Engineering the future of communications - 2012

‘A communicating economy’
The IET

The Institution of Engineering and Technology (IET) is a global organisation, with over 150,000 members representing a vast range of engineering and technology fields. Our primary aims are to provide a global knowledge network promoting the exchange of ideas and enhance the positive role of science, engineering and technology between business, academia, governments and professional bodies; and to address challenges that face society in the future.

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The IET Communications Policy Panel

The IET Communications Policy Panel is tasked by the Institution of Engineering and Technology with proactively identifying policy issues applicable to the communications sector and providing guidance to the IET Board of Trustees, members, Government and the public. Its members are Chief Technologists and their equivalents from across industry, academia and public sector organisations.

The panel conducts most of its business electronically but meets with selected guests a few times a year at the IET in Savoy Place to review key topics. Some of these discussions form the basis for the annual meeting.

For more information please visit http://www.theiet.org/policy/panels/

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Engineering the future of communication

‘A communicating economy’

The pace of change both in business and society, as a result of the increasing adoption of the internet as a means of communications, is continuing to impact lives and economies on both a personal and a global scale. These advances will continue apace, generating change and innovations that are difficult to predict and which sometimes lead to step changes in the way we conduct our lives. One of the most significant changes is the increase in the use of broadband to receive video and broadcast content, rather than the traditional satellite and terrestrial services. This is below the radar to many, but is another example of the revolution in way we receive news and entertainment.

The purpose of this event is not only to provide an occasion for stimulating conversation over a pleasant lunch but to let you hear from top experts in the engineering profession about recent and likely future developments in communications and have the opportunity to participate in a discussion of the likely consequences of these developments. This is the fourth in a series of annual meetings at which progress in communications is being monitored and we will again make sure that there is plenty of time for discussion.

Lord Broers
Chairman’s introduction

A connected economy is more than Broadband networks.

This year, in the fourth of our annual updates on the future and impact of communications technology we are broadening our focus to encompass the convergence between what communications does and the opportunities it creates for users and ‘content’ generators, and most sectors of the wider economy.

As pointed out in the House of Lords report on broadband communications the reach and capacity of internet-style communications is still rising rapidly. The impact of this on the wider economy, particularly the ‘e-economy’ in which the UK leads, is already significant and within a decade will be revolutionary. Businesses of all kinds, from video and broadcasting through insurance and health will be changed fundamentally, offering both a challenge and an opportunity the scale of which has yet to be sufficiently appreciated.

To set off the discussion we have three short presentations by panel experts:

- The wider context and 10-year vision based on the House of Lords broadband report
- The impact of IP communications on the video content across sectors including ‘broadcast’
- The capacity of communications technology to promote innovation, competitiveness and growth

This will be followed by a Q&A and discussion session in which you are all invited to participate - you are all users of communications.

Prof Will Stewart FREng CEng MIET FInstP
A 10-year vision based on the House of Lords broadband report
Stephen Temple, CBE MSc CEng FIET

The House of Lords report on broadband is packed with ideas and the most demanding are those that are challenging established ideas. The IET would like to rise to this challenge with a response to the report from the perspective of professional engineers:

Firstly we see a storm of convergent opportunities. The drivers include a relentless rise in data coming out of the home, the spectacular rise in TV/video content on the Internet and ever-rising picture definitions. These changes sit on top of the huge on-going improvements to broadband network performance. The inevitable disruption may well destabilise the industries as well as creating new opportunities. A particular issue is likely to be the lack of full alignment between the commercial beneficiaries of these changes and those bearing the network costs.

The trick will be resolving the objectives of creating certainty to attract long term investment (stable regulation) with harnessing these forces of disruption (innovation) that are likely to overtake whatever gets put in place.

Secondly we need to focus on how policy makers can best maximise the benefits from the relentless change in broadband network technology performance. We believe that the most crucial step is to have some vision of the effects on the wider economy; what will we use broadband for a decade from today? What will the networks look like 30 years from now? The House of Lords report provides us with some glimpses of each home having its own separate fibre to the local exchange with symmetric data rates. What will we be doing with it?

The IET is keen to work with Ministers, Parliamentarians and Officials to flesh out a model of the end vision of a broadband network…even if that vision may be a decade off in practical implementation terms.

Thirdly we think it vital to underline that the broadband internet is quite different and far more diverse in nature than traditional communications infrastructures such as telephone or TV. With a TV network we treat the UK as a single market and platform, whereas today the consumer broadband market is intrinsically three separate markets defined by the choice of network infrastructure (2, 1 or none).
This distinction is clearly recognised in the attention devoted to rural areas where government support is needed.

