Sixth Regional Information Technology Strategies Meeting

FFA Regional Conference Centre
Forum Fisheries Agency, Honiara, Solomon Islands
2nd to 4th June 1999

ITPacNet99

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Other additional Appendices

ITPacNet99 meeting participants

Standing from left: Franck Martin (SOPAC), Al Blake (SPC), Ramesh Chand (FFA), Donita Simmons (FORSEC), Herve Dropsy (SPREP), Timoci Tora (FORSEC), Levi Telii (Government of Tuvalu), Herman Oberli (SI Ministry of Health, Sam Taufao (FFA).
Kneeling from left: Edward Honiwala (SI Fisheries), Mark Borg (UNDP), Norman Kapun (FFA), Johnson Nausi (DBSI), Charles Tobasala (SI Fisheries).

- cost of upgrading and maintaining appropriate system configuration;
- Internet, web and wider public access to information;
- having core application systems in place that users have not been trained to use;
- need for network management tools such as HP Openview and Microsoft SMS;
- availability of technical resources and support;
- funding constraints and the impact on provision of services;
- data management and quality of information;
- remote access in Pacific Island countries;
- security issues;
- educational and training needs;
- development and support of information technology and communication policies;
- bandwidth availability versus new tools and technology systems;
- telecommunication infrastructure, costs and quality of service; and
- universal access, in particular to rural communities.

The meeting recognised that all these areas fall into the two broad categories of policy or technical issues, or mostly both. There was unanimous consensus that policy makers in member countries will find the meeting report more useful if the above areas can be defined as policy, technical or both. The report from the working group that was tasked with this is annexed as Appendix 10.

2.2 REPORTS/STATEMENTS FROM FUNDING INSTITUTIONS

Apologies were received from the World Bank and UNESCO for their absence due to funding constraints, and the Chair made presentations on behalf of these organisations.

The first presentation was a paper on INFODEV by Jacqueline Dubow of the WorldBank, which was presented to a meeting held in Malta in March 1999 on "ICT Strategies for Islands and Small States". It was highlighted that the Pacific Island countries have yet to benefit from such assistance due to their ignorance on the availability of such funding opportunities. "Knowledge makes the difference between poverty and wealth ... Education is more important than ever: high and medium technology goods are more than half of global trade." For further information about the contents of this report, please visit the INFODEV web page at: www.worldbank.org/infodev.

2.2.1 ISOC AND PACIFIC ISLAND PARTICIPATION

The next. presentation focused on the FFA report of INET'98 in July, 1998 that was held in Geneva, .IS appended as Appendix 12. The role of the Internet Society (ISOC) in promoting In~ormatlOn Tech~olo~y .adv.ice in countries like Uganda provide challenges for Pacific Islands trying to grapple With Similar Issues.

~he U~ESCO Report. on the creation of a "Pacific Islands Chapter of the Internet Society" was ~Ts; discussed, and IS appended .a~ Appendix 16. There was unanimous agreement for the ACNET9.9 to speed up this aC!lvlty. A.fter much discussion, the meeting agreed to officiall y ~odr~.tdhe Pa~lfi~ Islands Chapter With a regional perspective. No restrictions will be placed on any In IVI ual wishing to be a member of this Chapter.

The meeting voted and endorsed the formation of an Interim Executive Council for the Pacific Islands. Chapter ?f the Internet Society to be in office for a period of twelve months. The Interim Executive Council members were elected as follows:

- Chair - AJasdair Blake
- Vice Chair - Franck Martin
- Secretary - Donita Simmons
- Treasurer - Norman Kapun
- Coordinator of Standing Committees - Herve Dropsy

The meeting discussed and endorsed the By-Laws of the Pacific Islands Chapter of the Internet Society. The By-Laws are annexed as **Appendix 13.**

Mark Borg of UNDP made a presentation on the SURF initiative and its potential benefits and impact to Pacific Island countries. Some of the key strategies involve doing more with less resources, and recognising the critical importance of having adequate bandwidth to do a worthwhile job. This report is annexed as **Appendix 17.**

3. SECTION 2: ITC STRATEGIES AND DEVELOPMENTS

3.1 THE SOLOMON ISLANDS EXPERIENCE (CASE STUDY)

3.1.1 USER CHALLENGES - COMPLIANCE

FFA's Manager, of Monitoring, Control and Surveillance Division, Andrew Richards made a presentation on the regional Vessel Monitoring System, highlighting the use of advanced technology systems to support the compliance function. The main business problems that had to be addressed were: illegal fishing and under-reporting and mis-reporting of catches by fishing vessels in an area of approximately 30 million square kilometres. A copy of the presentation is annexed as Appendix 20.

