JAPAN PACIFIC ICT CENTRE & ICT FOR HUMAN DEVELOPMENT & SECURITY AT USP

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Abstract: The South Pacific Region has many problems related to environmental and economic issues. The University of the South Pacific (USP) is an ideal platform for provision of development of Human Resources and enhancement of Human Security in the Pacific. Main objective of Japan Pacific ICT Centre is to build human-resource for ICT capacity development all across developing countries in the south pacific while "bridging the digital divide". Main Goal was to provide USP with appropriate resources to take the lead role in driving the Pacific through Human Resource Development Programs. Specific Goal is to focus on developing and strengthening ICT skills applicable at the e-services level. The author discusses the development of new Japan Pacific Information Communications Technologies (ICT) Centre at the University of the South Pacific and ICT for Human Development and Security in the South Pacific Region. USP motivation was to accommodate increasing demand for ICT-related education and training in the region and to accelerate research and development activities in the Pacific. The Japan Pacific ICT Center will play a facilitator role for ICT related education, Training; and Research and Development for the Pacific. Japan Pacific ICT Centre will promote innovation and development in the areas of e-Learning, e-Health, e-Government, e-Journalism, etc. The Centre will support software development in the areas of Web 2.0 combined with the 3D Telepresence, Future Internet, Semantic Web Technologies to support creation of social networks, content retrieval and analysis. This will contribute towards the research and innovation in the areas of future fully automated cyberspace. Current dynamic Internet developments and continuous demand for the ubiquitous connectivity combined with the next generation of networks contributes towards creation the future cyberspace infrastructures worldwide. Implementation of the cyberspace in the government and corporate infrastructures, contributes towards creation of new paradigm in the decision making processes. Decisions that are currently governed by the human intelligence knowledge and intuition may be influenced by the cyber-data and processes. Future cyberspace will ultimately impact the decision making processes by government, corporate, industrial and academic institutions worldwide. In conclusion the author promotes discussion on the role of the Japan Pacific ICT Centre at USP and in the Region. The author opens discussion on Japan Pacific ICT Centre social and ethical impact in the south pacific region in the context of governance vs. privacy.

Keywords: Japan Pacific ICT Centre, Human Development and Security, Future Cyberspace, ICT Technologies, Governance, Security, Privacy, 3D Tele-presence, globalization, Information Technology Age, Future-Net, Next Generation Internet.

I. INTRODUCTION TO USP

The University of the South Pacific is the premier institution of higher learning for the Pacific region, uniquely placed in a region of extraordinary physical, social and economic diversity. Established in 1968, USP is one of only two universities of its type in the world. It is jointly owned by the governments of 12 member countries: Cook Islands, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu and Samoa. The University has campuses in all member countries. The main campus, Laucala, is in Fiji. The Alafua Campus in Samoa is where the School of Agriculture and Food Technology is situated, and the Emalus Campus in Vanuatu is the location for the School of Law. The

academic Schools, Institutes and Centers at the University of the South Pacific are organized into three faculties and led by Deans. These are: the Faculty of Arts and Law; the Faculty of Business and Economics; and the Faculty of Science, Technology and Environment. Each faculty comprises of a number of schools which offer a wide range of academic programs and courses at the undergraduate and postgraduate levels. The University also offers programs through distance and flexible learning in a variety of modes and technologies throughout USP's 14 campuses [W1].

Advanced communication technologies through *USPNet* are used to reach distance and flexible learning students across the vast expanses of the Pacific Ocean. The multi-cultural nature of the staff and student body give USP an exceptional character. It is a quality institution producing degrees comparable to those awarded by universities in Australia, New Zealand and the United Kingdom. Graduates from USP are found in important executive positions throughout the public and private sectors in all member countries and in numerous countries around the world. The University has set a high standard for quality in its research. Major research commitments include business management, teacher education, Pacific studies, marine studies, agriculture, science and technology. In the first section author introduces USP and its history. In the second section author presents USP region and USP administration. The third section discusses ICT background at USP. Section four presents project phases of Japan Pacific ICT Centre. Section five discusses ADB-JICA partnership with USP. Section six discusses the ICT current state of the art. Section seven discusses 21st century ICT and author's personal philosophical and visionary comments. The final section eight concludes the article, followed by references and authors brief biography.

