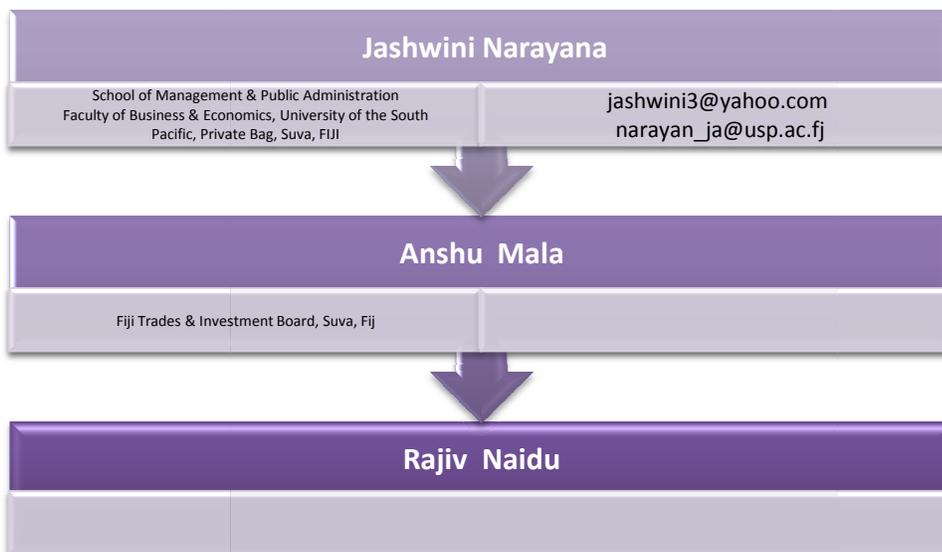




Clicking Away: Fiji's ICT Industry



Phase-II: Empirical Article

ABSTRACT

•ICT and the Internet are correctly said to significantly contribute towards an increasingly globalised world. In Fiji, quite a number of researchers have investigated into/around this ICT industry but predominantly focused either on education or tourism needs. The objectives and strategies for the ICT industry has been formulated at a national and policy level, but what is being done in implementing these policies by the relevant agencies, is an aspect to further delve into. Since the ICT industry is at its infancy, the overall progress of this industry until now will be noteworthy for further policy implications. This country and industry specific research findings suggest that Fiji has just but passed the infancy stage thus, remains very young in terms of ICT development.

KEYWORDS

- Fiji
- ICT Industry
- Pacific Island nation
- ICT
- E-commerce

The fast-paced evolution of computing technologies such as the world wide web and internet based interfaces have brought businesses and countries together like never before. Quintessentially, we are living in an era of technology where mobile phones,

computers, the internet and so forth mark our success or failure. The ability to communicate has not only been revamped, it has been revolutionised. The ADB report regards Information Communication Technology (ICT) as a powerful integrative tool for the widely dispersed, thus this sector is considerably, an important market for almost all countries but what works for the developed countries may not be workable for developing nations³. Effectively then, in any national ICT strategy, such policies must be closely linked to domestic policies in order to create a favourable environment for the development and the deployment of ICT. ICT does hold great promises for the developing economies in Asia and the Pacific - promises of: better educated workforce, empowerment of citizens, decentralisation of information, greater accessibility and communication, increased potential for research and development, and stronger integration with the global economy. However, government's need to recognise the potential of ICT and subsequently enact appropriate policies and regulations to encourage its widespread adoption in order to exploit the maximum benefit of these different and diverse technologies. In the contemporary geopolitical map, there remains significant disparity in terms of technology distribution. While some countries are world leaders, others lag far behind.

Nonetheless, the good news is that ICT has penetrated the Asia Pacific region and is growing rapidly. So much so that by the end of 2001, the region had the highest growth than any region in the world, a fifty-fold increase over 1995. Whilst small island states such as those in the Pacific region seek to increase their development and their standing in the global community, they are increasing plagued with a myriad of other problems when attempting to harness ICT progression such as the general lack of enforcement of intellectual property rights, the lack of infrastructure for e-commerce, insufficient communications infrastructure to connect rural areas and to connect to international gateways and so forth.

Literature review

A number of authors have directed their attention to ICT related activities in the Pacific. In our perusal of current local literature, we noted that current work particularly dealt with education or tourism related matters. For instance, McMaster et al. and Doorne have talked around tourism opportunities^{21, 7}. Robbins and Williams et al. have

looked into educational opportunities^{37, 47}. Chand et al. examined the impact of ICT on rural development in the Solomons⁵. We next, give brief outlines of the work of writers who have researched around the ICT industry in Fiji and/or South Pacific.

