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ANALYSIS

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DIGITAL ISLANDS: HOW THE PACIFIC'S ICT REVOLUTION IS TRANSFORMING THE REGION

The Pacific Islands region is in the midst of an information and communications technology (ICT) revolution that could have major implications, particularly for democratic governance and the region's development. In urban, and increasingly in rural settings, Pacific Islanders are using new digital tools to communicate, form online networks and coordinate.

Approximately 60 per cent of Pacific Islanders now have access to a mobile phone and this figure continues to climb. Mobile Internet is leapfrogging obvious barriers to Internet access such as geographical remoteness, financial cost and availability. A boom in mobile phone use has facilitated the rise of social media in the Pacific.

This Lowy Institute paper describes some of the early impacts of the region's ICT revolution. In particular, the combination of these powerful digital tools has given Pacific Islanders greater opportunity to harness, influence and promote political and social change in the region. Led by bloggers, digital entrepreneurs and social media groups in Papua New Guinea, a Pacific 'digital generation' is emerging that is playing an increasingly influential role in society.

This ICT revolution also has great implications for the region's development, although so far these new tools have been underutilised in this sphere. Pacific Island governments, the private sector and international donors could make far better use of the region's ICT revolution, in particular, supporting more effective resource allocation and greater service delivery, by using digital tools such as mobile applications and crowdsourcing.

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DIGITAL ISLANDS**Introduction**

The Pacific Islands are experiencing a digital transformation that could have major implications, particularly for democratic governance and potentially for the region's development. Some of the fastest-growing rates of mobile phone uptake in the world are changing the way Pacific Islanders communicate, learn, engage in political debate, coordinate activities and access services.

A number of factors are driving this revolution. In particular, since 2003 the Pacific's telecommunications sectors have undergone deregulation and reform, driving down prices and fueling a boom in mobile phone use. By comparison, many developing countries undertook such reforms in the 1990s. Telecommunications reform occurred in most Asian countries in the 1980s and 1990s.

The Pacific's ICT revolution is also being sustained and accelerated by the region's youth bulge. One fifth of the region's population, approximately two million people, is aged 15 to 24, and in Melanesia the proportion of youth is even greater.¹ As in other parts of the world, the youth of the region are the fastest adopters of the new digital technologies.

This influx of mobile phones in the Pacific Islands has occurred at the same time as another global phenomenon sweeping the world, the rise of social media, and the Pacific's growing mobile phone penetration has helped fuel social media uptake. Access to social media communities is enabling Pacific Islanders to connect with one another, form online networks, share content, project opinion, promote debate and coordinate activities in

ways that were unimaginable just a few years ago. This has resulted in the emergence of a Pacific 'digital generation' of activists, thinkers, informers and influencers.

What makes the ICT revolution in the Pacific particularly transformative is its potential to address the region's demographic, geographic and economic challenges. The Pacific Islands are sparsely populated, comprising 22 culturally diverse, small developing countries and territories with a combined population of just over ten million. This population is dispersed across hundreds of small islands and atolls, spanning an area one third of the globe's surface. The region's distance from global economic centres makes for some of the most remote countries and territories in the world. Many countries within the region, particularly those in Melanesia (Papua New Guinea, Fiji, Solomon Islands, Vanuatu and New Caledonia), suffer high unemployment and a lack of basic education and health services.

For an increasing number of Pacific Islanders, mobile phones are helping to overcome these challenges. Geographic remoteness is not as profound when e-services and mobile applications can be used to connect with health services, transfer money, access learning materials and organise events, all through a basic mobile handset. As mobile-phone facilitated Internet access continues to spread outside urban hubs and smartphones become more accessible and affordable, e-services hold great promise for more inclusive economic development in the region.

The first part of this Analysis provides an overview of the changing ICT landscape in the Pacific. The paper then considers the

DIGITAL ISLANDS

implication of this transformation in two areas in particular: first, democracy and governance, and second, the still largely unfulfilled potential for its use in development in the region.

This revolution is mobile

The region's ICT revolution has largely been the result of a massive increase in mobile phone use. Officially, the Pacific Islands have some of the lowest Internet penetration rates in the world. Only two per cent of Papua New Guinea's population had access to the Internet in 2011 and in Solomon Islands, Samoa and Vanuatu, Internet penetration rates remain under ten per cent.²

As the Pacific's mobile networks continue to upgrade to 3G and 4G, the spread of mobile Internet has enabled the region to leapfrog computer-enabled Internet connections. Fixed or wireless computer broadband Internet connections are expensive, not widely accessible, require hardware (a computer, a modem etc.) and are not as convenient as mobile connections, especially for Pacific Islanders living outside of urban centres. Web-enabled mobile phones are now sold in most Pacific Island markets. These range from the more expensive Blackberry, iPhones and high-end Nokia smartphone varieties down to the more affordable handsets made by the Chinese telecommunications firm Huawei and Digicel's 'Facebook phone'.

