praised for their innovation in many areas. Once again they need to consider their position to avoid being swallowed up by the new world where access and conveyance are increasingly becoming independent of content and services. ISPs need to decide which side of the fence to be on, as only the largest will be able to do everything.

## Glossary

**ICAS** Interconnect and accounting separation

**ISDN** Integrated services digital network

**ISP** Internet service provider

**NTS** Number translation services

**OFTEL** Office of Telecommunications, UK telecommunications regulator

**POP** Points of presence

**PSTN** Public switched telephony network

**vPOP** Virtual point of presence

**Telco** Telecommunications operator

## Bibliography

ABBATE, JANET. A Tale of Two Networks: Early data communications experiments in England and America. IEEE History Centre <http://www.rci.rutgers.edu/%7Ejea/papers/2Nets.html>

OFTEL documents of interest available at [www.oftel.gov.uk](http://www.oftel.gov.uk) include:

- Interconnection charges for pay-as-you-go Internet services (for example, BT Click, BT Click+).
- Access to bandwidth: Bringing higher bandwidth services to the consumer (local loop unbundling).
- OFTEL Consultation Paper on the Relationship between Retail Proces and Interconnection Charges for Number Translation Services (NTS formula).
- Memorandum by OFTEL for Trade and Industry Select Committee: Inquiry into Electronic Commerce) includes section on Internet access).

## Biography



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David Simpson is currently working as a Senior Multimedia/Telecommunications Specialist in the Regulatory Policy section of OFTEL, the UK telecommunications regulator, where he is project manager for OFTEL's Internet Project. His responsibilities include the regulatory aspects of emerging technologies including the Internet. Before joining OFTEL he worked for Cable and Wireless Communications in its Network Development Division, where his responsibilities included implementing an international Internet telephony trial, the development of a fixed radio access product and general network access issues. Dave graduated from Sheffield University in 1993 with a degree in electronics (Information and Systems) Engineering.