Williams' research showed that the state of libraries, archives and museums has not improved in the past five years⁴⁶. Libraries and archives do have a role in education. She furthered that on the contrary, the library situation in Fiji, Papua New Guinea (PNG) and Solomons have worsened due to poor government financial support which makes purchase of ICT equipment unattainable.

In their research on the economic impact of internet usage in promoting small-scale budget tourist accommodation businesses in Fiji, Samoa and Tonga, McMaster et al. reported that most locals have limited knowledge/exposure to ICT compared to expatriate owners who have higher skill and experience levels²¹. They concluded that if given proper design and promotion, internet can be an effective marketing tool for tourism for Small to Medium Enterprises (SMEs) in the South Pacific.

Doorne, from his research on community integrated tourism development in the South Pacific stated that communities should be actively involved in the management and control of their resources and to facilitate community integration, basic computer training and resource management practices are required⁷.

Another evaluative research on computer science curriculum in secondary schools in Fiji by William et al. highlighted that IT education needs improvement hence the need for a curriculum update, review and change. They believe that this is imperative now and even more so in the future given the rapid development in technology⁴⁷.

Minges and Gray concluded that a more liberalised telecom environment with lower prices for ICT services will provide better quality and more innovation²⁴. They stressed that Fiji compares well in terms of knowledge and affordability given the relatively high literacy and school enrolment and flat rate local call pricing for dial-up Internet access. However, they argued that Fiji does less well in infrastructure, usage and quality.

Rahiman and Naz argued that public awareness of e-governance is critical - there is a need to gauge public perception and to increase awareness³⁵. They also raised the issue of community involvement in dialogue and decision making.

Mistry and Rodrigues contended that ICTs and the right to information strategies should be developed in a coordinated fashion to open up channels of communication between Pacific Island governments and their disparate populations²⁵. They furthered that the more recent ICTs such as computers are not yet widely entrenched throughout the Pacific, hence could be effectively coupled with older ICTs, such as radios.

Thus far, very few studies have been carried out on a wider industry level for ICT development in Fiji, since it is still at developmental and/or experimental stages. Fiji has also realised, albeit late, the importance of this sector. To this end, the respective ICT stakeholders are putting in their best efforts to further develop this sector. Their efforts seek to give the sector a much more national role rather than the niche role it currently has. The objectives and strategies for the ICT industry have been formulated at a national and policy level in Fiji's Strategic Development Plan (SDP) 2007-2011, but what is being done in implementing these policies by the relevant agencies, is an aspect to further delve into. The overall progress of this industry until now will be noteworthy for further policy implications. As it is, the current regime in Fiji is tapping into the potential niche industries like ICT industry in addition to the 'cash cow' industries of Fiji. It is of no surprise that the ICT industry in Fiji is 'green' in a sense that it has just but passed the infancy stage. This research will help to advance understanding into the current status of ICT developments in Fiji. It is our hope that, our study will open up some directions for future research – to factor a holistic and intrinsic discourse into the said topic. Secondly, it is in our premise that this area remains largely 'under-researched' locally, hence one of the aims of this paper is to contribute to the current body of limited literature. Further usefulness of the study lies in its timeliness, given that Fiji has started working towards ICT development (though in a sluggish fashion), and the process is still very much in the making.

2007. There may have been further developments or up-dates after this date.

Research methods

The study used multiple qualitative research methods to collect data. Inductive strategy was followed which commenced with data collection, went onto data analysis and finally helped in the formation of generalisations. In doing so, reliance was placed on both the primary and secondary sources, which were interviews with primary document survey and secondary document survey, respectively.

Research was mainly conducted by semi-structured interviews. Questions asked were in an open-ended manner. We acknowledge that certain information might have been withheld during the interviews due to security and confidentiality matters. The topics selected for interviews evolved around: how Fiji commenced with ICT projects; what we are doing now; what Fiji plans to do in the immediate future and much later; what are the approved structure/agency fully involved in the project and what are the possible hindrance, solutions and opportunities in this sector. The aim of the interviews was to extract information from interviewees about the process, their experiences, opinions and commitments towards the practicality of the process.

These topics allowed for the fulfilment of the reason for this study. The institutional reports, departmental documents, reports and submission targets, institution/ministerial correspondences, those that were made available wherever possible were examined on the ICT sector development in Fiji for actual intentions and effectiveness of ICT programs. Additionally, cabinet decisions, ministerial speeches and other related meaningful reports were sought to view the direction and commitment of the government towards the emerging sector. The secondary sources included journal articles, conference proceedings, newspapers and the internet. Both the published as well as the unpublished sources were referred to. Newspapers were merely used to track down more reliable information.

