

# e-monitor

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**April/May 2011**

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ENGINEERS  
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## from the chair

ITEEC

**engineer.career**

Engineers Australia's  
careers website  
provides extensive  
career information.

## Lessons from history

by Peter Hitchiner



It has been a long time since I showed any empathy for Henry Ford's quote that "history is bunk". I have plenty of experience to know that history is a great teacher that we ignore at our peril. History tells us that innovation occurs through inspired leadership – inspired by history, I hope.

I had the opportunity to attend NICTA's function to formally farewell David Skellern on his retirement as CEO. David made his mark in the information, telecommunications and electronics industry through the work that led to the formation of Radiata and its world leading wireless LAN technology.

This work had been pioneered by CSIRO scientists and engineers. The breakthrough was made possible via the technology provided by fast fourier transform chips, developed originally with processing radio astronomy data in mind. The ability of the chips to process multipath wireless signals, an innovative step identified by the wireless LAN team, gave the Radiata technology the ability to realise a practical wireless LAN.

It's worth considering in the context of the emerging opportunities for the Square Kilometre Array (SKA) and what spin-off work might be applied from it to commercial telecommunications. The importance of a radio-quiet zone for leading radio astronomy is well known and challenging to achieve. Signal processing technology, developed out of the need to cancel interference to the SKA, might find application in improving the performance of wireless communications systems. Just as developments in chip technology made fast fourier transform chips a practical proposition in commercial systems, viable signal processing could be used to deliver more efficient broadband wireless.

I also had the privilege of being able to attend the memorial ceremony celebrating the life of Emeritus Professor John Bennett AO. Bennett's work at the University of Sydney, which brought him back to Australia from UK, was inspired through the School of Physics under Professor Harry Messel. Messel had recognised the importance of pioneers such as Bennett in enabling the foundation and development of computing science (and engineering) at academic institutions and the skills and research base that allow Australia to become a leader in the ICT industry.

Bennett studied in civil, electrical and mechanical engineering

and mathematics and worked on early stored program computers at Cambridge University where he was awarded a doctorate for his dissertation *Some engineering applications of digital computations*. It recognised the importance of stored program computing to engineering at an early stage.

Such leadership may continue in such areas as photonics and quantum computing in physics departments today. We cannot be leaders in all facets of ICT and electronics, but we must build on the leading skills we have to provide a foundation for future industry.

History confirms the importance of fundamental research in physics and it illustrates the essential role of engineering in delivering value out of that research. Engineers are those who are able to convert the pioneering work of physicists into practical outcomes as we have seen in the areas of wireless LANs; computer science; photonics, more recently; and perhaps soon in quantum computing.

Unfortunately, there are trends that seem to be diminishing the value of ICT and electronics training, simply because the recognition of that value does not reflect the increasingly pervasive nature of ICT and electronics in all industries. The importance of investing in training (in particular for graduate and postgraduate studies) and inspiring young people to enter ICT engineering careers is the responsibility of those who include members of the ITEE College. Please help!

This column also appears in the [ITEE College Board Chair blog](#): please post your feedback.

***Peter Hitchiner is the ITEE College Chair 2011***

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## news

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### **Providing relief power**

Volunteers from the Queensland chapter of the ITEE College of Engineers Australia and young engineering volunteers from Engineers Without Borders teamed up with Cdif Group, providing immediate flood-relief power for affected residents and organisations of the southeast Queensland suburb of Goodna.

The consulting firm set up a solar trailer to allow residents affected by power outages to charge their mobile phones and laptops and remain in contact with others. The trailer also had the ability to provide temporary street lighting, and functioned as a wireless hotspot.

The solar trailer, provided by J1-LED, ran on 12V DC. A solar regulator controlled the voltage and current supply as well as

the trailer's battery recharging rate. This then fed a 1500W inverter to provide 240V AC for domestic use. The trailer had 880Ah of battery backup and could last up to a week without sunlight under the anticipated loads. The equipment had short circuit, thermal and over current protection.

The phone chargers and 3G wireless router were installed in a waterproof compartment in the trailer. Optus World, Queen St Mall, supplied the chargers and the router.

Local state MP Jo-Ann Miller and her staff were among those who made use of the trailer after they were flooded out of their offices. Journalists from the ABC 612AM program also used the wireless capabilities of the trailer to update their Twitter feed with news on the flood as they broadcast nearby.

"The importance of having access to social media channels became prominent as a single status update could provide assurance to hundreds of friends and family that people in the crisis zone were okay," said Cdif director Bolle Borkowsky.