II. USP REGION & USP ADMINISTRATION

The University of the South Pacific region spreads across 33 million square kilometers of ocean, an area more than three times the size of Europe. In contrast, the total land mass is about equal to the area of Denmark. Populations vary in size from Tokelau with 1600 people to Fiji with more than 800,000. The total population is about 1.3 million. International airlines flying routes between Australia, Japan, Korea, New Zealand and the United States link a number of the island countries. There are also airlines which service the region. Within countries, inter-island shipping is used to reach smaller islands without air services. Because of its strategic position and facilities, USP attracts eminent scholars and staff from all over the world. USP is governed by its own Council, which includes representatives of the member country governments, academic staff, students, communities and business leaders, the Pacific Islands Forum Secretariat, Secretariat of the Pacific Community, the American Council of Education, the Privy Council, Australia and New Zealand. The Senate is the academic authority of the University, responsible for matters such as teaching and research. The Council and the Senate are served by committees working in such areas as Finance, Human Resource Management and Academic Planning. Other committees deal with special projects and the day-to-day work of the University. The ceremonial head of the University is the Chancellor [W1]. USP's Chancellors have been drawn from the leaders of the University's member governments and include Prime Ministers, Presidents and Heads of State. The Pro Chancellor is Chair of Council and the executive head of the University is the Vice-Chancellor. The Vice-Chancellor is assisted by a Deputy Vice-Chancellor and three Pro Vice-Chancellors. The Registrar is responsible for the welfare of the University community. The Director of Finance is concerned with control of University finances. The Director of Planning and Development plans the use of the University's financial and human resources. In total, USP employs more than 1,500 staff [W1].

III. ICT BACKROUND AT USP

Many member countries in the south pacific region were and are still struggling to take full advantage of benefits from ICT. They lack appropriate ICT infrastructures and do have resources to build proper ICT in their nations. The member countries were unable to use ICT as a strategic tool for addressing socio-economic development issues. USP wanted to become an active partner in the social, economic and political development of its Member Countries. The USP vision was to become a fully global but located and engaged in the Pacific a regional University of excellence. In the final analysis, the USP needed to answer fundamental question:

"Why USP?" The response was based on the well-being of Pacific peoples and their needs. USP has high quality graduates who are getting good employment and possess skills, knowledge, and social and cultural competencies required by employers. USP produces high quality research relevant to the Member Countries and, offers variety of outreach programs while making major contributions to the cultural and economic development of the region.

The USP was an active participant of ICT-related activities including

- Introduction of USP Satellite Network (USPNet) in 2000;
- Becoming a Member of the "Open Learning Health Network" in 2003;
- Enhancing the USPNet in 2005;
- Starting ICT Capacity Building Project 2002 – 2005;
- Adopting the International Open Source Network (IOSN) Sub-regional Secretariat in 2006; and
- Creating the ICT Tax-free zone of the USP Statham Campus in 2006.

IV. PROJECT PHASES OF THE JAPAN PACIFIC ICT CENTRE AT USP

In collaboration with the University of the South Pacific (USP) and Japan International Cooperation Agency (JICA), the "ICT Capacity Building at USP" First Project ended on 30th June 2005, having achieved goals under its various components [W2].