Data gathering from all relevant sources mentioned in references ceased at the end of June

The making of the ICT sector

Fiji has slowly begun to realise that an increased use of ICT is vital for socio-economic development. Appendix 1 gives details on Fiji – country report. Stakeholders in Fiji clearly understand that ICT can contribute towards productivity improvements, especially in the public sector. The state has ensured that specific strategies and actions are contained in the National Strategic Development Plan to address this. Statistically, the communication sector reported an increase in its contribution to Fiji's GDP from 2.7 per cent of GDP in 1989 to 3.6 per cent by 2005; expectation remains around 3.5 per cent until 2008⁴³. Overall, while access to traditional ICT like radio and television is all time high, there is a rise in Internet usage.

The need for ICT development in Fiji is apparent. From a country perspective, it is important for Fiji to be at par with other nations. In so doing, it must engage in such developments. "ICT development could be thought of as a measure of the development of a culture in the scope of Globalisation"¹⁴. Fiji is a developing country and over the last 30 years or so, many businesses and academic institutions have been established. Furthermore, a greater portion of the populace is now focused on education. The combination of these factors has been the driving force behind ICT developments in Fiji. Fundamentally, with globalisation came improvement in ICT and its subsequent benefits.

An example of such a benefit is Quest, a regional call centre of the ANZ Banking Group based in Fiji. It provides state of art facilities and customer services to users of specific banking products and has become one of the premier employers of the country. In turn, it has attracted investment and recognition to the country as a whole. Fiji holds optimistic views on the development of the ICT industry, as a development tool for its economic growth. Government showed the earliest initiative towards ICT by establishing an ITC (Information Technology and Computing Services) department. Progress on further development has been slow and even stagnant at times but the year 1995 witnessed the introduction of Internet in Fiji

which brought about many developments later. Major developments started with the connection to the Southern Cross Fiber Optic undersea cable. The Southern Cross Cable - a link to the world was somewhat a milestone in the history of Fiji's ICT⁶.

In February 2002, the Cabinet Sub-Committee on Investment (CSI) decided on the compilation of the ICT policy statement of specific strategies and actions to ensure the development of the sector. In June 2002, a two-day national ICT strategy workshop was held. Later in January 2003, new members were appointed to the Information Technology Advisory Council (ITAC), after which the Ministry organised a workshop on the theme "Creating Information Economy for Fiji" with the objective of an early draft on the ICT Development Policy. Then in July 2003 an assessment of the Telecommunications, Post and Information Technology Sector was carried out by the World Bank Group. Issues raised in this assessment report are similar to those raised in the Strategic Development Plan (SDP) 2003-2005.

How did ICT development in Fiji take-off? There are many ways to answer this question. For starters, Fiji has a good strategic location, that is, it is the hub of the South Pacific. Fiji is somewhat the center of all trade in the Pacific. We also house the regional university in the Pacific (one of only two in the world). And many in Fiji are literate. Furthermore, there has been a marked increase in computer competency amongst the populace since the last decade. Unfortunately, while taking into account the fact that Fiji is a developing nation, there really has not been leaps and bounds progress in ICT sector in the past decade. A factor could be the sheer costs involved in exploiting such technology. For instance, "Fiji's mobile phone charges are among the highest in the world with the industry being monopolised"²⁷. Given this, for a country like Fiji which has a low wage rate and struggling labour market, this cost structure can be described as non-conducive for ICT development in general.

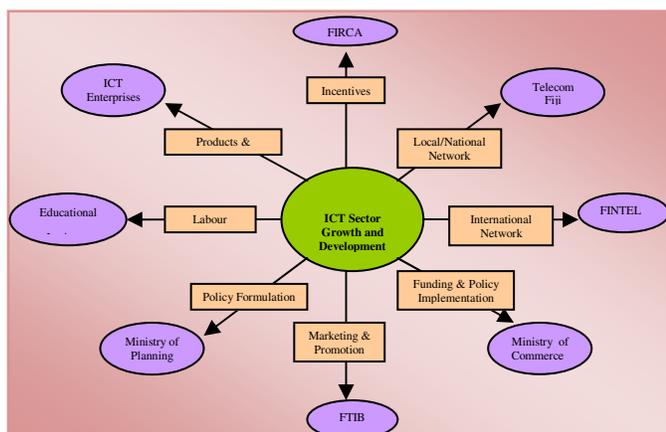
ICT development commenced with the automation of manual tasks - tasks which were time consuming and prone to errors. The actual process started with the advent of Analogue Voice Technologies with manual switch (board) operators. These electronic processes later became digitised, thus developing the local ITC even further. Specifically, the National ICT Development Policy identified the following applications as priorities:

