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## **UK Internet Access and Global Competitiveness**

### **Ambitions**

“The UK will have the fastest broadband of any major European country by 2015” [\[1\]](#). So said the then Culture Secretary Jeremy Hunt in August 2012. He reiterated that he wanted to bring high-speed broadband – which he defined as greater than 24 Megabits per second – to more than 90% of the country. Fibre to the Cabinet (FTTC) was a “temporary solution to get higher speeds”.

Two years on, achievement of Mr Hunt’s ambition has been frustrated by European red-tape, vested interests of the larger industry players (sometimes known as blue-tape), and the laws of physics. Yet the ambition remains and the government is now looking to the longer-term by seeking views on its “Digital Communications Infrastructure Strategy”. This paper has been developed in order to reply to that Strategy.

### **Assumptions**

The current thinking as to the best way to supply Internet access to the UK’s consumers and businesses are based on a number of key assumptions:

1. That the existing structure of the Telecoms and Media industries is sufficient for the UK to move to the next level in global competitiveness and cost-effective provision of high quality Internet access.
2. That it is cheaper and better to provide Internet access via the existing fixed line and mobile networks (that were originally designed for voice / mobile telephony).
3. That the “market” should supply Internet access with as little government intervention as possible – and that the industry is best served by those who can exert “economies of scale”. The government should only intervene where the telecoms industry is not willing to invest (such in the rural final third).
4. That Ofcom is being broadly effective by conducting its legal duties (as it relates to telecommunications services). These are to ensure that the UK has a wide range of electronic communications services and that the limited availability of radio spectrum is being used in the most effective way.

We believe that each of these assumptions is flawed in different ways and that the UK has a chance to elevate itself to a world-leader by challenging these assumptions and encouraging new structures

that will accelerate economic growth and lead the world in re-thinking how best we configure Internet access services for the 21<sup>st</sup> century.

## **Global Competitiveness and Industry Structures**

In January 2012, OC&C Strategy Consultants (in partnership with Google) published the “Global Retail E-mpire” report. It analysed the estimated value of online retail based on six of the biggest e-commerce markets – the UK, the US, Germany, the Nordics, the Netherlands and France.[\[2\]](#) The UK came out on top. Yet this is the tip of the iceberg.

Whilst governments at the European and National level have outlined similar ambitions and aspirations of internet speed and coverage (such as those of Jeremy Hunt), such measures hide the structural weaknesses of an industry that has evolved out of older technology stacks that were based on design requirements for voice telephony services on both fixed-line and mobile networks.

Meanwhile, research and development by the Telecoms Equipment Manufacturers (such as Ericsson, Nokia and Huawei) has focused on adapting and propping-up older network technologies. Indeed some have estimated that up to ten times more R&D has been spent on developing copper-based DSL technology than on equipment to support the newer fibre-based infrastructures.

The vested interests in the telecoms industry have, so far, done their best to block and tackle in order to protect their market share. That is the way that “free” markets work.

Yet there are examples where governments have tackled the problem through regulatory intervention. Singapore and Jersey (wholesale technology replacement) as well as New Zealand (structural separation) are often cited as better models. The UK telecoms industry (and BT in particular) says that these models are specific to the countries in which they operate and that the UK has a good model with the functional separation of BT. This is in contrast to the cable industry (that has been rolled-up into Virgin Media in the UK) who are not subjected to any substantial regulatory conditions.

The incumbent fixed-line (and mobile) operators present powerful arguments in their struggle to maintain and grow market share. Yet we believe that, for the UK to take the next leap in global competitiveness, it is time for fresh thinking. That thinking should be based on:

1. Forward-looking views on how the Internet is likely to evolve and develop
2. Understanding the real bottlenecks in the Internet and ensuring that these are unblocked
3. A new industry structure that will allow investment in new structures to support the rapid growth of competitive infrastructure investment where it is needed.

## **Analogy: Trains and Planes**

The 1850s saw a scramble for the rail barons to get their tracks laid and networks built. The telecoms industry had a similar scramble in the run-up to the dot-com bubble in 2000.[\[3\]](#)

No one would have dreamt of building airports in the 1850s. It took another fifty (or so) years to develop powered flight. And the hubs and physical exchange points for passengers to get on and off aircraft required a new architecture and a new set of physical locations.

The development of the next generation of high-speed Internet access will also require such new thinking. We already see some of the new structures emerging such as in:

1. Internet exchanges (such as LINX, AMS-IX etc.)
2. Purpose-built carrier-neutral data centres
3. Fibre deployed more and more to the edge of the network (FTTC, FTTRN[\[4\]](#))
4. Picocells[\[5\]](#) and new WiFi access technologies
5. Content Delivery Networks (CDNs) and modern caching technologies
6. Smartphones and wearable technologies
7. Internet-of-Things and M2M technologies and applications

In order for the UK to accelerate the roll-out of these new technologies, the older (telephony-based) infrastructures (and exchange points) are creaking. Just as railway terminals are not fit-for-purpose for housing long distance and short-haul airlines, so the old telephone exchanges and base stations are insufficient (but sometimes useful) for the distribution of Internet access to achieve near 100% coverage at superfast speeds.

### **Laws of Physics and Design Choices**

It is not within the scope of this paper to go into the pros and cons of different technologies. Suffice it to say that the faster the older “train networks” go (or in telecoms terms, the fixed-line FTTC and mobile 2G/3G/4G services), they will never reach the speed of delivery of the “airlines” (fibre-to-the-premise and fast Ethernet local area networks). That said, in the 21<sup>st</sup> century both systems live side-by-side to give us choices in transportation. Just as Gatwick and Heathrow are served by modern stations to take people to and from the airports into the city and other parts of the rail network.

### **The Rise of the Local Digital Exchanges**

So it is that we need to develop local exchange points that are fit-for-purpose. We need to develop new local and regional “digital airports” (or carrier-neutral data centres and internet exchange points) that are in close proximity to the rail terminals so that traffic can move easily from one system to another. We call these “Local Digital Exchanges”.

The opportunities to site these new hubs in cities and towns that wish to attract the new digital businesses and the jobs that will make the UK competitive are many. Just as Internet Exchanges can uplift a country’s economic activity (GDP, GVA or whatever measure is important), so it is that a local and regional digital exchange can do the same.

LINX has recently launched Internet exchanges in Manchester and Edinburgh – and has plans to do a few more. However, we need to accelerate this trend.

Whilst both Internet exchanges and Digital exchanges share common themes (governance, transit and peering) the difference between a Digital Exchange and an Internet Exchange is that a Digital Exchange is co-located with SMEs who depend, thrive and grow on a concentrated set of digital businesses being co-located in a part of a city or town. This co-location effect of both digital communications equipment AND people will give, in our view, a unique competitive advantage to the UK and the cities and towns that invest in such initiatives.

We believe that the most successful characteristics of these exchange points will take the best of the current European Internet Exchanges (such as LINX) – and not, (like in the US) be owned by any single player. They should have the following governance principles:

1. Local Digital Exchanges (LDX) should be mutually owned and truly “open”.
2. New members should be able to join with simple criteria and the payment of a membership fee.
3. “One member, one vote” so that the vested interests cannot buy a controlling share.
4. LDX exchanges very simple products which its members can add value to. Examples are Rackspace, VLANs or local dark fibre.
5. The LDX invests all monies that are paid by members to grow and improve the service.
6. Assets are indivisible. Members who leave can’t take any assets with them.