It is estimated that 60 per cent of Pacific Islanders now have access to a mobile phone.³ This is an enormous increase from 2006 when the region's mobile phone penetration was under ten per cent.⁴ According to one report,

there are now more Pacific Islanders with mobile phones than bank accounts.⁵

This growth in mobile phone access is extraordinary given that in 2008, six countries had penetration rates of less than 16 per cent, including Papua New Guinea, Vanuatu, Solomon Islands, Kiribati, Tuvalu and the Marshall Islands.⁶ In Tonga, mobile penetration rates have risen from three per cent in 2002 to 53 per cent in 2011.⁷ Fiji, Samoa, Vanuatu and New Caledonia now enjoy mobile penetration rates of over 80 per cent.⁸ In PNG, mobile penetration has increased from two per cent in 2006 to 34 per cent in 2011.⁹

Mobile phones are being used to access the Internet, listen to radio, receive SMS text information services, take and send photos and video, access social networking sites, download music and even watch television. A June 2012 study, undertaken by ABC International and Intermedia, shows that more Papua New Guinean households now have access to a mobile phone than to a radio.¹⁰ What's more, the same study reveals that 53 per cent of Papua New Guineans who access radio do so by listening via their mobile phones.

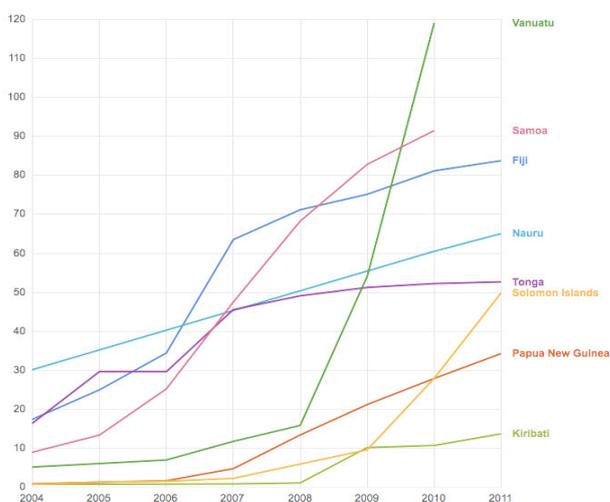
Another major use has been in so-called 'mobile money'. The mobile money market is relatively developed in the Pacific Islands and both major mobile phone providers and banking institutions offer mobile banking options. Digicel's 'Mobile Money' service offers customers a range of mobile financial services, including the ability to transfer money to friends and family nationwide and pay utility bills through mobile phones. Mobile Money, first launched in Fiji in July 2010, has now expanded to Tonga, Samoa, Papua New

DIGITAL ISLANDS

Guinea and Vanuatu. In Samoa, Fiji and Tonga, an international service has been added, which Digicel claims has slashed the cost of inter-country remittances.

In 2011, the Bank of South Pacific implemented a new rural banking initiative which aims to deliver banking services to the large number of ‘unbanked’ in PNG through a combination of wireless-enabled branches and phone banking. This new network will be extended by a range of phone banking services and is one example of how rural and remote communities can benefit from advances in ICT.

Mobile subscriptions (per 100 people) for selected Pacific Island countries¹¹



One major driver of this massive increase in mobile phone usage has been telecommunications deregulation and reform. This began in 2003 in Tonga and over subsequent years occurred across most countries in the region. Some of these reforms were supported by development partners including the International Finance

Corporation and the Australian Government (through AusAID). Despite this push to open up telecommunications markets, monopolies can still be found in Kiribati, Marshall Islands, New Caledonia, French Polynesia, the Cook Islands and the Federated States of Micronesia.

The main impact of these reforms has been to make mobile phone ownership much more affordable and accessible. Before Fiji ended its telecommunications monopoly it had some of the highest mobile phone prices in the world.¹² Within months of the onset of competition, mobile phone call rates had dropped by 44 per cent and SMS text message prices had fallen by half.¹³

Irish-owned Digicel, which launched in the Pacific Islands region in 2006, is now the leading and fastest-growing mobile operator in the Pacific Islands. It operates in Papua New Guinea, Fiji, Samoa, Vanuatu, Tonga and Nauru.

In Papua New Guinea, telecommunications competition resulted in both price falls and an accelerated growth in mobile subscriptions. In 2006, PNG had the lowest rate of mobile phone penetration in the Pacific and only 100,000 mobile phone subscribers. Digicel entered the market in 2007, and within eight months the price of a SIM card had fallen by 80 per cent and the cost of a mobile phone call had fallen by more than a third.¹⁴ In 2008, mobile phone subscriptions had risen more than eightfold to 874,000 and by 2009 this figure had increased further to 1.4 million. Since 2009 this has reached 2.4 million mobile phone subscriptions, out of PNG’s total population of seven million, an increase of 2,400 per cent over a five-year period.¹⁵

