



RTT TECHNOLOGY TOPIC
October 2009

Universal Broadband Access
The New Wireless Economy?

Universal Broadband Access - the new wireless economy?

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This month's topic examines the technology and engineering economics of universal broadband access, drawing on three presentations made at a recent Cambridge Wireless event, 'Spectrum and the New Economy'.

The presentation from [Plum Consulting 'The Economics of Broadband Access'](#) discusses the underlying economics of providing universal broadband access in developed and emerging economies.

The presentation from [Iceni Mobile, 'The New Service Economy- developed versus emerging market opportunities'](#) analyses the role that mobile phones can play in the economic transformation of 'survival economies' and case studies the use of SIM based SMS for micro finance. Iceni couple the application with a low cost base station to provide rural voice and data access.

The presentation from [The Mobile World](#) on '[Operator Capitalisation](#)' highlights the problems of over supply in developed markets, how and why emerging and survival economy markets deliver returns which are not factored in to present market valuations, how and why governmental and regulatory intervention often results in outcomes that are the opposite of those intended.

We use these presentations to suggest that universal broadband investment funds might be better spent on providing **universal narrow band access** to people living in **survival economies**, delivering a net gain to all involved parties.

Universal Broadband Access – opportunity or obligation?

The Digital Britain Report published earlier this summer in the UK justified broadband investment as a pre condition for economic and social progress.

The thinking in the report is not unique but reflects a global debate on the contribution that broadband connectivity is expected to make to developed and emerging economies.

Irrespective of whether broadband is delivered over fibre, cable, copper or wireless or any mix of these, it comes with a high price attached.

From an industrial policy perspective, the provision of broadband connectivity is an obvious business opportunity but only if the technology and engineering economics make sense. If the technology and engineering economics do not make sense it

becomes an expensive obligation.

The issue of course is whether wireless is more or less economically efficient as a delivery platform when compared with other options including fibre to the curb and fibre to the home.

This is in turn dependent on the definition of broadband both in terms of average and peak data rates and contention ratios, the demographics and topology of the country into which broadband is being deployed and the efficiency with which wireless is integrated technically and commercially with other delivery options.

For example fibre arrived in our street last week as an upgrade to the existing cable network and we were duly leafleted with the offer of 50 M/bit broadband, all you can eat TV and telephone connectivity at £50 per month.

Problematically for the fibre supplier we have acceptable ADSL2 connectivity and minimal appetite for all you can eat TV already adequately supplied without a subscription fee via a £100 Freesat satellite receiver which we fully own.

This highlights that even in urban areas in developed economies (the UK can just about still claim to be a developed economy) the time taken to achieve a return on broadband connectivity investment may not be consistent with short or long term shareholder expectation. Local zoning restrictions preclude cellular as a broadband access option even if we needed it which we don't.

Anyway the Australian government has decided the Australian nation should have its own national broadband network delivering 100 M/bit fibre to 90% of the population over the next eight years. The cost is an estimated 43 billion dollars – [Australia's largest ever infrastructure project](#).

The proposed funding is made up of an initial government investment of 4.7 billion dollars with the balance as a mix of 51% government bonds and 49% private funding. It is claimed that the scheme will create 37,000 jobs.

The cost equates to a public funding investment per household of 1650 Euros. New Zealand has a similar programme that equates to 600 Euros per household. The present UK national commitment is three Euros.

Whether the Australian and New Zealand initiatives prove to be either economically efficient or politically popular will likely depend on how much of the promised funding materializes within the political election cycle and how well it is spent.

These projects are perhaps better attempted in command and control economies with a more deterministic political purpose. Singapore for example has a government plan to spend 500 Euros per household and it can be imagined that failure there will not be an option.

The justification for these investments is based on an expectation of improved industrial, social and political efficiency with additional benefits such as lower carbon emission based on an assumption that the need to travel will reduce.

The underlying argument is that emerging economies need broadband in order to become developed economies and developed economies need broadband in order to remain internationally competitive.

The combined investment however is likely to be in the order of hundreds of billions of dollars and it is fair to question whether a better overall return could be realized by providing connectivity to bottom end rather than middle (emerging) or top end (developed) economies.

[The Mobile World](#) forecasts that there will be 4.5 billion subscribers world wide by the end of 2009 and 100% global penetration by 2015. The prospects for the bottom end of the global economy are therefore of direct interest and relevance.

Universal Narrowband Access in Survival Economies

A bottom end economy is a survival economy in which the average annual wage is less than ten dollars per day (\$3260 dollars per year). Emerging economies have incomes between \$3260 and \$20,000. Developed Countries have median incomes greater than \$20,000. ([World Resources Institute](#)).

Day to day life in survival economies is dominated by the need to find food, water and shelter.

Many of the four billion people trapped in survival economies do not have bank accounts and have no way to exchange goods and services other than through basic bartering or cash which can be dangerous to handle.

When a natural disaster happens, survival economies are dependent on food aid brought in by overseas agencies by truck or air. The cost per calorie of this food aid once administration, transport and security costs are included is ridiculously high.

A scheme in Kenya has proved to be remarkably effective at resolving some of these issues. People are given or buy at an affordable cost mobile phones with a SIM based SMS application that allows money to be transferred to and from other phones.