It served as a literal pillar of light at the Diggers Rest war memorial, at times being the only street light available in the immediate area. It kept a watchful guard over donated goods and on one occasion, according to Borkowsky, enabled staff to spot teenagers who were about to loot provisions destined for residents and volunteers.

In following the theme of Engineers Australia's Year of Humanitarian Engineering, it also highlighted the importance of links between Young Engineers Australia and Engineers Without Borders. The cooperation between the two organisations saw the trailer adequately staffed by volunteers and relief provided in the critical first-response period.



*Solar power from the trailer*

*charges mobile phones, laptops and powers a 3G wireless hotspot for internet connectivity.*

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## **Student to visit space academy**

Most students will jump at the opportunity to see where or how their thesis is applied in practice. However, for UTS environmental sciences honours graduate Emily Bathgate, those opportunities are rare given her thesis is based on searching for evidence of past water activity on Mars.

Bathgate's thesis, *Sub-ice volcanism on Mars*, examines glaciovolcanic features using data obtained from the European Space Agency's Mars Express and NASA's Mars Reconnaissance and Odyssey orbiters. Her work examines Martian parallels to geological features found in Iceland, shedding light on whether the northern hemisphere of Mars could have once hosted an ocean.

While the prospect of travelling through space to visit the red planet is slim, Bathgate will experience the next best thing. Over 10 weeks, she will work with a NASA scientist or engineer as part of the NASA Academy Program, visiting facilities such as the Jet Propulsion Laboratory, Virgin Galactic, SpaceX and the Kennedy Space Centre. The opportunity is made possible through the Victorian Space Science Education Centre-NASA Space Prize.

"I am extremely grateful and humbled by this amazing opportunity to be involved in the NASA mission by attending the Ames Academy," she said.

Bathgate will also work with the Victorian Space Science Education Centre to share her NASA experience with secondary students and teachers to inspire Australia's future scientists and engineers.

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## **Data centre reform project looks dark**

The former NSW Labor government's plan to consolidate 130 government data centres into two energy efficient data centres is looking less likely to succeed with the loss of another tenderer.

Global Switch has joined Gresham Property and Plenary Group in abandoning the tender process. Global Switch was unable to comment on its decision to withdraw from the process, citing non-disclosure agreements that are currently in place. Neither Gresham nor Plenary have provided any reason for not continuing in the process.

The remaining two companies competing for the tender are Leighton Contractors and Macquarie Capital Group. Leighton's partner in its proposal, Springfield Land Corporation, has also pulled out, leaving Leighton to go it alone. The tender process has been ongoing since October 2009. It attracted 17

respondents, five of which were shortlisted in August 2010.

Prior to its 26 March election win, the Liberal government said it would place greater emphasis on ICT developments, with the then shadow financial management minister Greg Pearce saying that ICT needs to be more front and centre for the government.

The Liberal government is not expected to halt the project, promising it would honour signed contracts. However, no contracts have been signed as the tender process has not been able to progress to that stage due to lengthy delays. The initial expressions of interest document for the tender indicated that by now construction should have been close to or completed.

The document indicated that the expected initial tenants of the data centres – NSW Health and the Department of Education and Training – have a pressing need for a new data centre. In addition, results from a 2008 review of data centres – used as the rationale for the project – showed that projected demands would significantly surpass the then level of installed data centre infrastructure.

The tender documents issued to the five short-listed tenderers have not been made available to the public. Furthermore, [The Australian](#) reported on documents obtained by the Liberal government under Freedom of Information laws in June last year during Labor's term. These documents do not appear on the Department of Services, Technology and Administration's disclosure log, nor are they being made available to the public.

e-Monitor has made several unsuccessful requests for the information and the status of the project since last December. The department has since stated that it has a blanket no-comment policy on the process. Coupled with the tenderers' silence under non-disclosure agreements, it is unknown what requirements, if any, have changed since the expression of interest documents were issued or what could have caused the companies to drop out.

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## **Creating a Pacific fibre link**

A project to link Australia, New Zealand and the USA over a high-capacity Pacific Ocean fibre link is emerging as more than just a pipe dream with Pacific Fibre inviting selected vendors to tender for a 5.12Tb/s cable that it claims will dwarf the existing Southern Cross Cable.

The proposal to build the dual-fibre pair system has attracted significant attention given the expected need for increased international capacity as Australia builds its National Broadband Network (NBN) and other nations upgrade their own networks. Pacific Fibre claims that 90% of New Zealand and Australian internet access requires international

connections and that the investment in fibre to the home initiatives such as the NBN will be futile if international bandwidth capacity does not increase.