3.1.2 USER CHALLENGES - REVENUE DISTRIBUTION

The Manager of the US Treaty administered by FFA, Felix Panjuboe explained how information technology has made it possible for him and a staff of three to manage the activities of a fleet of up to 50 purse seiners and report back to member countries. A crucial part of the work is the distribution of USD 18 million according to the administration needs and where the fish is being caught. A series of different reports such as unloadings, cannery out-turns, catch report forms or logsheets and vessel control positions are processed and summarised to provide member countries with the full picture of the US Treaty operations. There is an obvious need for advanced technology, urgent response time, and quick dissemination of information to member countries. The reports are also presented to member countries for their independent auditing of the work of FFA. In Felix's words, "member countries no longer ask questions during the US Treaty auditing period which implies that the system is perfect".

3.1.3 USER CHALLENGES - MERCY MISSION

Dr Herman Oberli, a specialist surgeon at the Honiara Central Hospital concluded the presentations of User Challenges with his paper entitled "Mercy Mission". Dr Oberli highlighted that in the Solomon Islands, we have a problem of isolation, and at the same time we need the most assistance. Solomon Islands need better communication, immediate assistance, knowledge transfer and improvements to available literature on how to treat patients. Dr. Oberli's presentation is annexed as Appendix 18.

3.1.4 IT STRATEGIES - OVERVIEW OF FFA'S IT ARCHITECTURE

As part of the Solomon case study, FFA's Senior Analyst Programmer, Norman Kapun summarised the FFA IT Architecture, and the main focus on data management. This has resulted in the development of the Agency's Corporate Data Resource (CDR) which is now more than five years old. While advanced hardware and software are necessary, Norman stressed the importance of having appropriate systems that make use of such resources. One of FFA's major preoccupations are the models endorsed for corporate systems development. The paper explains these models and their use by FFA for its application development is annexed as Appendix 14.

3.1.5 IT STRATEGIES-THE FFA CORPORATE DATA RESOURCE

The FFA Database Administrator, Ramesh Chand then followed with a more detailed presentation on CDR, and the integration work that has enabled it to be major business tool for the organisation. The business problems addressed by each system, relevant schemas, security model and uses are clearly explained in a paper annexed as Appendix 19.

3.1.6 TELECOMMUNICATION IN THE SOLOMON ISLANDS

To conclude the Solomon Islands case study, Mr. Mark Flynn of Solomon Telekom Ltd. made a presentation covering a wide spectrum of issues about telecommunication in the Solomon Islands. Mark spoke about two broad issues: the telecommunication licensing (including telephony) and the Internet (with implications of being a monopoly service. A copy of Mark's presentation is annexed as **Appendix 15.**

3.2 YEAR 2000 STATUS REPORTS

3.2.1 FORUMSECRETARIATY2KSTATUS

Towards the end of 1998 work on assessing the Y2K secretariats hardware and software began. A Y2K contingency made up of the Computer Services Officer and the Computer Services Assistant with overall supervision by the Manager Information Services was established in October 1998.

The first task was to inventory all systems and applications as our documented starting point. Three lists were compiled: - list of hardware, software, peripherals, systems, applications and data that could be affected by Y2K dates; list of external systems or organisations (such as public utilities - Fiji National Provident Fund, Telecom Fiji, Fiji Internet Services, our Insurance Brokers, Fiji Care, Banks, Air Pacific, Fiji Electricity Authority, etc.) that could affect our internal systems and a list of vendors, distributors, supplies who could have a direct impact on the Forum Secretariat.

Between November, 98 and March 99 through use of Internet and Technet, product sites were identified and checked regularly for compliancy and patches and fixes and compliancy statements were downloaded. The computer hardware and software in the Secretariat are compliant with various distinctions - those recommended customer action, which include loading software updates or reading documentation; acceptable deviations from Microsoft's standard of compliance; and those pending updates and future maintenance by supplier.

The compliance status of external organisations were sourced out through the use of faxes, letters and the use of the internet. Many of these organisations such as Telecom Fiji, Westpac, ANZ and Bank of Hawaii, Air Pacific, Colonial and Queensland Insurance brokers, are in the process of taking precautionary measures to ensure compliancy.