- a. e-Filing of income tax
- b. Company office search/registration
- c. Drivers license
- d. Births, death & marriage registrations
- e. Immigration

These were particularly record keeping systems - systems which keep track of birth/death/marriage details and the immigration system which records flight details and passenger information and so forth. Keeping records in physical files is not practical any longer considering the volume of data that is involved with such applications, in view of the fact that data storage is just but one aspect. For efficient work practices, the stored data must allow easy retrieval and that too, with minimum delays. Also, the data needs to be updated with back-up for future use. Such factors gave rise to ITC development. Moreso, there is a move from the government to be citizen centric, that is, the plan is to take service to the citizens instead of asking citizens to make an effort to come to the service providers hence making things easier, convenient as well as cheaper for the public. There is, however, a process to all this. The process of ICT development commences with the identification of a need and the cost savings associated with ICT projects. Following the determination of the scope of the project, a blueprint is formulated. A team is then created to conduct a business analysis of the projects before the commencement of any development or design. At the macro level, though, there are many operational models suggested by various organisations, many of which involve a "lifecycle" approach. ICT development as a whole is a continuous process with new technologies and processes being developed. The trend remains the same with most technologies that are implemented.

The current Fiji Government is tapping into the potential niche industries like ICT industry in addition to the 'cash cow' industries of Fiji. To this end, much is owed to Fiji's connectivity to the Southern Cross Cable securing its chances to be promoted and marketed as an ICT destination abroad. Fiji boasts of a strong national ICT plan that is to unfold over the next 10 years. But, the liberalisation of the telecommunications sector must come sooner to allow for continuous development if such a plan is to materialise in the desired fashion. Further, government (in collaboration with other providers) needs to establish new units or restructure other services to monitor and support the non-formal sector.

Figure 1: The stakeholders and their roles in ICT sector development in Fiji



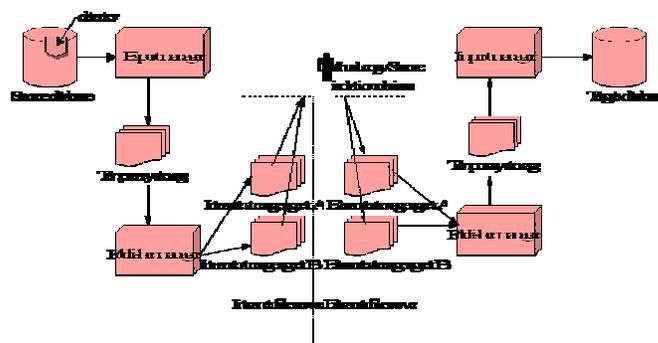
Source: Narayan, Mala, & Naidu developed for this paper

The relevant ICT industry stakeholders as illustrated in Figure 1 have a crucial role to play. The arrows in the diagram represent the role of major stakeholders to the development of the ICT sector in Fiji. There are many factors that determine ICT development. The controlling agency in Fiji is the government. The Ministry of Information gives specific licenses for ICT related technologies. The Ministry of Commerce, Business Development & Investment (MCBDI) is responsible for the e-commerce program to inform, provide advice and to assist Fiji's Private Sector businesses to adopt e-commerce and increase competitiveness. ICT funding comes from the Ministry of Finance. This Ministry is responsible for setting developmental standards. ICT in turn looks after the IT infrastructure across government departments and ministries, and is responsible for local IT capacity building.

There are universal standards and bodies that govern aspects of ICT. Fiji (and the Pacific) has been adopting standards and technologies of the more developed countries, gaining from their

successful experiences and knowledgebase. Normally, the Head Units/Offices based overseas implement new technology first, upon success, same is then transferred to their other branches in smaller countries. The model does become country specific to some extent as it depends on internal as well as factors outside our state. ICT processes are ongoing and evolving. In particular, Fiji is trying to follow the e-citizen paradigm set by Singapore. It is engaging experts from China and Singapore to aid with the e-government plan - putting our services online. There is in place a National ICT Development Policy with the theme "e-Fiji, empowering our people". The document's policy aims to encourage, facilitate, and support development and growth of the ICT industry. While the policy is theoretical, the practical success is realised via an ICT Development Implementing Agency to ensure the implementation of the action plan leading to e-Fiji. Effectively, the concept entails two networks, intranet and extranet physically separated for security reasons. The intranet carries information concerned with national confidentiality and the governmental internal office automation, as such is not for public consumption. Whereas, extranet faces public directly, providing various e-government services to the public. Figure 2 illustrates this concept.