Last July, the company signed a Memorandum of Understanding (MoU) with Asian telecommunications provider Pacnet to build the cable together. During that time, Pacific Fibre secured additional funding and expanded its staff, but news on the progress of the link had been slow.

In the meantime, significant upgrades have been undertaken by Southern Cross Cable to bring its fibre link to 1.2Tb/s. The company expects to take the cable to a capacity of 4.8Tb/s within the next two years.

The MoU with Pacnet expired earlier this year, freeing up Pacific Fibre to go to the market alone. It has invited selected vendors to tender for the construction of the link, which the company has scheduled for completion by 2013. Vendor responses are due mid-May with contract negotiations expected to commence shortly after.

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## **NBN superhighway progress hits a road bump**

The National Broadband Network Company (NBN Co) has seen a large increase in activity, matched only by the sudden unexpected halt of its construction tender and the resignation of its head of construction Patrick Flannigan. Nevertheless, planning for the massive network is continuing.

In March, the House of Representatives passed the National Broadband Network Companies Bill 2010 (NBN Companies Bill) and the Telecommunications Legislation Amendment (National Broadband Network Measures – Access Arrangements) Bill 2011 (NBN Access Arrangements Bill).

At the same time, NBN Co awarded IBM with a \$200 million, three-year contract as its prime systems integrator of its operational and business support system. These systems allow retail service providers (RSPs) to order new services, report faults, perform service qualification checks and otherwise manage their own services on the NBN.

However, not all has been smooth-sailing, with NBN Co announcing at the beginning of April that it had indefinitely suspended its network construction tender after construction companies were unable to provide acceptable terms and prices after four rounds of negotiations.

Shortly after the decision, NBN Co's head of construction Patrick Flannigan resigned.

NBN Co's pricing for retail service providers has also come under fire from Internode managing director Simon Hackett.

On the telecommunications company's blog, Hackett published a proposal set to rebalance the company's wholesale pricing model.

Hackett claims that as it currently stood, RSPs with less than 250,000 customers would effectively be priced out of the market. His proposal suggests changing the costs to move data between points of interconnect and customer sites, and the costs per customer port required to deliver 12mb/s downstream, 1mb/s upstream and voice communications.

The minister for broadband, communications and the digital economy Stephen Conroy dismissed the proposal, stating that Internode should have made a submission to the ACCC during previous consultation periods. However, Internode has made several submissions throughout the ACCC consultation process, raising the question to what extent the government reviews or considers submissions.

NBN Co took an unorthodox approach to the claims, choosing to use industry news aggregator and discussion forum Whirlpool to respond to Hackett and others' concerns over pricing.

NBN Co digital communications manager Scott Rhodie wrote that the NBN Co's wholesale prices were based on its short to mid-term expectations of data usage, but more importantly, that the company expects prices to come down once end users sign on and higher speeds are purchased.

Nevertheless, planning has continued, with NBN Co awarding Victorian IT and communications company SPATIALinfo with a multimillion dollar contract to provide software licences and product support for NBN Co's business and operational support systems. The contract is for an initial period of two years.

The first 12 RSPs have also signed on to connect to the NBN for trials at the five first release sites. Four RSPs – iiNet, Internode, iPrimus and Telstra – have already completed NBN Co's on-boarding process and are "NBN-ready". They are expected to be the first to connect mainland customers to the NBN when the end-user trial begins in Armidale.

The remaining eight RSPs – AAPT, AARNnet, Comscentre, Exetel, Nextgen Networks, Optus, Platform Networks, and SkyMesh – are now beginning the on-boarding process.

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## Taiwanese mobile network support arrives

Taiwanese communications company Huawei has revealed that it plans to set up offices in Adelaide to support the upgrade of Vodafone's mobile network infrastructure.

The upgrade will see Huawei replace 2G and 3G equipment at up to 450 of Vodafone's sites as part of a total network modernisation program. Huawei and Vodafone will also implement an additional 850MHz 3G layer across the entire Vodafone network to improve network capacity and coverage.

The company's new presence in Australia is expected to create 50 jobs for the state this year, and Huawei's total Australian existing workforce is also set to double from 300 to over 600.

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## Australian Broadband Survey

IT and telecommunications industry forum Whirlpool has released its 2011 [Australian Broadband Survey](#).

The survey was conducted over four weeks between January and February, netting 23,513 submissions, with respondents most likely to be those advising friends, family and coworkers on technology decisions. The results have not been normalised to represent the broader marketplace, with Whirlpool stating the information is more valuable with that bias intact.

Whirlpool also claims to have carefully identified and eliminated instances of ballot stuffing.

