**Technology Ireland**

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A positive economic outcome for our country will depend on the right attitude, people and world-class technology, writes CTVR director **Donal O'Mahony**

Given that the current economic crisis is of a kind that none of us has experienced before and that scarcely a day passes without announcement of redundancies, salary cuts, factory closures and gloomy forecasts for the next year, I feel we need to pay more attention to possible, practical solutions to overcome the problems that Ireland faces.

The questions that need to be answered are:

- What role can indigenous industry play in reviving the local economy?
- How the can the Government continue to back early-stage enterprises in the midst of the current climate? And,
- How can we position Ireland as an attractive place for industrial heavy-weight companies looking for somewhere to engage in high-tech, high-value activities?

I am director of the Centre for Telecommunications Value-Chain Research, (CTVR) based at Trinity College Dublin, one of currently nine sector-specific 'Centres for Science, Technology and Engineering' (CSETs) that were established across the country to develop world-class expertise for indigenous start-up companies as well as the multi-national technology giants that we want based in this country.

The CTVR was established to work on the engineering and science challenges that will impact on the telecommunications sector of the future.

It was set up in 2004 as part of a State initiative that saw the establishment of the *Bell Labs* research centre in Blanchardstown, Dublin. The CTVR is geared to attract heavyweight global technology firms to Ireland and also to encourage the commercialisation of high-tech research among indigenous companies. In light of disasters that have recently befallen the Irish technology sector – in particular, the challenges faced by *Dell* in Limerick – it's worth exploring the role of the CTVR.

**REPUTATION** The CTVR is a joint venture between the Irish university sector and a number of industrial partners including *Bell Labs*. Having built up a team of more than 100 researchers from eight Irish universities, a big part of our role is to develop Ireland's reputation overseas as a location where top-level research is done in the technologies such as optical networking, advance mobile-phone systems and radar imaging technology.

This reputation-building process yielded early results when the CTVR worked with government agencies such as the IDA to help the senior *Xilinx* personnel to set up its *Xilinx* Research Lab in Dublin in 2005. This was the first time that *Xilinx* had located a research lab operation of this nature outside of the US. To staff the €7.5 million facility, the firm hired a number of PhD and Masters-holders as researchers and engineers, which represented an important endorsement of the high-tech research talent in this country. Since opening in 2005, the research lab has engaged in collaborative research work with other academic and commercial research centres. The significance of this kind of collaboration is that it may help drive major technological breakthroughs, which in turn could lead to significant commercial and economic benefits.

In the current circumstances, this reputation-building is critical to position Ireland as a place offering high-quality research opportunities and an available workforce. Since we first opened for business, CTVR personnel have published over 400 research papers in international journals on a range of topics, from telecommunications infrastructure technologies to electro-magnetic spectrum use. Every time one of us speaks at a conference or contributes a paper to an international publication, we are effectively selling 'Ireland Inc' overseas.

**PEOPLE** In the last year, these efforts have begun to bear further dividends, with an enhanced level of awareness among academics, industry and investors of the CTVR as a place where talented people are exploring important ideas, and of Ireland's value as a location for high quality, high impact, industry-based research.

We have also worked closely with the multi-national ICT community to establish high-level research partnerships, geared towards ultimately producing commercially viable products and services.

In December 2008, a team of CTVR researchers began collaborating with *IBM* on the development of a new optical network that may form a crucial part of the next generation of 'supercomputers' to be designed by the multi-national. We also last year entered into a partnership with *NEC Communication Systems, Ltd. (NCOS)*, part of

Japanese technology giant *NEC Group*, and focused on the emerging area of all-optical networking, the fast internet core that will be essential to support the billions of future users of applications like *Facebook* and *Youtube* and in business to support the trend towards cloud computing. This will allow huge savings in the cost of devices and in the power that is consumed by core network equipment today. The net effect of this will be to lower IT costs for business which are engaged in the networked economy.

Going forward, one of the most important elements of our work will to help create the human capital - the people with the training, the focus and the creativity - that will spur innovation in the telecoms/IT space. The exposure to a range of different disciplines, and the close links with industry, means that we have already graduated 14 PhDs, with another 39 in the pipeline.

On the basis that the best can encourage the brightest and vice versa, we have actively sought to create a genuinely international and inter-disciplinary atmosphere. Our researchers come from a range of academic and professional disciplines, and more than half are overseas nationals, some from as far away as India and Japan.

But this is just the first step. We then need to engage these people, both Irish and foreign, in an eco-system – made up of top quality research centres, high-tech start-ups, progressive SMEs and world leading global companies – that is definably Irish. In turn, this will allow them to transform their knowledge and creativity into wealth-generating activity.

**EMERGING BUSINESS** However, one of the most fundamental measures of the CTVR is its ability to act as the catalyst for new high-tech ventures. In a pessimistic business climate, with levels of external funding and credit down compared to previous years, our ability to support start-ups will be crucial.

We have already overseen the creation of one high-tech spin-out firm, *Socowave*, which specialises in radio-array antenna solutions. At least three other similar ventures are in the pipeline. Over the next 2-3 years, as we battle to recover from the current economic woes, we plan to help other spin-out firms, in the areas of energy management modeling systems, optical switch-router devices and amplifiers for wireless base stations.

One current example involves the commercialisation of software radio - i.e. software that can be used to offer radio functionality. This is of significant interest for technology companies who are looking to develop radio-based devices that depart from standard product norms.

Right now, we are in the process of setting up a campus company which will license the software, support other, larger firms to incorporate it into potential products and undertake bespoke developments of the software, as required. Even in advance of its formation, one high profile multi-national has taken out a paid license for the software.

**UNIQUELY IRISH: ROOM TO PLAY** Another element of our remit is to make the most of Ireland's natural resources, in a technology context. One instance of this is our efforts to promote Ireland's status as a potential 'spectrum playground' for global IT companies looking to carry out research experiments on new wireless technologies.

In other countries, space on the electromagnetic spectrum – the range of all possible electromagnetic frequencies used for radio communications – is relatively crowded, allowing little room for experimentation. However, as Ireland is a small country with little in the way of high-tech military activity, the radio spectrum is not nearly as congested as elsewhere.

The regulatory authority in Ireland, the Commission for Communications Regulation (ComReg), has taken a positive approach to this opportunity and - along with the CTVR - has actively promoted the possibility of spectrum experimentation in Ireland among the international research community and telecommunications industry.

The kind of opportunities that this may present was illustrated by an incident at an international conference on wireless technologies last year. As I was delivering a presentation on the possibilities offered by Ireland's 'spectrum playground', a member of the audience said: 'I think I need to move my team to Ireland. I hope our policy-makers are listening'.

The current crisis has led to brickbats being slung in every direction about who is to blame, and how the various authorities could have allowed the economy to diminish so rapidly. However, the reality of the situation is that it is now necessary for us to focus on how the problem can be solved, not on how it arose.

Promoting Ireland as an attractive location for technology multi-nationals by ensuring a supply of the best and the brightest, supporting the development of local enterprises in high value, high growth, specialised sectors and maximising the resources we have at our disposal – this is how Ireland can, and will, get itself back on the right track.

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Professor Donal O'Mahony

*Professor Donal O'Mahony is Director of the Centre for Telecommunications Value-chain Research at Trinity College Dublin.*