Figure 2. IT platform – intranet vs extranet



Source: Ministry of Information, Communications and Media Relations, 2004: 18

The remaining key players are Data3 - a Microsoft Partner residing in Australia, Fiji International Telecommunications Limited (FINTEL),

Amalgamated Telecom Holdings (ATH – TELECOM FIJI, CONNECT, TRANTEL, VODAFONE) UNWIRED, KIDANET, DIGICEL, Investors, private IT sectors and private sectors undertaking back office operations. Players outside Fiji are Australian Government, Japanese Government (Financial Aid), Cisco (initiatives for education), Australia and New Zealand ISPs/Telecoms. It is, as a matter of fact, the government's shares in strategic players and the oversight in early monopolistic licensing that has led to the loss or delay of developments in the ICT industry. A key strategic player, ATH has very heavily and is continuing to invest in the much needed infrastructure to enhance growth of ICT industry in Fiji.

Nonetheless, some progress is evident and cannot go unnoticed. The success of ICT programs is one such relevant factor when noting progress. The outcome of the projects or programs indicates how well the project had been implemented with respect to accomplishing set goals. Success, to a great extent is measured through cost savings. Basically, work processes should become more efficient, secure and reliable. Micro-business efficiency assessment involves fast, timely service (quick turnaround time associated with delivery of services to customers), cost cutting, sales output, customer acceptance, network traffic, increased profit, decreased cost of doing e-business, staff survey, customer survey and improved quality of life. It is also measured by the point of sale machines at supermarkets, resultant being better shopping experience for customers. Further, e-banking is making it easier to pay bills online and to access associated services online. Lack of awareness or lower usage rate in this area could be due to lack of education or a feeling of insecurity when using machines. Fiji's border control at the airports is also more efficient and secure. Exchange of information between departments within companies has become easier. So much so that we are now moving towards consolidating data so that it can be used as the single point of truth instead of having bits and pieces sitting with different departments.

The favourable macro – environment created generates more investment from abroad, increases economic growth and further enhances communication technologies. But this is still a new concept since full implementation is in process. The installation of the Southern Cross cable has

introduced high speed and broadband Internet connection.

Schools are now introducing computing at lower secondary school levels. A number of ministries have information based websites. Introduction of mobile devices such as blackberry and mobile GPS systems has reached our shores. Citizens enjoy access to satellite television with Fiji TV and Pacific Broadcasting Services (PBS). Fiji has direct communication with the outside world with video conferencing and such. National ICT department is creating lots of improvements in the technological sector. Government is now thinking of implementing e-voting system. Essentially, while ICT in Fiji is still in its development phase, all these developments were unheard of, some years ago in Fiji. Fiji's ICT industry is definitely developing in the area of hardware suppliers and technical support services. It was the realisation of government that led to the set up of an ICT Park that instigated the importance ICT played in today's IT world and the benefits developing countries could foresee from IT parks.

Essentially, effective 1 January 2006 for a period of 7 years until 31 December 2012, approved new and existing ICT industries including Software Development and Call Centers will be provided the following tax incentive in the event of significant increase in capacity and the number of employees:

- 80% Income Tax exemption for business employing more than 101 employees
- 60% Income Tax exemption for business employing 60 - 100 employees
- 40% Income Tax exemption for business employing 10 - 59 employees

Further, the importation of computer equipment and accessories (hardware) will be exempted from fiscal and excise duty in an attempt to make these items more affordable and to facilitate growth in IT business and education in this discipline. Software attracts a low levy of 3 per cent. Ten year tax holidays are also available to companies operating in the temporary studio city zone. To date, government has signed off three studio city zones in Suva for Tele-Business Park to be set up within the zone. These are Kalabo Tax Free Zone (TFZ), ATH and University of the South Pacific (USP). More to this, the 2007 revised Budget makes available incentives to investors in Kalabo area whereby: the ICT business location must be in the kalabo ICT Economic Free Zone, employ more

than hundred workers and where 60% of sales is exported. This speaks well on the commitment of current regime towards ICT development. BUT, overall, we are still way behind in terms of development. The good news is that it doesn't seem that far away. We have made some progress despite the common constraints.

It is true that the general public or majority of the population have no idea what ICT is and what it can do for us. This is due to the lack of information provided concerning ICT and also the level of education in this field. Also the way this industry is being handled in Fiji is not up to the standards it should have been²⁷.