The survey reveals that about 20% of respondents had negative sentiments towards the National Broadband Network (NBN). While the responders seemed divided as to whether the government was handling the NBN well (with 7.1 percentage point difference between positive and negative responses), it was a marked improvement from last year's 15.1% positive response, with that figure rising to 42.8%.

While keeping in mind that the demographic of respondents would include early adopters, 76.2% indicated they would choose a faster speed than the minimum 12/1Mb downstream/upstream connection. 22.8% indicated they would opt for a 250/100 or faster connection.

However, 35.5% of respondents indicated they would not be willing to pay more for their desired speed. The survey notes that speed selection preferences may change once respondents have a better idea of the associated pricing.

With respect to how broadband is currently being used, the highest ranked uses were for fast downloads, always-on web access, and fast web surfing, highlighting speed as a priority.

55.5% of users downloaded TV shows/movies/music, and 45.4% used BitTorrent. Unfortunately, the survey doesn't examine what percentage of respondents use BitTorrent for downloading TV shows/movies/music. Given the correlation between the two figures and BitTorrent's typical use, it could provide interesting insight into the legitimacy of downloaded content.

Other sections of the survey include a comprehensive look at how respondents ranked their service providers and compared to historical data. Surveyed areas include the sign-up process, payment preferences, customer support, service reliability, and customer satisfaction.

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### **Building an Australian regional backbone**

In a program delivering 6000km of fibre backbone across regional Australia, two major projects were completed last month.

"Backbone infrastructure provides the communication links that connect our towns, cities and rural areas to each other and the world," federal minister for broadband, communications and the digital economy Senator Stephen Conroy said.

The 449km link between Perth to Geraldton was last month completed by Nextgen Networks. Civil engineering on the route was undertaken by Visionstream and the Ngarda Alliance. Ngarda Alliance is a WA indigenous engineering services firm specialising in civil and mining projects.

The link forms part of the federal government's \$250 million Regional Backbone Blackspots Program (RBBP).

"This link is the first building block of the National Broadband Network (NBN) in Western Australia," Conroy said.

He said WA provider Westnet, a wholly owned subsidiary of major internet service provider iiNet, is now accessing the new fibre backbone and offering faster ADSL2+ services, and cheaper prices for existing products.

Senator for Western Australia Louise Pratt said the new fibre optic link would strengthen Australia's bid to host the Square Kilometre Array (SKA) telescope. The main SKA site is proposed to be located at Murchison Observatory, 315km northeast of Geraldton. CSIRO is currently constructing a fibre optic link between the Murchison Observatory and Geraldton and the new Perth to Geraldton link will provide a high capacity link that can be used to transmit large volumes of scientific data for processing.

"The SKA will be one of the largest international science projects of the 21st century, with its primary purpose to

advance discovery-based science in the fields of astronomy and astrophysics," Pratt said.

The second project completed last month was the 146km Victor Harbor fibre backbone link in South Australia.

This section was completed by Nextgen Networks which is currently in the process of connecting retail service providers to this backbone link.

A third Victorian section of the link was also initially due for completion last month, according to information on their website, but appears to have been deferred to this month.

The route, which runs through South West Gippsland, will connect to the Melbourne carrier point of interconnect and serve nine other towns along its length.

Two more RBBP routes through Broken Hill and Darwin are scheduled for completion by the end of the year.

Nextgen and Visionstream are wholly owned by Leighton Holdings.

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## **An overview of the cyber battlefield**

A survey of 200 IT security executives from critical electricity infrastructure enterprises in 14 countries has found that 40% of executives believed that their industry's vulnerability had increased.

About 30% believed their company was not prepared for a cyberattack and more than 40% expect a major cyberattack within the next year.

The report, *In the Dark: Crucial Industries Confront Cyberattacks*, was commissioned by McAfee and produced by the Center for Strategic and International Studies. It is the follow-up to a report released in 2010, *In the Crossfire: Critical Infrastructure in the Age of Cyberwar*, which found many of the world's critical infrastructure lacked protection of their computer networks, and revealed the staggering cost and impact of cyberattacks on these networks.

According to the report, 80% of respondents have faced a large-scale distributed denial of service attack (DDoS), and 25% reported daily or weekly DDoS attacks and/or were victims of extortion through network attacks. The number of companies subject to extortion increased by 25% in the past year, and extortion cases were equally distributed among the different sectors of critical infrastructure.

Only 25% of those surveyed implemented tools to monitor network activity, and only about 36% used tools to detect role

anomalies.

China and Japan were among the countries with the highest confidence levels in the ability of current laws to prevent or deter attacks in their countries, while Brazil, France and Mexico were lagging in their security measures.