DIGITAL ISLANDS

Further improvements in access and speed can be expected as Pacific Island countries seek to improve their telecommunications infrastructure. Vanuatu is expecting Internet speeds 3,000 times faster than present levels when a fibre optic cable is completed in 2013, as a result of which the country will no longer have to rely on slow and expensive satellite communications.¹⁶ In addition, Solomon Islands is set to develop a submarine fibre optic communication cable system after securing a grant and a loan from the Asian Development Bank. This new project will enhance Internet communications and is expected to reduce the cost of telecommunication services, in turn, creating savings and enhancing opportunities for Solomon Islands consumers and businesses.¹⁷

China, one of the region's largest trade and development partners, has begun filling a gap in the market by working with Pacific Island countries to support low-cost telecommunications and digital services. It is providing the region with low-cost Internet and international calls through a new satellite deal, which will benefit Vanuatu, Solomon Islands, Fiji, Tuvalu, Tonga, Papua New Guinea and New Caledonia. It is hoped the satellite, which will be launched from Russia, will advance business and education opportunities while lowering the costs of Internet and communications in these seven Pacific Islands countries. Another example is the launch of Vanuatu's eGovernment network, funded by a Chinese loan and serviced by Chinese Government-owned Huawei.

Digital atolls: Nauru and the Cook Islands¹⁸

Nauru and the Cook Islands are two of the smallest and least populated countries in the world. Aside from size the two countries share few similarities and have faced quite different ICT challenges. A decade ago, Nauru did not have a telecommunications operator, and hence no mobile phone network, and the Cook Islands had a mobile phone penetration rate of less than 10 per cent.¹⁹

Nauru's population of 10,000 lives on one island that is approximately 21 square kilometres in size. The country has an extremely young demographic, with over 40 per cent of the population aged under 15 years.

Digicel set up operations in Nauru in September 2009. The President of Nauru, Marcus Stephens, was so thrilled he declared their first day of operation – 1st September 2009 – a national holiday.²⁰ Within two years Digicel had signed up 6,500 mobile phone subscribers. Digicel estimates that over half of these subscribers are using their mobile phones to access the Internet and social media sites.

Unlike most other Pacific Island countries, Nauru does not host a bank or a financial institution. With this in mind, Digicel is working with the Nauru Government to introduce a mobile wallet to allow people benefit from financial services. Digicel is planning to roll out this project at the end of 2012.

The Cook Islands have a population of 11,000 inhabitants that, unlike Nauru, are dispersed across 15 small islands scattered across the

DIGITAL ISLANDS

South Pacific. In less than ten years, there has been more than a fivefold increase in mobile penetration rates from 8.34 per cent in 2002 to approximately 66 per cent in 2011.

Telecom Cook Islands estimates that they sell in excess of 3,000 mobile phone handsets annually (a portion of which are purchased by tourists). They estimate that more than 30 per cent of mobile phone handsets on the islands are web/data-enabled mobile phones.

Until October 2012, mobile data was only available on postpaid plans. As a result, Telecom Cook Islands estimates the numbers of customers accessing social media on their mobiles to be relatively low. However, this number should increase significantly now that the company has introduced mobile prepaid data. SMS Banking was also recently introduced by two banks that operate in the Cook Islands but a fully-fledged mobile banking system has not yet been implemented. Cook Islanders do not yet have access to 3G but Telecom Cook Islands is investigating options for upgrading the system.

Digital democracy

The implications of the Pacific Islands' ICT revolution are diverse and far-reaching. But among the most significant is the increased access the region's once disconnected populations have to networks and conversations that enable them to demand better governance.

The largest online network in the Pacific Islands region today is Facebook. As of

November 2012, there were approximately 700,000 Pacific Island Facebook users; more than 150,000 of these joined the social networking site in 2012.²¹ This growth in membership is being driven by Papua New Guinea, where the total number of Facebook users has tripled since mid-2011, followed by high growth rates in Fiji and Samoa.

Five Pacific Island countries ranked in Facebook's top twenty growth markets, as a percentage of population, for the six-month period April to September 2012. Coming from relatively small bases, Samoa and Papua New Guinea have been Facebook's third- and fourth-largest per capita country growth markets, recording Facebook membership growth rates in excess of 50 per cent and outstripping all countries except Japan and Vietnam in this period. There have also been large increases in Facebook membership in Nauru and Kiribati, two of the smallest countries in the region, and Solomon Islands.²² Most of this growth is occurring across the age group of 16 to 34 years old.

Not all Pacific Islanders signing up to Facebook are doing so to discuss politics or social issues. Nevertheless, as it has elsewhere, Facebook has enabled the creation of new online communities where these issues are being discussed. Clay Shirky, Professor of New Media at New York University, noted in *Foreign Affairs* magazine that 'access to information is far less important, politically, than access to conversation'.²³ Social media provides the people of the Pacific Islands with an easy and low-cost way to engage in domestic, regional and international dialogues. It is also a tool that does not discriminate on the grounds of gender, religion, sexuality or income level.