For example a Kenyan working abroad can transfer money to his or her mother at home. The mother then goes to a local agent to collect cash or use the credit to buy food or provisions. The mobile phone performs the same function as a bank account but without the transaction cost overhead.

Five years from start up, there are over eight million registered users performing two million transactions per day. Reuters has calculated that by February this year SMS based microfinance transactions accounted for over 10% of Kenyan GDP administered through a network of 10,000 local agents. Transaction volume is presently doubling every four months.

The host operator, Safaricom, enjoys low churn rates and income from six million SMS messages a day. The publicity from the scheme helped with a recent stock exchange flotation which included a significant percentage of small shareholders to whom Safaricom has just sent a five dollar dividend by SMS transfer – a transaction

which would have been uneconomic using traditional banking.

From a user perspective menu prompts are in English or Swahili. An unexpected side benefit of the project has been to increase basic literacy, numeracy and memory skills (Remembering a PIN number).

In the post election riots subscribers were encouraged by Safaricom to share pre pay credit in order to keep communication going. The riots meant that substantial food aid had to be brought in. The distribution of aid as cash instead of food parcels was piloted with SIMS issued to families who were then sent small amounts of money to allow them to buy food and supplies.

This reduced the cost per calorie and targeting the aid where most needed. The process also helped to establish local supply chains and sustain the local economy.

A similar initiative is now under way in Afghanistan where recent events suggest there may be other applications that could be usefully developed

For example it is sobering to consider that [the cost of providing international observers](#) in the Afghan election has been estimated at \$300 million dollars.

This does not include the loss of life that occurred and the political cost of evidential fraud.

Spending this money on mobile phones and mobile infrastructure to enable voters to vote by phone could be a viable alternative for elections in countries with limited democratic experience and would deliver the added benefit of a sustainable micro economy on the Kenyan model.

Healthcare is an additional potential application based on the integration of M Health and M Wealth (poverty eradication using access technology).

Universal Narrowband Access in Survival Economies – the impact on developed and emerging economies

So if we diverted universal broadband infrastructure spending in developed and emerging economies and invested the equivalent amount, several hundred billion dollars, into universal **narrowband** access in survival economies what would happen?

We would suggest that globally there would be a net social, political and economic gain.

Survival economies would move more rapidly to become emerging economies in turn creating new markets for the developed world to serve.

In the wireless telecoms economy it is evident that profits in saturated developed economies are flat at best. Being forced into meeting universal broadband access obligations by wireless or other means will introduce additional cost and minimal profit. It is plausible that the taxpayer will absorb some of this investment pain but this hardly seems credible in today's international political climate.

Given the growing interdependency of countries around the world it seems odd that the potential for survival economies to be the new engine of global social, political and economic progress has been largely ignored.

Partly this may be due to fear of the unknown. For example there is an argument that suggests that growth in emerging and survival economies will trigger large increases in carbon emissions. There are equally strong counter arguments to suggest this would not happen and that other positive metrics would outweigh any related carbon risk. Economic growth and a low carbon economy do not need to be mutually exclusive.

Note also that survival economies are not geographically specific and can be found within developed and emerging economies. Over 70 million Americans do not have a bank account.

Summary – the new wireless economy in a new political age?

The present political enthusiasm for broadband connectivity investment may be misplaced and is certainly too rooted in nationalistic competitive ambition,

In a closely coupled global economy, future profits and business opportunity will be dependent on how well emerging countries perform and how fast survival economies can become emerging economies.

Fortuitously it would appear that mobile phones and mobile networks are important and perhaps essential to this transformation process.

We may be witnessing the birth of a new age of truly international growth and prosperity with the telecoms industry as a facilitator of global social, political and economic progress - the new wireless telecom economy.

Cellular 25 – a major event organised by the industry for the industry

Economic growth and prosperity is a function of our ability to reinvent the future, a process sometimes tritely described as ‘thought leadership’.

On January 21st the cellular industry marked the twenty fifth anniversary of cellular in the UK with a series of thought provoking talks from ten of the most senior chief technology officers in the industry. The event was held at the Science Museum in Kensington.

The presentations made at the event are available [here](#)

Photographs taken at the event are available [here](#)

The Museum is marking their anniversary by announcing a major project to build a new gallery, ‘**The Making of Modern Communications**’ dedicated to the transformational role of Communications and Computing in the past, present and future.

The gallery will be similar in scale and ambition to the existing ‘Making The Modern

World' gallery with a similar narrative approach and educational and inspirational ambition. Proceeds from '[Cellular 25](#)' will be going towards this worthwhile initiative.

Cambridge Wireless are providing administrative and logistical support for the event - follow this [LINK](#) for a full agenda and information on ticket availability.

About RTT Technology Topics

RTT Technology Topics reflect areas of research that we are presently working on.

We aim to introduce new terminology and new ideas to clarify present and future technology and business issues.

Do pass these Technology Topics on to your colleagues, encourage them to join our [Push List](#) and respond with comments.

Contact RTT

[RTT](#), the [Shosteck Group](#) and [The Mobile World](#) are presently working on a number of research and forecasting projects in the cellular, two way radio, satellite and broadcasting industry.

If you would like more information on this work then please contact

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