



spring 2009 issue

Perspective

Challenge & Opportunity



The recent economic upheaval has focused governments the world over on how to address their immediate problems whilst also addressing the need to build a sustainable future. Old assumptions have been challenged and an open field for new thinking exists ... to some degree, at least.

Common ground seems to have emerged in at least two fundamental aspects – the importance of ‘green’ and the transition to a digital economy. Both issues have been significantly escalated on the political agendas, evidenced for example by federal CO₂ regulation in the US and ‘Digital Britain’ in the UK (see page 2).

Like governments, the telecom industry also faces both challenge and opportunity. The short term challenge is that some companies face cuts in R&D budgets and headcount, whilst paradoxically the strategic opportunities position R&D capability as key to realising the digital economy. Many companies recognise the value of access to VCE’s annual £2m+ industry-steered research, to augment their in-house capability, at an annual subscription of less than £50k. As the article on the back page conveys, shared electives can allow companies to maintain research which would otherwise fall outside reduced budgets.

Many industry members place equally high value on the strategic direction and content of the research and the value of a strong industry voice in advocating the importance of R&D, both within their own companies and to their governments. Opportunities sometimes come through challenges.

Dr Walter Tuttlebee *Chief Executive*

Research Core 5



Enabling the Digital Future: Building Research Momentum

‘Enabling the Digital Future’ was the subtitle of the 2020 Vision paper, developed by Mobile VCE’s industry membership to shape its new Core 5 research programme.

Prior to considering technology, environmental factors influencing industry evolution were explored – issues such as energy, population, demographics and economics. Building on these, through an Industry Futures Day and through embryonic industry steering groups, the emergent factors facing the industry were identified, in turn influencing and identifying the key research priorities. Today, in the light of subsequent global developments, the programme looks remarkably fit for purpose, focussing on technology solutions to deliver energy reduction and other key enablers for the digital economy.

Hosted at the Government’s conference facility in Westminster, and chaired by



Vodafone, the public industry launch of the programme took place in London in February, on the Friday after the Mobile World Congress, with an attendance approaching 100 Mobile VCE members and guests. David Hendon of BERR represented Lord Stephen Carter and spoke from his experience, and from the heart, of Mobile VCE’s contribution to the industry.

Continued on page 2



Digital Britain

How times change – not only with the economy but also national priorities. When Mobile VCE led industry missions in 2004 and 2007 to Korea to learn about IT8-3-9, their Minister for Information and Communications was Dae-Je Chin, a Samsung industry veteran.

Appointed by the Prime Minister in October, the UK has a new Minister for Communications, Media & Culture, Lord Stephen Carter, previously CEO of a telecoms and media company, leading a major new national initiative, Digital Britain.



Lord Stephen Carter

The Digital Britain Interim Report was published in February, to which Mobile VCE has responded, alongside many other companies and organisations. The Mobile VCE response, available on the Digital Britain website, speaks from its areas of proven strength and expertise, advocating the importance of R&D and its pullthrough in achieving the initiative's longer term strategic goals.

A Digital Britain Summit was held mid-April, a by-invitation event, at which Gordon Brown clearly articulated the potential for our members' technologies to transform other industries and business models, to create the future digital economy. Attending this event on behalf of Mobile VCE, its Chairman Keith Baughan observed "This initiative implicitly acknowledges the potential envisioned for the industry by Mobile VCE when it was first created more than a decade ago. As a Board of Directors, we are pleased to be engaged in the process, and recognised as having a

valuable voice at the discussion table. This UK initiative offers substantial opportunities to our industry members, both in the UK and worldwide. New business models and testbeds pioneered in the UK can be used at home by inward investors and deployed in their own export markets".

The final Digital Britain report is due late Spring – then the real work of turning potential into reality begins.

www.mobilevce.com/digitalbritain

Remotely green...

Communication tools for member participation

Embracing the philosophy of our own programmes means Mobile VCE is experimenting with new communication tools.

In autumn 2008 we began trialling Webex, as a means for overseas participants to attend Industry Steering Group meetings, extending this in March/April 2009 to all three Core 5 areas. Easy recording of synchronised audio, slides and video promises to offer an enhancement over our current capability. Overseas staff wishing to attend a Steering Group via Webex should please contact the relevant Industry Chairman (see bottom right of this page).