There are two key takeaways from this. The first is that diverse markets will need diverse policy approaches as waves of technology change arrive and need to be successfully rolled out across the country through to 2020 and beyond. This is essential if the UK is to have a broadband network that is to remain both internationally competitive and internally inclusive.

The second take-away is that the public support for the last 10% will continue to be needed beyond 2015 to maintain their social economic access. An estimate of £1.5 billion of new support up to 2020 for this last 10% would be reasonable estimate.
The impact of IP communications on media and broadcasting
Naomi Climer, CEng FIET

In the year that has passed since the topic of IPTV was introduced by the IET to the House of Lords, the landscape has already changed significantly. In the past year:

- The sales of IP capable TVs, Blu-Ray discs, games consoles and other set top boxes have steadily increased the number of households with access to video over IP on their TV set.
- The sales of tablet PCs such as the iPad has given millions of people access to a connected high quality video device.
- The incredible market penetration and increasing capability of smartphones to access video has exceeded expectations.
- Cloud computing has also passed the ‘hype’ phase and moved into reality with more people using cloud services which give them access to video content via broadband wherever they are. This ranges from photos and home videos to music and movies through services such as Apple TV, Ultraviolet, iTunes, Youtube, Netflix or Dropbox.
- The demand for higher quality services (such as HD and 4K) as the quality and size of screens increases is putting more demands on the broadband infrastructure.
- The joint venture ‘YouView’ has soft launched, with the potential to present a user-friendly, highly demanded service to UK consumers, much as iPlayer did when it first came out.
- It is no longer a novelty to watch good quality video on any device inside or outside the home - it has become a routine part of many lifestyles.

This raises many issues for consideration, but two key ones are:

**Regulation** - video content served over IP could be coming from anywhere in the world. What are the regulatory issues in terms of international cooperation, how to explain to consumers if only some of the services on their TV are regulated, how to justify the regulation to some UK broadcasters if the same rules do not apply to other services being offered side by side with them, how to protect against piracy etc.

**UK plc Infrastructure** - the heavy and rapidly increasing demands on the broadband infrastructure as a result of heavy video usage have the potential to cause issues for the infrastructure that government and businesses are increasingly depending on if the impact of iptv is not well understood. During the Olympics, the BBC broadcast all events on multiple channels for the UK audiences which gave UK citizens a bandwidth
efficient way to view or record any event. In the US, relatively few events were covered with all other events being offered via the internet. The resulting heavy use of video streaming of Olympics video over the internet for massive numbers of users caused nationwide broadband issues with an estimated average of 40% of available national bandwidth being used for Olympics viewing. Some businesses reported enterprise wide network failures because of the number of staff streaming video to their desktops during the games. Although the systems mostly coped, it is interesting to see how a single event had such a material impact on a core ‘utility’.
Communication technology - building innovation
David Cleevely, CEng FREng FIET

The capacity of communications technology to promote innovation, competitiveness and growth

Economists identify General Purpose Technologies as advances which act as platforms for long run innovation and economic growth. The UK in the 18th and 19th Centuries contributed more than its fair share of GPTs - such as the steam engine, factories and the railways. The results are with us even today.

To understand the importance of a GPT, consider printing. It brought about sharing of knowledge and innovation on a scale never seen before in economics and politics: the pamphlets of the Civil War were harbingers of massive changes in government, society and the economy just as tweets and facebook postings are today.

With the perspective of history, we can see a number of important features of GPTs:

- The places where they get used first tend to enjoy long lasting benefits (and laggards seem always to be one step behind)
- They spawn a host of innovations, many of which were not foreseen
- Experimentation, industry standards, competition and the availability of capital accelerate the exploitation of a GPT
- They lead to economic growth - economists estimate that 85% of growth is due to technology and associated process innovation
- They change the balance of power - both within and between societies

Communications - the internet, and its implementation as fibre broadband and mobile broadband networks - is a GPT with far reaching impacts. We need to ensure we are creating the right environment for innovation based on this GPT to flourish:

- Ubiquitous access for the whole country
- Open standards and data
- Support for clusters such as Cambridge and Tech City
- Improving access to capital
- Using regulation and procurement to promote innovation in business models and technology
Some economists warn that we are facing a long period of slow growth and poor productivity improvements. Yet all around us we can see fixed and mobile broadband internet has had a profound impact on our economy, our society and our political organisations. It underpins manufacturing, logistics, retail, biotechnology, tourism, entertainment, defence, education and health. We need to recognise the capacity of communications technology to promote innovation, competitiveness and growth and act accordingly.