A reality check on this industry in Fiji says that, it has not reached the level of success it should have compared to the amount of resources employed for its success. A look at the time and money spent on the resources signals that Fiji is still way behind than most of the developing countries around the world. Development is occurring but is rather slow and not at the speed at which most countries have developed. For one, Fiji is said to have the highest mobile rates in the world. But this is improving, given the recent entry of a competitor – Digicel. Comparatively, Tonga and Samoa have better mobile services than Fiji. While Vodafone Fiji proudly announces that it has attained about 25 per cent of the population as mobile users, they are silent on the fact that they do not have the capabilities to handle that much traffic. Second is the broadband connection in Fiji - the amount of money the public spends for the ISP services is way too high compared to the level of service provided by these sectors. The speed is too slow. The entire nation does not have the range to accommodate the signal. This results in signals being so weak that they advertise it as high speed internet yet it can be compared with dial up. It has been slow but is picking up pace. Progress is largely due to the growing need for access to information and communication using Internet. Undoubtedly, while the demand for ICT skills remains high, the problem is that of retention of highly skilled professionals. Awareness remains a knotty area. Generally, whatever developments and innovations eventuate in Fiji, are only known by people who are actually working in the industry. It cannot be denied that a proportion of Fiji's population do not get proper education. Because of this, they are also seriously computer illiterate. Many don't have access to

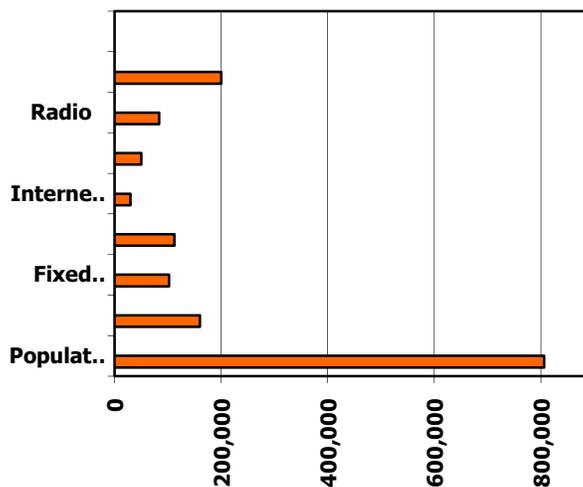
internet. Still many do not have computers at home. With respect to education and training, computer literacy at pre-tertiary level is rather low, especially in rural areas due to very limited access to computers. Table 1 and Figure 3 illustrate these statistically.

Villages	Households	Population	Provided Access	Percentage
1,671	73,168	415,582	950	56.83
Division	Villages	Households	Population	Provided Access
Central	400	14,295	82,979	250
Eastern	274	6,936	37,02	189
Northern	428	17,835	109,465	213
Western	569	34,103	186,114	298

Table 1, Rural telecommunications
November 2003

Source: Ministry of Information, Communications and Media Relations, 2004: 37

Figure 3. Sector statistics
General



provisions of the Posts and Telecommunications Decree 1989.

Source: Ministry of Information, Communications and Media Relations, 2004: 34

With the progress to-date, what have been witnessed overall are: the introduction of networked systems, serious computerisation of public and private services and higher speed Internet access. But progress is very much hindered by political upheavals and lack of resources in terms of both finance and labour. Skilled workers continue to leave for greener pastures. The monopoly status enjoyed by the ISP further hinders ICT growth. Now, given that competition is lacking, service providers enjoy profits at the expense of the public who have no choice but to accept services at higher prices, that is those who can afford such services. Lack of education as mentioned prior also hinders growth. Computer literacy has only increased recently but there still exists a vast gap. Funding is yet another of the bigger issues. Fiji as it is, as a nation is stringent on all expenses. Given the December 5 coup, assistance from some donors is also not forthcoming which aggravates resource availability. Other hinderances include problems associated with deregulation of the market, IT staff salary and poor public awareness on automated systems and services.

Even so, all is not at odds. Fiji did come up with the following objectives specific to telecommunications²³:

- To consolidate and amend the law relating to posts and telecommunications.
- To abolish the exclusive privilege of government regarding telecommunications.
- Constitute a new regulator, Telecommunications Authority of Fiji (TAF), providing for its operation, amends and consolidation of the law relating to telecommunications and radio-communication.
- Transfer to TAF most of the functions at present conferred on the Minister as regulator and repeals and re-enacts with minor modifications as to language relevant

communities such as schools, villages, government, public and private sector are required. Fiji Institute of Technology and the USP do offer various IT related training, yet, this is still insufficient compared to the demand for IT professionals. To fill this training gap, there are also a number of private sector firms which provide training but there is a need to establish quality of such training. Further, there are other technical institutes which provide specialised training in IT/IS and also run specific programs as per client specifications. Opportunities are many and do exist for and in this industry.