In February Mobile VCE spoke at a conference in Tokyo – but rather than flying to Japan, a combination of Webex and Skype Video allowed us to present and participate in a panel session remotely. We have also begun using Skype Video for face to face telemeetings with industry members (where corporate firewalls permit).

If you are truly at the bleeding edge, you can also keep up to date with Mobile VCE via Twitter. Whilst not yet 'tweeting' on a daily (or even weekly) basis, we are pleased to have found some colleagues already in Twitterspace. If you have an account, please follow us @ [mobilevce](https://twitter.com/mobilevce).



Continued from page 1

Enabling the Digital Future: Building Research Momentum

Ed Candy of Hutchison (see page 3) shared the 'big picture' 2020 vision, and the way this had been developed. This was followed by presentations on the three research streams by the respective Industry Steering Group Chairmen - Simon Fletcher of NEC (Green Radio), Mick Wilson of Fujitsu (Flexible Networks), and Jason Williams of Orange (User Interactions). The importance and value of top quality, industry-led, research was described, from complementary perspectives, in talks by David Delpy and Walter Tuttlebee, CEOs of EPSRC and Mobile VCE respectively.

Talks from the launch event are available at www.mobilevce.com/c5launch

Industry Steering Groups met during March and April 2009, and considerable momentum is now building in all research areas. New faces from existing member companies are participating, particularly in the User Interactions programme, which has attracted significant new engagement and overseas participation. In April a Green Radio Education Day, with primarily industrial speakers, took place, aimed at bringing industrials and academics to a common level of understanding. A pan-area Context event, a Scenarios (Networks) Workshop and other activities are planned for May and June (see Upcoming Events on back page).

Strong industrial leadership is key to the success of Mobile VCE's research. New attendees from member companies continue to be very welcome at all the Industry Steering Groups and other events. Please contact the relevant Industrial Chairman – their contact details are available on the one page research summaries available for download at:

www.mobilevce.com/greenradio

www.mobilevce.com/networks

www.mobilevce.com/user

www.mobilevce.com/instantknowledge

Around the World

The important role of the UK in international telecoms research has been recognised and reinforced by two substantial investments in recent months, with both Chinese and Indian Governments establishing joint programmes with the UK. Mobile VCE Universities are playing a key role in both cases, creating opportunities for our industry members, building on VCE's existing overseas links.

■ **China:** The UK-China Science Bridge in 4G Wireless formalises our connections with the Universities that have led the Chinese FuTURE research. Mobile VCE has extended its existing MoU with the Shanghai Research Centre in Wireless Comms; each organisation will facilitate industrial engagement in their respective countries. Activities start summer 2009 with a joint workshop in Beijing, and visits to Chinese Universities and companies.

Industrial members wishing to join the visit to China are invited to contact the Mobile VCE office.

■ **India:** The UK-India Centre of Excellence in Next Generation Networks, Systems & Services has seen involvement on the UK side from Surrey University in particular, who will be linking their campus-wide wireless testbed with a counterpart facility at IIT Madras. Surrey has also recently received an additional £4m EPSRC KTA funding which will allow them to work with our industrial members to extend their testbed capabilities to 4G and beyond, allowing advanced end-to-end experimentation with the latest and emerging protocols

■ **Japan:** In February the University of Tokyo invited Mobile VCE's Chief Executive to speak at its conference "Future ICT Oriented Society – dialogue and cooperation among government, industry and university". Opened by Mr. Toru Yamauchi (Cabinet Secretariat, IT Policy Office), the conference featured

talks from NTT DoCoMo, UQ Communications and Juhan Part, Estonia's Minister for Economic Affairs & Communications (and former Prime Minister); Estonia has one the world's most advanced deployments of IT for public service delivery.

Separately, Mobile VCE is currently exploring the possibility of some 3-9 month researcher secondments to Japan over the coming year under a scheme funded by the Japan Society for the Promotion of Science.



■ **USA:** In April, the SDR Forum came to Madrid and learnt about Mobile VCE's research, including Cognitive Radio, undertaken within its Delivery Efficiency Programme. The SDR Forum has been a longstanding MoU partner of Mobile VCE and the opportunity was taken to discuss possible new joint initiatives.

■ **Europe:** In February the industry converged in Barcelona for the Mobile World Congress. Mobile VCE was invited to share views on the future of the industry as part of a panel organised by Mobile Monday (MoMo).