Locally, 90% of Australian respondents believed their respective sectors were not at all or not very prepared for stealthy infiltration attacks. However, as quoted in the report, Logica Australia chief information security officer Ajoy Ghosh said: "the growing sense of unpreparedness is the result of more understanding [of the threat] because of a big education effort for executives by the government".

Nevertheless, Australian respondents voiced low confidence in the ability of laws and regulations to address cyberincidents, indicating a low level of trust in authorities.

Other issues covered in the report include the global response to the Stuxnet worm, and vulnerabilities to the smart grid.

The full report is [available online](#).

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## **Tweeting a new tune**

*e-Monitor* has opened an account with Twitter to provide readers with timely updates on news and developments in the IT, telecommunications and electronics industries and matters relating to the ITEE College.

The account will also be used as a medium for feedback, listening to readers' tips and ideas, and fostering debate on issues important to *e-Monitor* readers. Readers who do not use Twitter are still invited to submit their feedback, tips and ideas via [email](#).

To join the conversation, follow [@iteemonitor](#) on Twitter.

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## Tip us off!

Do you know something the ITEE College or the IT/ telecommunications/electronics engineering industry should know? Tip us off! *e-Monitor* is on the look-out for information that would interest our readers.

Do you wish that someone in the media would cover a particular story or interest? Let *e-Monitor* know and we'll investigate.

You can submit tips, feedback, or an idea for a story via [email](#) or on [Twitter](#).

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## new products

### Uninterruptible power supply

Power management company Eaton Corporation has launched a new line-interactive uninterruptible power supply.

The 5PX features a power factor ratio of 0.9 and a power range of 1.5kVA-3kVA.

Application for the 5PX include IT devices such as servers, switchers, routers and storage devices.

Energy consumption down to the socket-group level can be monitored through the 5PX's LCD display or via the network with Eaton's power management software.

5PX's battery reliability has been improved through technology that allows the batteries to rest between charging cycles. Battery life is expected to be considerably longer, decreasing maintenance costs due to prolonged service and replacement cycle.

The 5PX employs an RT format, enabling installation in rack and tower positions.

[www.eaton.com](http://www.eaton.com)





*Energy consumption can*

*be monitored through the 5PX UPS.*

## **Stylus for tablets**

Pen tablet manufacturer Wacom has developed a new stylus designed specifically for the Apple iPad.

It offers an intuitive way to experience note-taking, sketching, drawing and other forms of creative expression on the popular iPad.

The Bamboo Stylus brings a more accurate and precise way to take notes in meetings and classroom settings or to sketch out rough ideas while on the go.

The stylus has a focus on ergonomic comfort and balanced weighting of the pen. In addition, the fine tip gives the user more detail control.

It is ideal for handwriting notes, drawing, as well as sketching. While designed for the iPad, it should be compatible with all media tablets that use the same capacitive touch technology.

It will be available from mid-May.

<http://bamboostylus.wacom.asia>



*The stylus provides users with a more accurate and precise way to use their tablet.*

## **Android tablet**

Consumer electronics manufacturer, Kogan has developed a 7" tablet, running Android 2.2.

Powering the Kogan Agora 7" tablet is a Cortex A8 processor clocking in at 1Ghz, powerful enough to support 720p HD video playback. It has 512MB DDR2 RAM, internal storage of 4GB and a microSD slot to cater for up to 32GB external storage.

Its 7" capacitive touchscreen has a resolution of 800x480 and the device itself weighs a mere 390g, making it highly portable.

Wireless connectivity is provided in the form of 802.11b/g wireless. Other forms of connectivity include micro USB and mini HDMI ports. It also has a built-in microphone, a front-facing 1.3 megapixel camera, and headphone output.

[www.kogan.com.au](http://www.kogan.com.au)



*The Kogan Agora 7" tablet weighs just 390g.*

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**calendar**

## Engineers Australia conferences

The [Australian Control Conference \(AUCC2011\)](#) will be held on 10-11 November 2011 in Melbourne.

### Other events

The 2011 [CEDIA Expo](#) will be held on 11-13 May in Sydney. The event showcases electronics products for both the residential and commercial sector.

The annual [CeBIT Australia](#) conference is returning to Sydney on 31 May to celebrate its 10th anniversary. This year's showcase will have a strong focus on enterprise mobility and how it will be a key technology to drive productivity compliment concepts such as cloud architecture based business.

Providing business information and discussing issues driving business trends and development, the [Australian Business & IT expo](#) will be held at the on 18 Aug in Melbourne.

The conference and trade exhibition [New technologies in energy networks – topping up or tripping over?](#) will be held on 7-9 Sep in Sydney.

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