DIGITAL ISLANDS

An excellent example of this is the PNG Facebook discussion group Sharp Talk. Over the past year it has tackled and debated issues including domestic violence, rape, the mining sector, paid parental leave, Chinese ownership of businesses, Australia's visa system for Papua New Guineans, the costs of transferring funds through banks, gay rights and gender inequality.²⁴

This site has been successful for two key reasons. First, growth in Facebook users in Papua New Guinea has propelled this site from a small discussion group to the centre of debate for young Papua New Guineans and emerging leaders. The second reason for Sharp Talk's success is the proactive regulation of the group by its small group of administrators. They encourage inclusiveness, assist in informing debate, discourage and punish cyber-bullying (you can be banned from the site). Despite this regulation, the site remains informal at heart and is used to brainstorm ideas and test opinion.

In Vanuatu, the largest Facebook discussion group Yumi Tok Tok Stret has close to 10,000 members – a large membership for a country of only 240,000 people.²⁵ It has a similar approach to Sharp Talk. Members are encouraged to debate political, social and economic issues of importance to Vanuatu while ensuring they adhere to ten regulations which include 'no discrimination/regionalism' and 'no gender inequality posts'. Australia-Vanuatu issues have been debated, including in May 2012 when Vanuatu's Foreign Minister asked the Australian Federal Police to leave the country.²⁶

It is not only activists who are embracing Facebook and social media, however. Across the region, Pacific governments and multilateral institutions are also using these tools, with varying degrees of success. The Government of Tonga has set up Facebook and Twitter accounts.²⁷ The Kiribati Government has set up social media networks in order to connect with and engage journalists on environmental issues.²⁸ The Pacific Islands Forum Secretariat, the Pacific's key regional organisation, joined Facebook in late 2010 and uses the social media site to promote press releases, job advertisements and new research.²⁹

In Fiji, where restrictions on freedom of speech and assembly were imposed in 2009, the military-led government has engaged a US public relations firm to help it communicate a more positive image, and this includes a push into social media and blogging. The Fiji Government pays Qorvis Communications US\$40,000 a month to provide 'public relations services'³⁰ which includes the management of six blog accounts and social media accounts, including the Fiji Government's key twitter accounts – @FijiPM, @FijiAG and @FijiRepublic.³¹ The Facebook page for the Fiji Ministry of Information has harnessed more than 4,500 'likes' and does multiple daily updates on everything from the weather to posting family-friendly photos of Prime Minister Bainimarama.³²

By and large, however, the government's social media efforts have not paid off. The three twitter accounts managed by Qorvis Communications have failed to attract much attention. Prime Minister's Bainimarama's account currently has only attracted 600 followers from 550 tweets.³³ (By comparison,

DIGITAL ISLANDS

the President of the Maldives has amassed more than 15,000 followers through only 200 tweets.) The Fiji Government's blogs, despite publishing regular content, have struggled to draw Fijians into discussion and debate, and the comments facilities remain largely unused.³⁴ Fiji has the largest Facebook population in the Pacific Islands region, with almost 200,000 Fijians (approximately 20 per cent of the population) on Facebook. Yet the Fijian Government's PR and social media campaign has not been successful in enticing Fijians to follow, 'friend' and engage with the government through these online channels. What this shows is that despite considerable effort and resources being channelled into social media, what is really required is a genuinely free and open environment to promote discussion and engagement.

Papua New Guinea: a mobile tribe

Until 17 October 2007, PNG Telikom had a monopoly over fixed-line and mobile services. Prior to competition, Telikom's subsidiary Bemobile had only 160,000 mobile phone subscribers, mostly based in the capital, Port Moresby.³⁵ Five years ago, mobile phones were luxury goods for PNG's well-off urban inhabitants.

Fast-forward five years and PNG's mobile penetration rate is approaching 40 per cent of the population and the country now hosts three mobile phone carriers (Bemobile, Digicel and Citiphone). The price of calls has dropped by 60 per cent.³⁶ Mobile phone operators now cover more than 75 per cent of the population.³⁷

Cheap 'smartphones' are now flooding the market, allowing customers to access email and social media. In 2011, 3G broadband was introduced into the market and is now available through a range of mobile phone handsets. There are over 136,000 Facebook users in PNG, a figure which has tripled since mid-2011.³⁸ Today, few young Papua New Guineans would purchase a mobile handset that did not include, at the very minimum, access to Facebook.³⁹

There have been downsides to the growth in mobile phone usage. Police officers have complained that mobile phones have helped criminals become better organised.⁴⁰ Complaints are surfacing on Facebook page Sharp Talk that young men and boys have been sharing and promoting pornography through their mobile phones (known as 'mo-po'), with negative social consequences.⁴¹ According to researcher Amanda Watson, many Papua New Guineans she interviewed in the course of field research for her PhD on mobile phone use were concerned about the use of mobile phones to arrange extra-marital affairs.⁴² More recently, cyber-bullying has become an issue.