Figure 1: From the Government of Japan [W2]

The Project was launched on 1st July 2002 with a three year implementation period. This section presents project outputs and lessons learnt during the Projects 3 year period at USP. This information and resources was used as guidance for all stakeholders who were interested in ICT developments in the South Pacific. Japan is funding a $30 million ICT centre at the University of the South Pacific Laucala Bay campus. Construction will include:

The centre will serve the needs of ICT to the Pacific region and will house three buildings with facilities consisting administration offices, computer laboratories, classrooms, conference rooms and a multi-purpose lecture theatre all equipped purpose specific equipment. (Source: Pacnews)

Figure 2: Laying the foundation for a brighter ICT future [W2]

Japan continues to play a key role in promoting economic development plans in the region:

"Understanding the difficulties associated, not only with the geographical isolated location of the small island nations, but also with sharp information differential in the Pacific region, Japan acknowledges distance and flexible learning as a more convenient approach in the new ear," Ambassador Yoshizawa said."Japan is hopeful that the new ICT Centre will significantly improve the current information and communication technology education and training functions of USP, which is providing remote island countries in the Pacific with distance education and learning activities using USPNet," he said.

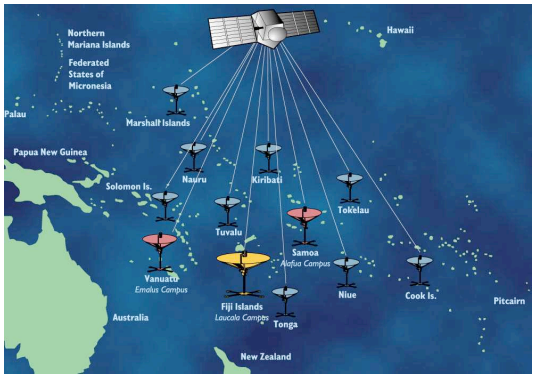

Figure 3: USPNet [W4]

When opened, the center is expected to become a hub for distance learning programs in the region [W2].

The Project was a pioneer project in the ICT arena of academic setting in the South Pacific region [W3]. The project overview was:

- The overall goal was to support USP as a centre of excellence and high standards of human resource development, through an improved educational service in terms of both quality and quantity.

- The purpose of the project was to ensure that more students received a superior educational experience through the enhanced IT capacity of USP.

- There have been four long-term experts from Japan brought in to work closely with USP counterparts on the main components of the project. They were experts in, Computing Science, Distance and Flexible Learning, and ICT Research and Training.

- JICA experts were and are working with USP counterparts for technology transfer. USP Counterpart education includes short term visits to Japan and scholarships including PhD level. Equipment provision is also a key scheme; which included multimedia equipment, computer laboratories, and equipment for USPNet enhancement. Project activities were conducted in USP member countries.

- The Project Office was located at the Laucala Campus with the three project experts plus a team of local staff to assist with ensuring that the project was managed well and operated smoothly.

All 12 USP member countries are expected to benefit from the Project, which is being implemented under JICA's Pacific Regional Programme to utilize ICT for advancing human development and ensuring human security in the Pacific Region.

VI. CURRENT STATE OF THE ICT

The past sixty years have witnessed the most rapid transformation of human activity in history, with digital electronic technology as the driving force. Nothing has been left untouched. The way people communicate, live, work, travel, and consume products and services have all changed forever. The digital revolution has spurred the rapid expansion of economic activity across the face of the planet [1]. In this paper author discuss the unprecedented outburst of advances and innovation in Internet and Information Communications Technology (ICT) that drives the digital revolution today. Authors further discuss how innovation of ICT works, its impact on learning technologies and methodologies, and what forms of communications technologies based on current ICT can be expected in the future. Since innovation does not happen in a vacuum, the author also discusses the current technological and social factors that can accelerate or impede changes in the field of current ICT and future cyberspace. The current trends in globalization create neither a level playing field nor a truly ''flat world.'' [1]. The Governments worldwide are focused on creating best market opportunities while educating and industrializing as quickly as possible in the face of growing competition [2]. Attempts to gain national competitive advantage promote creation of artificial walls that may trigger potential conflicts and disagreements. Today, the Information technology systems are essential for organizations worldwide to deal with current challenges and dynamics in global business enterprise. Information Technologies with Information systems provide firms with necessary communication and analytic tools required to conduct successful business globally. The market is growing and new technologies dramatically improve access to learning resources and offer the potential of linking learners and teachers in completely new ways

[3]. Demand currently exceeds supply in this dynamic new market [4].