Lord Davies of Abersoch opens the MoMo panel in Barcelona

In May, the 'Wireless@VCE' event was kindly hosted in Paris by France Telecom. Many of our industry members have research labs in continental Europe, and this event allowed them to hear the achievements of the Delivery Efficiency programme and the goals of Green Radio. The event was timed to precede the spring WWRF meeting, to allow attendance of research staff from Asian and American member companies.

www.mobilevce.com/paris

Ed Candy Hutchison

■ **Ed – you initiated Europe's 3G research in the 1980s, you have implemented it in commercial networks, and you are still looking to the future...Yes - it's been very fulfilling seeing concepts become reality, and very challenging. Research takes on a new meaning when you appreciate the constraints and demands of the commercial environment.**

■ **Hutchison arrived as a greenfield 3G operator. How did that shape its approach?** It was a challenge. I needed to coordinate the 3G network implementation and its architecture for 3 UK and the 3 Group networks which were being established around the world. It was an opportunity from the outset to introduce internet and packet techniques into mobile. We did not have a customer base, and we were not constrained by existing legacy networks and architectures. This meant we could embrace the internet ahead of many other telecom operators. The internet based X-Series and more recently the Skypephone and the INQ1, dubbed by some as the Facebook phone, are examples of that.

■ **Many did not understand those moves – how have they worked out?** It was a bold and courageous step in an industry that was locked into early digital telephony techniques. It has placed Hutchison in the lead throughout the world in making the internet mobile. The uptake by our customers has shown a real need for internet in your pocket. The early walled garden solutions were a necessary step which allowed us to move to open internet access once the technology and the handsets reached maturity. With HSPA we finally achieved the original vision which was set in place back in 1987 and the benefits of mobile broadband are now well understood and used across the mass market.

■ **Did such thinking influence your contribution to Mobile VCE's '2020 Vision'?** You mean the concept of 'IJI'? Yes. The ordinary customer wants things easy and simple – that is one way my experience in the commercial world has shaped my view of research. My vision of the future is a world where 'It Just Is' – where the user can interact effortlessly and with services oblivious of how it works. In an ever-more-complicated world, people need services to make their lives simpler and easier, and they will pay for them.

■ **When you shared your views at our Industry Futures Day they seemed to resonate with the other companies. Did that surprise you?** The challenge here was to articulate what we all implicitly desire. After all, we are all users ourselves and we encounter the same issues in our own lives. It was rewarding to see Mobile VCE's Vision Group embrace the concepts and build IJI into the industry consultation paper '2020 Vision: Enabling the Digital Future'.

■ **How does Hutchison use its relationship with Mobile VCE?** We value our membership and are currently helping steer the 'Instant Knowledge' programme – that is a very interesting service idea. As Mobile VCE's research is looking beyond LTE, that is also important to us as we continue to build a broader mobile broadband network with a growing customer base. And if Mobile VCE's researchers can truly embrace these ideas then they have an opportunity to help the industry deliver some really exciting and valuable new services in the next few years.



What research do you need today?

Mobile VCE's elective research programmes are initiated, defined, funded and directed by small groups of its member companies. 2008 saw two such programmes successfully completed, described below by their respective Industrial Chairmen.

Low Latency Ad Hoc Wireless – Ben Allen, HMGCC

Ad hoc wireless network research has attracted attention over several decades, and continues to do so. There are several operational scenarios which would benefit from a practical solution as a means of information delivery without requiring infrastructure. One specific scenario, the focus of this elective, is communications amongst emergency services personnel attending a civil disaster.



The ad-hoc demonstrator, implemented on wireless laptops

Four members of Mobile VCE - HMGCC, Turner Broadcasting, Thales and DSTL - provided technical direction, knowledge dissemination and financial leverage for this research, undertaken for them by Drs Dave Laurenson and Yuanyuan Fei at the University of Edinburgh. At the conclusion of the elective the researchers had delivered high quality and insightful conclusions relating to routing protocol performance comparison and MAC layer design issues, the central foci of the 15 month programme. The construction of a live demonstrator system further enabled routing protocol performance to be demonstrated.

Learn how to initiate an elective tailored to your company's needs, visit www.mobilevce.com/electives

Dr Fei is currently working for one of the industrial sponsors of the programme.

At time of writing, the possibility is being explored of an international conference on Ad Hoc Wireless, open to all Mobile VCE members, with a view to building upon this work in a new elective.