In early 2012, a private research consultancy forecasted that by 2015 Papua New Guinea would have 2.9 million mobile subscribers.⁴³ Given that mobile phone subscriptions have already reached 2.4 million and have grown by approximately half a million subscriptions a year between 2008 and 2011, this may well prove to be an underestimation.

This growth in mobile telecommunications stands in stark contrast to PNG's Internet penetration rate, which has hovered at a tiny two per cent since 2008. A new 750km fibre

DIGITAL ISLANDS

optic cable was launched in July 2012, however, and this is expected to drastically reduce prices and improve Internet penetration.⁴⁴

Accountability and transparency

One of the most striking effects of the Pacific's ICT revolution has been the impact of these digital tools on accountability and transparency. There are a number of prominent examples of the way in which social media has been used to shed light on negligence, poor service delivery and corruption.

In 2011, Facebook groups were set up by social media users in PNG to protest police inaction in the case of a former policeman, Simon Bernard, who had been beating his wife regularly over a six-year period.⁴⁵ A Facebook group, 'Papua New Guineans against domestic violence', was created in response to the media reports and used by Facebook members to express their anger and frustration, engage in debate on the issue, as well as share domestic violence stories.⁴⁶ This Facebook group, which attracted 5,000 members in its first 48 hours, also received coverage across blogs in PNG and in international media including the Huffington Post.⁴⁷

This domestic assault case prompted civil society groups to use online and social media tools to encourage Papua New Guineans to sign a petition and to demand action from the local police.⁴⁸ After receiving over 500 emails, the PNG superintendent in charge of the case appealed for public help in the case and was forced to launch an investigation into allegations that police had been harbouring Simon Bernard.⁴⁹ Today this Facebook group

remains a site to discuss domestic violence issues in PNG. It contains emergency contact information so that victims of domestic violence in PNG have access to immediate support as well as to health and sexual violence centres.⁵⁰

Early in 2012, the Pacific International Hospital in PNG found itself at the centre of attention when PNG blogs and social media sites drove a campaign to hold health authorities to account after they discovered an email that alleged a ten-year child had died because the child's family did not have enough money to pay for medical services up front.⁵¹ A Facebook group was set up calling for the closure of the hospital after similar stories emerged and were discussed on social media, radio and in newspapers.⁵² In response and under pressure from this public campaign, PNG's Health Minister at the time Jamie Maxtone-Graham, who was in the UK at the time attending a health workshop, launched an investigation into the incident.⁵³

The imposition of media censorship and restrictions on freedom of speech and assembly in Fiji in April 2009 gave blogs on Fiji an unexpected prominence. Most Fiji-focused blogs are hosted outside the country – in Australia and New Zealand – which gave them greater freedom from government scrutiny. In the absence of reliable sources of information from the traditional media in Fiji, these blogs, including Coupfourpointfive, Croz Walsh's Blog, Raw Fiji News and Intelligentsiya, became an influential source of news about Fiji for interested Fijians, media and foreign governments. The blogs served as an accountability tool in the absence of other

DIGITAL ISLANDS

traditional democratic accountability mechanisms.

The Fiji government lifted official censorship of the media in January 2012 but left in place penalties for breaches of new tighter media regulations. These regulations continued to restrict the freedoms of traditional journalists to criticise the government and served to encourage 'self-censorship'.⁵⁴ There is still an important role for bloggers or other social media users in promoting transparency around events in Fiji, particularly in the period leading up to elections in 2014. But some of the Fiji-focused blogs have lacked the editorial or administrative disciplines that other prominent Pacific blogs and Facebook groups have used to good effect, which has the potential to diminish their usefulness as accountability tools.

West Papua, a disputed Indonesian province, has seen the emergence of tech-savvy civil society organisations, bloggers, ICT groups and social media enthusiasts. Severe restrictions on press freedom have encouraged digital campaigns that advocate for greater transparency from the Indonesian government and promote the need for more accountability. Photos and videos, shared and discussed online (often on Twitter via #Papua), have focused attention on West Papua, particularly amongst international media organisations such as Al Jazeera and *The Economist*. Videos of West Papuans discussing torture and displaying wounds from alleged torture have been posted on video-hosting sites including YouTube and often record in excess of 100,000 views.⁵⁵

Unsurprisingly, this use of social media and the Internet to promote accountability and transparency is drawing a response from some

governments in the region. In 2010, the PNG government issued a writ to the country's major Internet service provider ordering it to block blogs hosting a leaked report of a major corruption inquiry into the PNG finance department that directly implicated senior PNG politicians.⁵⁶ In early 2012, the PNG Government announced a 'monitoring committee' tasked with identifying citizens who express views the government considered 'subversive'.⁵⁷ This announcement calls into question the government's commitment to freedom of speech.⁵⁸ Rather than intimidating PNG's online community, the announcement served to fuel and energise online debate.