At this stage, the Secretariat does not envisage any disruptions regarding its computer hardware and software systems. However, we may have problems with regard to external systems over which we have no control.

A survey on the compliance of the automated/embedded systems in the Secretariat is to be completed. In this area, we may simply purchase new systems entirely as we have decided to do with a new PABX system and Call Accounting System.

Testing is yet to be carried on compliant systems and this plus corrective action will be implemented between April-September 1999. The Disaster Recovery Plan will also be updated during this period.

Regular status reports to the Information Management Committee are made; the next at the end of June and September.

Constant re-assessment of products will continue through the year until the end of 1999.

3.2.2 SPC Y2K STATUS

The IT unit carried out preliminary tests on the SPC Noumea LAN over the 1998 Christmas holiday period. These tests, which included roll-over and verification of all critical dates established that no major Y2K problems are expected with the network infrastructure.

Several embedded systems, such as security, fire and telephone systems were identified as risks and remedial upgrades have been implemented to ensure compliance.

Within the user base, one programme has two DOS based programmes requiring verification and both the personnel and payroll systems are due to be replaced by October with Y2K compliant systems.

The organisation has neither the resources nor the capability to assess external risks (power, water, airline, banking failures). A copy of the Y2K report presented to management is included under the section specifically devoted to this issue.

Year 2000 Status report

Secretariat of the Pacific Community: Last Update 03/06/99 8:17

Introduction

This document documents the results of preliminary testing carried out on the SPC Noumea networks over the Christmas closure 1998. The tests were carried out between December ZS" - 31st 1998 and were focused on establishing whether the network services were liable to suffer serious disruption as a consequence of date anomalies due to be encountered in 1999, 2000 and 200 I.

Four critical systems were addressed:

I. The windows NT LAN
2. Microsoft Exchange Mail server
3. RightFAXNT Fax server
4. SunSystems accounting package

Testing involved the following hardware:

1. All WindowsNTservers(l3)
2. Linux firewall
3. Cisco Internet router

BIOS Tests

All servers were downed and rebooted from a DOS floppy running Check2000 BIOS validation software. Two servers reported errors:

- ORCA -finance file server
- HOME - Internal web server

Both of these are based on motherboards running the Award BIOS and reported errors with the rollover from 31st December 1999. Although subsequent Operating system level tests indicated that problems would be unlikely to be experienced by continuing to use these machines, the problem can be avoided by a simple motherboard replacement.

HOME is scheduled to have its motherboard upgraded anyway and ORCA will be similarly upgraded before September 1999.

- Cost: 200 CFP units.

Network Tests

Five critical dates were identified:

Sep 8, 1999 (Sep S" 1999)
Dec 31, 1999 (Jan 1st 2000)
Feb 28, 2000 (Feb 29th 2000)
Dec 3 1, 2000 (Jan 1st 200 I)
Feb 28, 200 I (March 1st 200 I)

The Test procedure was to down all servers and reboot. During the reboot process the date was set to the critical rollover, less 15 minutes using the BIOS. Several staff were used to ensure that the entire network could be rolled over at the same time as some servers can take 5 minutes to boot.

Tests were carried out before and after each rollover to establish whether any systems had failed:

- Send and receive email to and from the Internet
- Post messages to a public folder
- Send and receive automated fax
- Post journal entries to finance system

LAN software

- No anomalies detected.

Microsoft Exchange

- No anomalies detected

RightFAXNT taxing system

• Small anomaly detected with 2 digit display of dates in automated fax macro: Corrected.

SunSystems accounting package

Unfortunately as soon as the date was advanced to 9th September 1999 for the first test, the SunSystems product reported that our license had expired and refused to allow entry to the system. This was in contradiction to the assurances provided by Steve Wall of Lasata during our telephone conversation with Jimmie, where he confirmed that SunSystems had a two year license period.

It seems that this is not the case and that the license will expire one year after installation in April 1999. This problem prevented any further testing on the accounting systems.

Internet connectivityIfirewall

• No anomalies detected

Further Actions

User applications

There was no undertaking to test user workstations during this period. It is inevitable that individual users will experience Y2K problems if they continue to use older software packages that are not Y2K compliant. IT staff have been working with staff in individual programs to assess the level of exposure to non-compliant software. This seems to be a particular problem in the Statistics and demography programs, which make considerable use of older DOS based packages. IT staff will need to work with vulnerable programs to ensure that critical applications are identified and rewritten during the next six months.