Fundamental Capacity Limits of Wireless Networks – Trevor Gill, Vodafone

With sponsors BBC, BT, Huawei, Nokia Siemens Networks, Nortel and Vodafone, this substantial programme tried to answer a truly fundamental question – to understand whether we can continue to expect new systems such as LTE or LTE-Advanced to deliver ever-increasing spectrum efficiency. Are we approaching a glass ceiling, or can we go on for ever squeezing more out of the raw spectrum? In the process, the team at Surrey has developed analytic formulations for the capacity of realistic cellular networks and extended the work to consider less regular networks, such as might be made up of randomly positioned access points (eg wireless cities).

The work has shown that cooperation of base stations could enable a substantial leap forward in capacity. On the uplink, given enough backhaul and processing power, there is considerable scope to increase capacity by decreasing cell size, as the fundamental limit is a Shannon-like function of the total power received at each base station. Real gains will be limited by processing power and RF components. In principle, the same approach can be mirrored on the downlink, but the catch is that prior knowledge of the downlink channel is necessary to be able to pre-code the transmitted signals to reduce interference. The work has given some signposts to the substantial problems that will need to be solved to apply these concepts in real systems.

Research Pullthrough & IPR

'Research Pullthrough & IPR Exploitation' was the title of an industrial members' workshop held in London in April. Briefing papers and presentations are available for member download at the link below.

Instigated by the Board of Mobile VCE, the event was structured into four sessions. The first described the UK government's new £36m investment in Digital Economy Research Hubs and the opportunity for industrial steering. The second described new funding available for taking prior VCE research into prototypes and demonstrators, seeking industry prioritisation of the opportunities. The third described the work of Camitri and how the company might be able to assist Mobile VCE's member companies. The final session explored an outline proposal for an Innovation Venture Scheme.

Short presentations from

EPSRC, TSB, Camitri and others, were followed by extensive Q&A and discussion in all four sessions, prior to a closed, member-only debate at the end of the day.

The afternoon provided a useful precursor to the bi-annual Patent Portfolio Review, which will take place this June. A summary was presented of the Patent Casebook, which currently comprises 57 active cases (patent families). 50 of these are assessed as having 'high' or 'good' commercial value and 32 have achieved grant status in various jurisdictions. The Patent Casebook forms one of the Briefing Papers available to members via the link below.

Companies who missed the event but who wish to participate in an industry working group on such issues and / or in this summer's Portfolio Review, are invited to contact the Mobile VCE office.

More Info:
www.mobilevce.com/pullthro

Upcoming Events

Dates or venues may change - please check the Calendar Page of the Mobile VCE website – www.mobilevce.com – to confirm. Events are normally open to all staff from any industrial member company; registration is usually required and may be done directly from the Calendar Page.

2009

May 4th Wireless Research from Mobile VCE - Wireless Efficiency & Green Radio - France Telecom, Paris

May 12th User Interactions Scenario Workshop - University of Bristol

May 14th 'Context in Context' - Research Workshop - Vodafone, London

June 11th Industry Steering Group - Core 4 Instant Knowledge - Royal Holloway University of London

June 22nd - 23rd Researchers' Conference - kindly hosted by Thales - Reading

June 24th Industry Steering Group - Core 5 Flexible Networks - Fujitsu Labs, Hayes, Middlesex

June 25th Industry Steering Group - Core 5 User Interactions for Breakthrough Services - London School of Economics

July 2nd Industry Steering Group - Core 5 Green Radio - Kings College London

July 25th Visit to China (2 weeks) - Industry & Academic - Workshop in Beijing, Visits to FuTURE Universities and Industry in Beijing, Shanghai et al

September 4th Industry Steering Group - Core 4 Instant Knowledge

September 9th Green Radio Metrics Workshop - University of Swansea

September 17th Industry Steering Group - Core 5 User Interactions for Breakthrough Services - University of Bath

September 30th Industry Steering Group - Core 5 Flexible Networks

October 1st Industry Steering Group - Core 5 Green Radio - University of Edinburgh

October 8th Annual General Meeting (am) - & Research Review (pm) - RSA, London

Details of monthly Coordination Steering Group teleconferences and of other ad hoc meetings for each research theme are available from the relevant Industry Steering Group Chairman or relevant pages within the members' area of the Mobile VCE website.

Mobile VCE is a not-for-profit company which undertakes world class long term research for the global communications industry utilising the UK's leading academic research teams.

It is supported in this by the UK government acting through the Engineering and Physical Sciences Research Council (EPSRC) and the Technology Strategy Board (TSB), whose support is gratefully acknowledged.