There is no evidence to suggest that the PNG Government's attempts to place controls on 'any person found using their mobile phone, email or Facebook to spread information considered malicious and misleading' have been effective in censoring online discussions. These developments do demonstrate, however, the growing prominence of social media networks and blogs as tools of accountability for governance in PNG.

In fact, some outside governments are playing a role in promoting Internet freedom in the region. The US State Department is set to sponsor the first Pacific Islands Youth Tech Camp. It is intended that these multi-day camps will give young Pacific Islanders a greater understanding of ICT and Internet governance issues, including sessions on the Arab Spring, freedom of expression, and the role of women in ICT.⁵⁹ Somewhat surprisingly, the first meeting will take place in Fiji in November 2012. The camp will also teach attendees how to develop mobile phone applications, and the coordinators believe that this will be the first

DIGITAL ISLANDS

example of localised mobile application development.

Activist bloggers

The blogosphere has been a key sphere for exposing corruption and unlike traditional media, most of these online media provide forums to discuss and debate these reports. In PNG, there are increasing examples of bloggers posting leaked reports. For example, in August 2012 the Masalai blog obtained and published a private draft copy of the 2012 Review of the Pacific Islands Forum Secretariat. This report criticised both the effectiveness and management of the Pacific Islands Forum; it also argued that Australia, New Zealand and the European Union had too much influence on the Forum's operations. This blog post was reported on by Australian media and republished on other blogs and by non-government organisations in the region, including an AusAID-funded think tank in Vanuatu, the Pacific Institute of Public Policy.⁶⁰

China's role in the region is a topic attracting more attention among Pacific's bloggers. In Fiji, for example, a 'first of its kind' data centre based in Suva has been built with a \$US20 million concessional soft loan from China. It is intended that the facility will serve as the Fiji Government's information technology backbone and include the secure storage of data. The fact that there is so little independent information publicly available about this unique venture, coupled with Fiji's tight media restrictions, has got some of Fiji's bloggers speculating on the details of this project. They have even located the centre using Google Earth.⁶¹

A newly announced A\$3 billion Chinese loan to rebuild the Highlands Highway, the major road in PNG, continues to be critically examined and debated by PNG bloggers.⁶² This large loan has also been widely discussed on Facebook sites including on Sharp Talk, where members have shared and discussed their concerns. These include how the PNG Government will repay the loan, the lack of transparency concerning the details of the loan itself, and whether Chinese nationals will be brought in to work on the roads projects.⁶³

Some of the region's bloggers are gaining domestic and international prominence. In Papua New Guinea, well-known blogger Tavurvur, who has been blogging since 2008, has had his blog posts and tweets quoted in *The Economist* and *The New York Times* as well as extensively across Australia and Pacific media. In October 2012, he was approached for a fortnightly 15-minute segment on a primetime talkback show for PNG's national radio broadcaster, the National Broadcasting Corporation. Following the success of his first show, where he discussed PNG's new A\$3bn Chinese loan, NBC asked him to appear on the program weekly to discuss politics, trade and development issues.

Social media, mobile phones and public protest

As they have elsewhere in the world, digital tools are being used in the Pacific to plan and coordinate public protest. On 10 April 2012, some ten thousand Papua New Guineans gathered at the Sir John Guise Stadium in Waigani, Port Moresby to protest a pending decision by Parliament to defer the national

DIGITAL ISLANDS

elections by six months, as well as the controversial Judicial Conduct Act.

Mobile text messages, Facebook posts, tweets (using the hashtags #PNG and #OccupyWaigani) and photos and videos posted in real time were used to spread details of the proposed protest in a carefully coordinated online effort. At 10am on the morning of the planned protest, university students gathered and then marched from the University of PNG to the stadium to meet with the individuals, civil society groups and trade union groups who were already waiting at the stadium. According to one popular PNG blogger, these students were encouraged to march (as opposed to taking public transport to the stadium) because, as one PNG blogger put it;

*'...in a lesson learnt from Tahrir Square...
...once a small group with great legitimacy takes [to] the streets, the sympathetic public joins the queue. And it worked as the students marched to Waigani with a 5000 strong crowd.'*⁶⁴

This was not the first protest in the Pacific Islands arranged using mobile phones and social media, but it was certainly the largest. On the day of the march, Prime Minister Peter O'Neill made a late decision to attend and speak to the large crowd of protesters. In his address he agreed to repeal the controversial Judicial Conduct Act (on the condition the Chief Justice stepped down) and agreed to stick to the general election timetable (although a short delay was flagged). The event was seen as a huge success by those who organised it.⁶⁵ The Prime Minister's response, coupled with widespread domestic and international media

attention, seemed to underline the political power of social media.

Much less positively, in December 2011 mobile phones were used to spread anti-Chinese sentiment and calls for Papua New Guineans to 'forcefully evict' Chinese from the country.⁶⁶ The circulation of these text messages resulted in an immediate response from police, who brought in additional resources from across the country and set up roadblocks near government buildings.