SunSystems Account package

Unable to test due to licensing difficulties. Certified as compliant by manufacturer.

Purchase updated telephone accounting system

It has already been established that the telephone accounting system used by Registry to ensure correct budget allocation of call charges is not year 2000 compliant. It will therefore have to be replaced. A recent demonstration was provided for IT and Registry staff to evaluate a French Windows based product specifically designed to interface with our Matracom PABX.

Both the IT and Registry staff were impressed by the product, particularly in its capability to interface with the fax and Sun Systems accounts. Purchase is recommended as soon as possible.

- Cost: 2050 units

Replace payroll system

The payroll system is based on dbase, a program known to be non-compliant. Testing is currently being carried out on a payrol1 system that has been purchased for the Suva office to ascertain whether it is suitable for Noumea operations. If these tests establish the viability of the system then the software will need to be purchased by June 1999.

If the shrink-wrapped software is not suitable a replacement payrol1 will need to be developed in Access by the IT staff or an external consultant.

Replace fixed assets system

The existing fixed assets system is not compliant but is due to be replaced by the functionality of the Sun Systems fixed assets module.

Replace human resources system

The human resources systems at SPC (leave etc) are al1 based on non-compliant dbase systems. These will have to be replaced with a shrink-wrapped or custom designed package.

Replace publications address system

The addressing database used by the publications department for distribution of publications is not compliant. This will need to be re-written in a compliant system, such as MS Access.

Obtain written compliance statements for embedded systems

- Lift
- Fire alarm

Requires EPROM upgrade to be fully compliant. Installed and supported by ERS bureautique.
Cost: 1090 units

- Security alarm

Requires a motherboard upgrade to be fully compliant. Installed and supported by Espace bureautique.
Cost: 2095 units

- Air conditioning

Awaiting compliance status certification from supplier.

Conclusion

Based on the results of the tests carried out over this period we can conclude that there will be no widespread disruption to the network systems at SPC as a consequence of critical date rollover.

Problems may arise due to:

- External events outside SPC's control (power, water, banking, airlines)
- Application errors on individual user machines.
- Significant legacy systems (payroll, publications address database, Human resource management) will be corrected using in-house programming resources and consultants as required. Each project will be evaluated on an individual basis.
- As the fundamental systems in the Suva office are the same as Noumea it can be concluded that the Suva network will not fail. However, testing of systems unique to Suva will need to be carried out.

Status update 3rd June 1999

- All embedded systems in Noum6a office have been upgraded.
- Replacement Noumda PABX billing system has been purchased and is undergoing initial testing.
- Outstanding DOS application programs have been identified in the Demography program. Of ten legacy systems eight have received certification and two remain with status unknown.
- A stand-by generator has been budgeted for the Suva office due to the possibility of power supply problems in Fiji.
- Replacement payroll and HIR systems are yet to be identified (expected June 1 999)
- Suva office requires a replacement PABX system
- Contingency planning to commence as soon as possible.

3.2.3 SOP AC Y2K STATUS

ITU has been waiting the release of SMS 2.0 for its inventory capabilities and his new compliance feature. SMS leverage the total cost of establishing a Y2K status report for SOPAC

Inventory

The latest Y2K compliance database from Microsoft was downloaded and installed in SMS compliance verification system. We prepared 3 reports:

- Hardware inventory including BIOS Version and Processor Type
- Software compliance overall
- Software non compliant by system

These reports are available on our intranet and automatically updated via SMS. It gives a day to day progress to staff and in particular to IT support staff.

Results

The results shows that as of June 1999:

- SOPAC still operates 20% of non compliant hardware system. It particularly includes 2 Servers out of 4.
- The only operating system that shows Y2K compliance and stability is NT server.
- Most of Microsoft products needs upgrade or patches to reach a Y2K compliance.
- Other Software such as MapInfo, ERDAS Imagine have tackled their Y2K compliance status very early and don't need upgrade
- Other hardware such as hub, switches and routers are Y2K compliant. The problem results in GPS equipment where patches have been applied.
- PABX are under Telecom maintenance contract.