Information technology systems are the foundation for services in knowledge economies while facilitating management of knowledge assets and business intelligence. Information systems make it possible for businesses to adopt more flexible arrangements of employees and management that can coordinate with other organizations across great distances [5]. Organizations are trying to become more competitive and efficient by transforming themselves into digital firms where nearly all core business processes and relationships with customers, suppliers, and employees are digitally enabled. The Internet is bringing about a convergence of technologies that is further widening the use of information systems in business and transforming industries and business models. There are five essential key management challenges in developing and using information systems today [6]:

- Obtaining business value from information systems;
- Providing appropriate complementary assets to use information technology effectively;
- Understanding the system requirements of a global business environment;
- Creating an information technology infrastructure that is flexible enough to support changing organizational goals;
- Designing systems that people can control, understand, and use in a socially and ethically responsible manner.

Most of the organizations regardless of nature of business are interconnected via high speed Internet connection and operate in global market with partners from all over the world. The applications of Information Technology are essential to any business, manufacturing, education or government institutions worldwide.

In 2005, the Accenture commissioned its researchers to deeply analyze the entire IT landscape and develop a vision for the future of information technology. The researchers analyzed more than 150 technologies and spent more than 10,000 man hours to generate 42 predictions about the future of information technology [5]. The purpose of the exercise was to re-evaluate our own approach to R&D and to help our clients prioritize their investments in and use of technology innovation to drive business performance. The team concluded that developments in four major technological areas such as:

- intelligent device and sensor networks,
- analytics: distributed intelligence ,
- human to computer interaction, and
- new approaches to system building and integration

As a result, the future of information technology will continue to be driven by above listed areas with research focus on:

- Intelligent Device Integration: As devices gain in diversity, density and intelligence, so does the opportunity to gather knowledge.
- Analytics and Insight: Exploiting emerging data sources for high performance.
- Human Computer Interaction: The impact of emerging technologies and new business needs on workforce productivity and business performance.
- Systems Integration: Exploring tomorrow's enterprise ICT systems.

As a result, in order to facilitate the full-automated processes within the Cyberspace, the Information technology is yet at new beginning of dramatic phase of innovation and developments.

VII. 21ST CENTURY

The 21st century has open new platform for the full automation via ubiquitous cyberspace and Internet. Text published by ComputerWorld [6] reflects the essence of work publishes earlier [7, 8, 9, 10, 11, 12]. For technical clarity the paragraph written in italic print was adopted from [6]:

…In two to five years, autonomic computing will foster technologies such as self-healing software, IT service provisioning, MPP grids external to organizations, root-cause discovery and correction, and self-healing hardware, Gartner says. Between 2008 and 2013, Gartner predicts major innovations such as general-purpose grid computing as well as service billing, service governing and service policy managing systems that shift IT resources to meet business needs at the lowest cost….

The technical development of Internet and ICT Technologies established a platform for the next generation Internet and ICT often referred to as

the 21st century cyberspace. The ever increasing accessibility of connectivity by anyone, to anyone, at any time, at any place from any place to any place ultimately creates a cyber-net and/or cyberspace facilitating creation, manipulation and sharing of information globally by many in real-time fashion. The current cyberspace is already changing the way we work, study, live, socialize, etc. Te future cyberspace will revolutionize the way we live, while enabling automatic real-time visualization and audio connectivity worldwide. The 21st cyberspace combined with the future ICT technologies will drive the e-type applications, such as e-health, e-government, e-security, e-law, e-learning, e-commerce, etc., to the next level of fully automated cyberspace. The 21st century cyberspace will have significant global impact on societies, economies, political and legal structures. Some people may want to ask what will be the 22nd century cyberspace? Will it be safe, human friendly, or will be unsecure and potentially harmful to humans? Answers to these and similar questions will most likely depend on how the global team of scientists, researchers, technology developers, sociologists, educators, thinkers, engineers, lawyers, businessmen, politicians, ect., works together today and will work tomorrow. This may be a good time to start developing ICT and cyberspace related technologies that will contribute towards betterment of live for everyone. Instead of mechanizing the relationship between peoples and nations motivated by economic and/or political benefits of very selected groups.