In Solomon Islands, the Facebook group, Forum Solomon Islands International, has focused media attention on the poor health services at a Honiara hospital. It has used Facebook to encourage locals to meet up and volunteer two days of their time to renovate the children's ward, in addition to raising and collecting funds for the hospital.⁶⁷

Digital development

As significant as the Pacific region's ICT revolution has already been for governance and transparency, its impact on the region's development might prove to be even more transformational. The benefits of ICT for development are well documented. Greater connectivity, lower communications costs and access to ICT tools help to decrease business costs, increase productivity, connect services to those who need them, promote entrepreneurship and give organisations, including governments and donors, an automatic feedback loop on their activities and programs. Studies have shown that a ten per cent increase in broadband penetration can help to raise annual per capita GDP growth by

DIGITAL ISLANDS

0.9 to 1.5 per cent.⁶⁸ A 2009 World Bank report found that a ten per cent increase in mobile penetration can translate into a 0.81% increase in GDP for low and middle-income economies.⁶⁹

In the Pacific a high proportion of children are unable to read or write upon completion of the primary school cycle.⁷⁰ The quality and availability of health services varies wildly across countries. Progress towards gender equality has been incredibly slow. For all of these reasons there is great potential to use ICT tools to enhance the quality of services, more effectively allocate limited resources, and promote greater gender equality.

Social media is, for example, being used by healthcare providers to record and communicate data and information on diseases, disasters and resource needs in real time, and therefore better coordinate healthcare and humanitarian responses. In Fiji, for example, the Fiji Medic Home Run page shares and discusses medical information, and answers questions on medical and health issues from Facebook members.⁷¹

Indeed, for the Pacific Islands region, some of the greatest opportunities are in mobile health applications, or 'mHealth' as it is called. In Fiji, 13,000 subscribers are now using a new mobile health service developed by the Vodafone Foundation.⁷² The service, called Dr SMS, allows subscribers to communicate with doctors directly and issues alerts about emerging diseases, and provides a means to respond to natural disasters. A team of 20 medical doctors from the Fiji Medical Council and Fiji College of General Practitioners reply to medical cases within 24 hours via SMS, and

when required provide referrals to the nearest medical facility. Dr SMS expects to undertake up to 5 million text consultations per year.⁷³

In July 2012 Papua New Guinea's first free, national mobile health (mHealth) program was launched by Population Services International (PSI), a global health NGO that operates in more than 60 countries. The mHealth application, called Haus Lain ('house line' in Tok Pisin) sends weekly SMS messages, in English and Tok Pisin, on issues such as malaria, the prevention of child and infant deaths, gender-based violence, and HIV. The mobile program, which is supported by AusAID, allows users to sign up easily by texting 'JOIN OK' and has attracted almost 30,000 subscribers since its launch. In October 2012, the mobile service was promoted through radio stations and resulted in a sharp increase in subscription numbers. PSI plans to expand the service in 2013 to incorporate more interactive mobile application features.

An education-focused mobile phone service is currently being planned for two provinces in Papua New Guinea. Designed by Voluntary Service Overseas and supported by AusAID, it is intended that free SMS software will be used to disseminate daily text messages to teachers in rural schools.⁷⁴ The project is called SMS Story and will involve sending text messages that will contain lesson plans and short stories that teachers can write on the blackboard. The University of the South Pacific is moving into m-learning, which involves teaching and learning through the use of mobile technologies. It has also established a gateway for mobile learning and students will soon be able to enrol in courses and access books through mobile Internet.⁷⁵

DIGITAL ISLANDS

Unrealised development potential

So far, however, the use of ICT tools for development in the Pacific has been tentative and ad hoc. With the exception of mobile banking, mobile application options are very limited, both in terms of the quantity of applications available to Pacific populations and also in the scope of services offered. Pacific Island leaders have recognised and committed to ‘using ICT as a key tool for the development, governance and sustainable livelihood of the people of the Pacific’.⁷⁶ However, the region and its stakeholders, including business, civil society and donors, lack a well thought out and coordinated ‘ICT for development’ strategy.

There clearly remains significant potential to do more to utilise the Pacific’s growing ICT infrastructure for development and social outcomes. Two particular areas where more could be done in the Pacific Islands are in the use of mobile applications and crowdsourcing.

The boom in mobile phones and continuous advances in mobile phone technology could be exploited far more by greater use of mobile phone applications and mobile-based projects for development. In other parts of the developing world, mobile-based applications are being used, for example, to test the quality of water in communities, to exchange and assess ultrasound images so that mothers in remote locations can connect with medical practitioners, and to provide farmers with tailored fertiliser advice via text message.

In Uganda, Kenya and Tanzania, communities living around Lake Victoria have had access to an SMS service which alerts users to dangerous weather patterns.⁷⁷ Weather warnings are sent

via mobile phone to fishermen, giving them the opportunity to avoid the lake if a storm is approaching. Importantly, the system is accessible to those who are illiterate via a colour-coded system of alerts. Green means winds of less than five knots and no significant weather conditions predicted, whereas red means a high likelihood of winds over 20 knots, or severe thunderstorms, a high hazard threshold, and advice to ‘take action’.