Strategy

SOPAC is continually renewing its hardware, and since the beginning of the year the rate of non compliant hardware has been reduced from 40% to 20%. It is expected that by the end of the year, all non compliant hardware will be replaced.

The strategy is also to wait September to fix Y2K issues on Microsoft products as incremental patches are still being released.

SunSystems Accounting software is still under implementation and it is expected that the accounting system will be still in dual book management in January 2000.

SMS will play an important role in automatically applying these patches.

3.2.4 SPREP Y2K STATUS

SPREP Y2K strategy should enable SPREP to be compliant internally. Externally Samoa has a Y2K national task force active. SPREP has also organised in 1998 a Y2K workshop for director of Meteorology services of the region to address the compliance issue especially regarding Emergency System.

3.2.5 FORUM FISHERIES AGENCY Y2K STATUS

The Millennium bug or Y2K bug is a real problem that every organisation/computer user will face at the stroke of midnight, on December 31st 1999. Given the potentially adverse impact of the Year 2000 issues and the limited time in which to address the problem the matter was left with the ITC division to act on. In order to prepare well for this predicted disaster on the eve of the new Millennium, we have taken steps to ensure that our computer hardware and its system clock, the operating system and the major software programs are year 2000 compliant.

Like many other organisations we cannot give absolute assurance that we will eliminate all Year 2000 issues. However, we are committed towards achieving Year 2000 Compliance by the end of 1999. The following actions have been taken so far in getting the Year 2000 Compliance.

Conversion of the CDR Applications for the Year 2000 Compliance.

This part of the work to convert the CDR Applications for the Year 2000 was completed by the end of January 1999, through the work of the consultant who developed the Corporate Data Resource (CDR) with assistance from the lTC, MCS and US Treaty staff who maintain these systems. Although some testing of Year 2000 dates was done and produced the required results, we will never know the real situation until the clock strikes 1 Jan 2000. Further tests will be carried out later in the year. In the US Treaty budget, the Treaty Manager has allocated a small amount for any contingency needs that may come in June this year. The US Treaty Application (VAC) will be the first one to go into real operations of Year 2000 when the next treaty period changes in June, from June 1999 to June 2000. The Regional Register and possibly the VMS Register will have their first real taste of the Year 2000 problem when the next periods change on 1 September 1999. Problems if any may occur earlier as most of our applications have to start using Year 2000 dates long before I Jan 2000.

Finance One Accounting Package Upgrade Project for the Year 2000

This project was initiated during the week commencing 10/5/1999 with a planning meeting between FFA and Technology One Pty Ltd.

The upgrade of Finance One at the Forum Fisheries Agency is being undertaken to achieve a number of objectives. These include:

- A Year 2000 Certified and Supported Financial Management Information System.

- A consistent Microsoft Windows-based user-friendly interface.
- The implementation of the Finance One Asset Management.
- Adoption of functional enhancements to the Finance One product where appropriate.
- A move to Graphical Report delivery.
- Empowering present Finance One users through up to date Training.
- The development ofre-useable Training Manuals to minimise knowledge loss with staff turnover at the Agency.

Personnel from FFA and Technology One Pty Ltd will be involved in a number of these items. In particular, ITC staff will take part in the training sessions with a view to providing a first line of technical support within the Agency, should it decide to adopt such a model.

The following items and estimated timeframes have been identified:

I.	Planning Initiation	May, 1999
2.	Software Installation	July, 1999.
3.	Preliminary Prototype	July, 1999.
4.	Develop Financial/Management Reports	August, 1999.
5.	User Training Program	July-August, 1999.
6.	Customise Stationery	July, 1999.
7.	Client Y2K Testing	August, 1999.
8.	Go Live	August, 1999.
9.	Post Upgrade Review	Not Scheduled.

The above upgrade will involve 31 working days at a cost of AUD$46,500.00.

Checking for all Software for the year 2000 compliance.

The Payroll System

The ITC discussed the requirements of a new payroll which needs to come into operation fairly soon. We do not think a very complicated package or integration with Finance One is a requirement now. The situation with the current payroll system is:

J. Payroll is a FOXPRO package purposely written for FFA.
2. Source code for us to do any changes and write a quick customised system is not available.
3. Current system is stand alone and does not integrate with any other applications.
4. FOXPRO ver 2.0 is not Y2K compliant so there is already a big problem with all systems written using FOXPRO.