VIII. CONCLUSIONS

The Japan International Cooperation Agency and the University of the South Pacific officially held a Signing Ceremony, to launch the "ICT for Human Development and Human Security Project" on Friday 30 October 2009. The Project aims to strengthen USP's ability to produce cutting-edge ICT resources for the Pacific region through the introduction of new Computer and Information Science degree programs, enhancing the utilization of USPNet for the delivery of distance learning, and supporting maximum utilization of the new Japan-Pacific ICT Centre as a regional centre of excellence.

Construction of the new Japan-Pacific ICT Centre, a $US 21.5 million (F$43 million), Japanese Grant Aid Project, will be completed in March 2010. Over the course of the three-year project period, several ICT-related experts from JICA will be dispatched to support USP faculty and staff in the Project implementation. Short-term and long-term training opportunities will also be offered, and the necessary equipment provided for the Project operation. The Project cost is around $US 2.8 million (F$5.6 million).

USP graduates from ICT programs will undertake research and development in institutions and industries in the Pacific, and create income generating activities. Community capacity and security in the Pacific could be enhanced through ICT services and USP could become a center of facilitation of international technical exchange.

The principles of current and future cyberspace are based on technological advances and innovation of Information Communications Technologies and Internet. One may ask, what will be the future research and development directions of ICT. Two centuries ago, people did not talk about Radio, TV, Internet, thought they might have think and/or dreamt about it. Today most people aren't surprised by the prediction that the Information Age will probably transform their lives beyond recognition. Let's consider the trends in the development of computers and communications and, most excitingly, the area where they intersect [6]. Three principal Directions of Computer Development are:

- Miniaturization: Everything has become smaller. ENIAC's old-fashioned radio-style vacuum tubes gave way after 1947 to the smaller, faster, more reliable transistor. A transistor is a small device used as a gateway to transfer electrical signals along predetermined paths (circuits).
- Speed: due to enormous large volume of transaction and information processes the highest processing and communication speed is essential in all sectors.
- Affordability: The cost is critical to all business worldwide.

The 21st century cyberspace and ICT technologies have become platform for most of the businesses worldwide. The future directions are as visible as the first transistor was seen then in 1940's. Author's work promotes continuous discussion of individual experts, scientific team of researchers and developers to work, as well as well established multidisciplinary research teams worldwide to define the future directions of future education and to find the optimal solution

for the 21st century cyberspace, next generation of ICT technologies while contributing to betterment of all [9, 10, and 11].

ACKNOWLEDGMENT

Author wishes to express his sincere gratitude to his colleagues at University of the South Pacific for the support provided during this work.

REFERENCES:

[1] Kressel, H*: Competing for the Future: How Digital Innovations are changing the World*, Cambridge Press 2007. ISBN-13: 9780521862905
[2] Donald E Hanna, Higher Education in an Era of Digital Competition: Emerging Organizational Models" , *JALN Volume 2, Issue 1* – March 98.
[3] Davis, S. and Botkin, J. *The Monster under the Bed*. New York: Simon and Schuster, 1994.
[4] Ghazi, K and Irani, I. *Emerging Trends in the $670 Billion Education Market*. New York: Lehman Brothers Education Services, 1997.
[5] ComputerWorld February 8, 2003: *A vision for the Future of Information Technology*, adopted from: http://www.computerworld.com/networkingtopics/networking/management/story/0,10801,84604,00.html last visited October 28th 2007.
[6] The Major Trends that will Shape IT: *adopted from* http://www.accenture.com/Global/Services/Accenture_Technology_Labs/Services/TechnolgyVision.htm: last visited October 29th 2007.
[7] Eduard Babulak: "Future Computing and Cyber Home 2015", *the International Review on Computers and Software (IRECOS),* Print ISSN: 1828-6003, CD-Rom ISSN: 1828-6011 in July 2006 Papers.
[8] Eduard Babulak: "Information Cyberspace and Future Cyberhomes", the *International Journal of Online Engineering iJOE,* ISSN: 1861-2121, Vol. 2, No 2 in May issue 2006 in Austria.
[9] Eduard Babulak: "Interdisciplinarity and Ubiquitous Internet Technologies in Support of Automation", *the International Journal of Online Engineering iJOE,* ISSN: 1861-2121, Vol. 2, No 1 (2006) in Austria.
[10] Eduard Babulak: "Future Automation via Ubiquitous Communications Technologies", the *Journal of Telecommunications and Information Technology,* RSS 2.0 or ISO 8859-2, JTIT 1/2006, Warsaw, Poland
[11] Eduard Babulak: "*Ubiquitous Internet and House Automations*", **invited Plenary Talk,** the IEEE International Conferecne on Telecommunications Systems, Modeling and Analysis 2006 ICTSM2006, October 4-8. Reading, Pennsylvania, USA.
[12] Eduard Babulak: *"Pervasive and Future Computing Domain*", **invited Plenary Talk,** the International Conference on Signals and Electronics Systems (ICSES 2006), 17-20 September 2006, Lodz, Polland

Web sources:

[W1] http://www.usp.ac.fj/index.php?id=usp_introduction

[W2] http://coconutwireless.wordpress.com/2009/01/26/japan-pacific-ict-centre-construction-underway-at-usp/

[W3] http://www.usp.ac.fj/jica/index.html

[W4] http://www.indigenousportal.com/ru/1058-1077-1093-1085-1086-1083-1086-1075-1080-1103/JICA-and-USP-Officially-Launch-ICT-Project.html

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Professor Babulak is international scholar, researcher, consultant, educator, professional engineer and polyglot with more than twenty five years of teaching experience and industrial experience as a professional engineer and consultant. He is Panel Speaker at KIZUNA WINDS Symposium in Tokyo February 2010, Invited Speaker at Yokohama National University, National University of Electro-Communications in Tokyo, Japan in December 2009, University of Cambridge, UK in March, 2010 and 2009, MIT, USA in September 2005 and Expert-Evaluator for the European Commission in Brussels, June, 2007. Professor Babulak is Fellow of the Royal Society for the encouragement of Arts, Manufactures and Commerce (RSA), Fellow of British Computer Society (BCS), Nominated Fellow and Member of the IET, Nominated Distinguished Member & Senior Member of ACM, Mentor and Senior Member of IEEE. He served as a Chair of the IEEE Vancouver Ethics, Professional and Conference Committee. He works as Full Professor and Head of School of Computing Science and Information Systems and Director of the Japan Pacific ICT Centre at the University of the South Pacific in Suva, Fiji. Earlier, he worked as Professor and Head of MIS Depart. in Cyprus, held five Visiting Professorships in Canada (B.C. and Quebec), Spain, in Czech Republic (Prague and Pardubice). His academic and engineering work was recognized internationally by the Engineering Council in UK, European Federation of Engineers and credited by the British Columbia and Ontario Society of Professional Engineers in Canada. He is Editor-in-Chief, Honorary Editor, Co-Editor and Guest Editor. His research interests are in ICT, Future Networks and Ubiquitous Computing and QoS, E-Commerce, E-Health, E-Manufacturing, Human Centric Computing, E-Learning. Professor Babulak speaks 14 languages. Professor Babulak's biography was cited in the Cambridge Blue Book, Cambridge Index of Biographies and number of issues of Who's Who.