There will definitely be a huge demand for IT graduates in the years to come given the ICT projects lined up for the coming years. They might even command their desired salary. This will somewhat curtail IT 'brain-drain' as IT experts experience job satisfaction. Job opportunities created in this industry will lead to positive rippling effects on the economy - economic growth. Should international companies be willing to outsource part of their projects to Fiji, this will bring in revenue to the country instead of Fiji having to outsource most of its ICT projects as has been the case in the past years. With appropriate funding and skilled personnel, ICT can be developed in both public and private sectors in Fiji. New technologies should be explored to improve on the current ICT standards.

Key findings

There is consensus between the interviewees on the 'age of ICT sector' in Fiji. All agree that, Fiji has progressed though in a slow fashion (due to mentioned constraints). Fiji has just but passed the infancy stage and remains 'green', it is yet to achieve much more. There is also agreement on the major constraints of high costs given the monopoly status of Telecom, lack of public awareness on the importance of this sector, difficulty in retaining highly qualified personnel, financial constraints (this is no surprise given the tight country budget Fiji is employing at present), political developments which affect donor country aids to Fiji, training schemes and costs of latest ICT mediums which are generally not that affordable to many especially in the rural areas. That being said, Fiji is still at the forefront of ICT development when compared to her regional neighbours and this is

mainly due to the double blessings of being at a centrally ideal location and also having the Southern Cross cable and relatively good infrastructure at its disposal.

Conclusion & recommendations

This research in particular focussed on the progress in Fiji's ICT industry until now. The preceding commentary indicates that Fiji has passed the infancy stage but remains very young in terms of general ICT development. Market is neither adequately deregulated nor completely efficient. However, the picture may vary within next seven to ten years if progress is kept at a steady flow and there are no disruptions, particularly socio-political disorder such as the coups Fiji has befallen. These unfortunate events set back technological development by a decade or more, based on its severity. Fiji's ICT sector still has a long way to go and there is a lot of catching up to do. The good news is that, like the previous government, the current regime is also showing its commitment towards this sector. So while we are behind many countries, we can still progress. However, the current constraints need to be handled effectively.

The government objectives on telecommunications are encouraging and signals towards further deregulation. In light of the constraints and the current status of Fiji, it is recommended that a private-public partnership be developed between the government and the private sector. Government through FTIB gives a number of incentives to the existing and the very new in this sector. Conditions included in these incentives can be: companies to assist in general ICT public awareness in anyway they can. As good corporate citizen companies can be asked to run promotional programs in areas where ICT holds little understanding. Companies can also donate computers to schools and institutions as part of the corporate social responsibility (CSR) programmes. For companies that show interest in this respect, state can identify a number of schools particularly in the rural areas that need computers, in such a way that all schools at a certain point in time are equipped. There are certain large multinational companies as well as some NGOs and diplomatic corps which have been actively carrying this out and

it is indeed a positive contribution towards the general development of the ICT industry.

Secondly, since highly qualified people have been leaving Fiji for greener pastures in droves, new students can be given scholarships to study IT in various educational institutes in Fiji after which they be bonded for a number of years and be requested to serve in rural schools with understudies. Still on the educational institutes – such institutes should work together with the Education Ministry and Labour Ministry to identify which degree programs lead to bloated graduates with poor employment prospects and those that Fiji really requires. Together, they can act to balance out student intake in such courses. For instance, there are often complains of excess graduates in the education degree who remain unemployed after graduating. At the same time, there are chronic shortages of IT personnel in different levels and sectors of the industry. The education degree can also be upgraded to incorporate IT knowledge. Fiji can also explore how it can best maximise from the dot com phenomenon as has been done by the government of Tuvalu which holds exclusive rights to the domain TV and this has been leased by them to various companies who pay millions of dollars a year to administer and sublease the domain. This is an example of how a Small Island Developing State (SIDS) in the region has exploited a niche area in this very dynamic and young industry.

Third, companies which now go online should run one-off awareness programs throughout Fiji as part of their CSR programmes. It is one thing to come up with an e-location which gives the general public some idea on a company's scope of work, it is entirely another issue whereby the users actually know how to use the e-site. Many types of interface should be made available online and the experience to the visitor must be maximised. Some companies, such as Fiji Water, Pure Fiji, Vodafone Fiji, etc... have invested a lot of time and money to ensure that their respective sites do this. It does not make sense to have an e-site where customers still have to visit the company premises for more information, to request and to fill out a number of forms. Instructions should also be simple for clear understanding. It is also noted that the senior citizens are not that comfortable while 'talking on or to machines', they are more at ease with human contact. But this is not something confined to only senior citizens of the region, it also afflicts many who

fall in the Generation X category. It might be a little too ambitious but for Fiji to become e-Fiji, it should also take this group into account whereby, certain educational institutions can offer crash courses on the very basics of computers/use of internet only for this group. Once again, due to cost constraints on the state, this may require private, public and educational institute partnership. In this way the different parties share costs, resources and in turn also benefit from each other. Government can assist in terms of incentives offered to such institutes and the private sector while such sectors assist the government in moving the ICT sector forward.