This text-based service operates under a form of public-private partnership and was developed by the World Meteorological Organization, Uganda Department of Meteorology and telecommunications company Ericsson. The applicability of such a service to the Pacific, given the remoteness of many communities, the high rates of illiteracy in some countries, and the enormous impact that weather patterns have on ordinary lives, is obvious.

The second area where more could be done to exploit the Pacific’s ICT revolution for development is crowdsourcing, which is a process by which an organisation or individual harnesses information or solutions from a distributed group of people. Essentially, it can be described as an open call for proposals from the public. Crowdsourcing can be as simple as organisations asking for feedback and ideas from customers via social media sites; or it can be as complex as crowdsourcing a range of different online and mobile media sources to group together real-time data on a conflict or disaster situation.

There have been some steps in the Pacific to make use of ‘crowdsourcing’. For example, Ushahidi, a website which crowdsources

DIGITAL ISLANDS

information and visualises this information interactively through on-line mapping, is beginning to be utilised to expose basic infrastructure problems in PNG. Fix My Road, a simple mapping tool powered by Ushahidi in PNG, has been created, and displays simple data sourced from mainstream media, blog posts, SMS text messages, tweets, photos, video and emails on the conditions of roads in the country.⁷⁸ Developed by academic Matt Morris, the map is a practical example of how crowdsourcing can be used to provide real-time feedback on the state of roads, and by implication, the quality of government roads maintenance and basic service delivery.

One of the largest crowdsourcing projects currently being undertaken is a Ushahidi project, launched in 2011, that aims to monitor the effectiveness of services in Kenya including health, education, governance, infrastructure, water and justice. Titled Huduma (the Swahili word for service), the project enables people to send – by text, email or Twitter – reports on the performance of services in their district.⁷⁹ Information from users is mapped on the Huduma site and the responsible authority will be identified.⁸⁰ Such a tool would be valuable in Pacific Island countries and would give communities, both urban and rural-based, the opportunity to demand better-quality services from their governments, donors, civil society and the private sector. Public access to such valuable data would also enhance institutional accountability and transparency.

Crowdsourcing has also been shown to be a particularly effective tool in responding to natural disasters – another very relevant application in the Pacific. In the devastating 2010 Haiti earthquake, data mining efforts by

employees at Ushahidi led to the release of an SMS shortcode (4636) that the public could text with information and requests for help. The shortcode was advertised on the radio, and people provided their location and needs in text. Ushahidi coordinated and crowdsourced volunteers to both translate the information from Haitian Creole into English (the dominant language used by those coordinating relief efforts) and georeference SMS texts so they could be mapped in near real time.⁸¹ This constantly updated map was used by the United Nations, FEMA and the US Marines.

Mobile data collection is another ICT tool available to the region that enables users to gather real-time information from mobile phone users. International mobile data organisations, including EpiSurveyor and GeoPoll, offer fast, easy and cheap options for crowdsourcing mobile data collection that could be used to inform policy in the Pacific Islands as well as development programming. Around the world, governments, donors, civil society and the private sector have used this service to monitor medical supplies, evaluate the coverage of vaccination campaigns and to interview refugees living in border refugee camps.⁸²

The Australian Government, as the Pacific Islands' largest trading partner and aid donor, is well placed to make better use of such tools to help the region achieve its development goals. More could be done to exploit the boom in mobile phones by funding the development and spread of mobile-based applications, like those noted above, to facilitate health and education service delivery, provide market and weather information to farmers and the

DIGITAL ISLANDS

fisheries sector, and to assist disaster response teams with real-time information.

Crowdsourcing offers Pacific Island governments and donors an extremely useful tool to better target development resources by exposing gaps in service delivery and in infrastructure. As noted in the Australian Government's 2011 Independent Review of Aid Effectiveness, crowdsourcing can be used to improve feedback from aid recipients.⁸³

The Australian Government should work with partners who have extensive experience in ICT for development projects in the Pacific or in other parts of the world. There is scope for the Australian aid program to develop a dedicated forward-looking Pacific Islands ICT for development strategy that takes advantage of the benefits of crowdsourcing, using mobile data collection and that promotes the use of mobile phone applications.

Conclusion

The purpose of this paper has been to describe some of the early implications of the Pacific's ICT revolution, particularly for democracy and development. It is still too early to judge what the full consequences of the region's rapid uptake of mobile phones and use of social media will be. Nevertheless, it does appear that the Pacific Islands' digital evolution could have a transformative impact in a number of ways. As the examples above underline, digital technologies are increasingly being used in the Pacific Islands to harness, influence and project political and social change. Already they are providing Pacific Islanders with a means to challenge some of the ways in which they are

governed, improving transparency and accountability. Even greater potential lies in the use of ICT technologies for development. But this will require a more focused effort and greater resources from governments, donors and the private sector to ensure that this potential is realised.

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