What this will quintessentially attain over a sustained period is a highly versatile and technologically competent populace, where there is empowerment through knowledge and education via the mediums of the ICT industry. A succinct advantage of this would be holistically harmonious environment in which business and the state can mutually thrive. Another recommendation is that there is a need for more drive and investment in the ICT sector from all stakeholders in order to transform the current niche form status to one which can be a nationally realised sector – accessible to those who seek it. This could be facilitated via ICT parks (which is being advanced by the state and the private sector), tax concessions and incentives to companies which venture into this industry with strong CSR programmes aimed at expanding the sector.

Essentially, Fiji still has a fair way to go insofar as its fledgling ICT industry is concerned. It is important that ongoing research on similar topics be conducted to contribute to its progress. Such continual research will keep creating better understanding and enhance new knowledge as well as reflect on policies as Fiji gains maturity in ICT.

Organisation	Production Computers	Admin. Computers	Internet Computers	Computers 3+ Years old	Broken Computers
USP	1200	500	1000	300	20
Fiji TV	3	49	34	31	1
Archives	0	5	1	5	1
Museum	6	6	1	4	0

First, a similar analysis can be undertaken after seven or ten years to note progress – periodic

research. Given that the sector of ICT is very much in the making, in seven to ten years time, the stance will be much different from its earlier state of affairs. Second, a comparative study can be undertaken between island nations. This will help uncover the approaches taken by different islands and help reveal complexities, similarities, differences etc... The scope of this kind of research may be too broad but can be narrowed down to observe specific elements such as the role of government in developing the sector.

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Appendix 1. Fiji*: Country Report

* The survey was completed by four organisations: The University of the South Pacific, Fiji Television, Fiji Museum, and The National Archives of Fiji.

A. COUNTRY INFORMATION	Population: 775,000
B. ICT EQUIPMENT	
Access to Internet Services	Access to the internet is less than 25% of the population at all access points. The exception is the office environment which is between 25 and 50% of the population
Connectivity	Telephone, Fax, e-mail, and WWW are used by all of the organisations greater than once a day. Audio-conferencing, video-conferencing, and V-SAT terminals are used greater than once a day by the University but used only occasionally by the other organisations. PEACESAT are never used. The University and the Fiji Museum use low speed data connections greater than once a day while the other organisations do not use them at all. The University also uses a high speed data connection greater than once a day. No organisations use LEOS satellites
Computers	

Organis ation	Total staff	Staff Confident with ICT and Computers	Staff Recently Trained	Staff Learning Computer Skills on Job
USP	800	750	60	10
Fiji TV	65	65	0	65
Archives	19	10	3	3
Museum	22	17	0	15

Pages	Three of the four respondents to the survey - USP, Fiji Television, and the Fiji Museum - have a home page on the Internet
Staff Usage of Internet	USP, Fiji Television, and the Fiji Museum have more than 75% of their staff using e-mail in their work. USP also has more than 75% of staff using the internet. For Fiji Television and the Museum between 26% and 50% access the internet. Listserve, Usenet, Online Ordering, and Web Publishing are never used. The one exception is the University which has less than 10% of staff using these facilities
Internet Applications	USP: Websites are used for staff and student research. List servers are only used for specific staff and student groups. Fiji Television: Mostly news and current-affairs related sites.
Staff Training	

C: E-GOVERNANCE

ICT Equipment and Services	No figures have been supplied.
E-Governance Applications	The Internet is used to provide a list of government agencies, national statistics, national events, regional events, and for the counting of election votes. The Museum also uses public access kiosks and allows ordering online
Government Initiatives	A seminar on E-Governance has been organized by the Ministry of Information in Suva
Government Websites	www.fiji.gov.fj is a government website offering general information
ICT Policy	fully implemented ICT policy, but respondents did not know if central Government had one.
Access to Government Services	archives of Fiji advise that training of public officials takes place and that ICT is reinforced through training institutes and universities
Government Access	The following departments use faxes, e-mail, and the internet: Administrative, Economic Development, Education, Electoral, Foreign Affairs, Museums, and Police. All other departments use faxes and e-mail
Legislation	Fiji has some Copyright law in place
Inhibitors	The cost of Internet Services, slow connections, a lack of digitised government information, equipment costs, and the ownership of Telecom services have been cited as major inhibiting factors in the development of e-governance Other factors identified include a lack of political and staff awareness of the opportunities presented by e-governance

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