New requirements:

I. Standalone system based on an existing package that is simple to operate and is Y2K compliant.
2. Testing and review stage is within the next 2 months.
3. System must be able to write to either a CSV (text file) or Excel 97 file which can be imported into Finance One.
4. It is hoped that the review is done within the next four weeks so that we can find out the options before other work such as Finance One upgrade make most of us all very busy.

Possible Options:

One of the package that we hope to review is MYOB version 8.0 with Payroll System.

Other Softwares:

We are checking other applications for Y2K compliance and where necessary upgrades and patches for compliance are applied. All other known non compliant applications will be replaced by the end of the year with compliant systems.

Checking for all Hardware for the year 2000 compliance.

The ITC staff went around to make sure that all staff affected by the CDR upgrade had the compliant software and correct configurations. It also gave the opportunity to record the hardware specifications of each machine so that it could be determined to be Year 2000 compliant. All the Network Servers are Y2K compliant and all non-compliant Workstations will be replaced by the end of the year. There are only few non-compliant workstations left to be replaced. We are also checking on other embedded systems such as the telephone, fax machines for possible risks. Due to lack of resources and capability it will be very difficult to assess external risks such as power, water etc.

CONCLUSION

It is possible that even with all the assurances from suppliers, failures can happen and despite all our efforts to ensure Year 2000 compliance levels, things can fail, come the I January 2000.

3.2.6 GENERAL YEAR 2000 ISSUES

Agencies reported that they have asked suppliers for standard statements of compliance and many have obliged. Distinction was drawn between the issue of 'compliance', which has a range of meanings, and the more normal statements that indicate the vendor has taken 'all possible steps to ensure proper operation'.

SPC reported that they had been contacted by a US based library requesting a compliance certification from them, which they had not responded to due to concerns about the legal implications of issuing such warranties.

None of the regional organisations has the capacity to address areas of failure external to their organisation and consequently the need for contingency planning was highlighted and organisations were encouraged to consider such issues as staff leave planning, backups, power failures, banking difficulties etc.

Whilst regional organisations have made significant progress on remediation within their own offices, little has been done to address the issue in the member countries. Regional organisations are encouraged to survey their member country contact points to ascertain the level of exposure to Y2K risk.

Due to the minimum level of technical support normally available at focal points a basic bootable BIOS test diskette should be distributed to focal points. Ideally this diskette should store the test results and be mailed back to the regional organisation for analysis.

Lack of resources at member country focal points was highlighted, concluding that even if non-compliant systems were highlighted there would be no change of remediation without external funding. Both the Ausaid Y2K activities and the WoridBank InfoDev program could be sources of assistance in this regard.

ICLARM highlighted the importance of the social side of the Y2K issue in countries where there is very little understanding of the problem, having been approached for reassurance that significant disasters were unlikely to occur and for practical advice. These are often unrelated to computer technology, such as retaining paper copies of all bank statements, telephone accounts and similar measures.

NBSI reported that they had undertaken a substantive Y2K programme but like all banks were exposed due to their continued reliance on COBOL programmes. The meeting re-emphasised that COBOL is considered a live language and that COBOL developments will continue long after the year 2000.

3.3 SYSTEMS AND APPLICATIONS - GENERAL DISCUSSIONS

3.3.1 SYSTEMS MANAGEMENT

All organisations reported that they were overloaded with support issues and were attempting to address the increasing systems administration needs by the use of systems management software. SPC and SOPAC reported success with SMS 2.0, although implementation was still in the early stages.

FFA reported that they had recently opted to purchase and implement a solution based on HP Open View and that this would be installed in the near future.

FORSEC reported that they had installed a HelpDesk software solution based on PRD software, whilst SOPAC had developed one in house based on Microsoft Exchange.

3.3.2 OPEN SOFTWARE

Discussion centred on the rise of Linux and the possibilities of using Open software products for business systems and the possibility of recommending their wider deployment within the region.

Solomon Telekom reported that their experience with the Linux system used to support their Internet service was that it could provide a cheaper option that other platforms but suffered from lack of scalabil ity and support.

SPC and SPREP reported that they had used a Linux implementation for the specific needs of their firewall servers for many years and had found it to be very reliable.

SPC also noted the arrival of several thin-server solutions onto the market, based on Linux. In particular the use of the Qube2 (www.cobaltnet.com) is being considered for the provision of email services in Tokelau, due to its web management interface, small size and very low power consumption. These types of servers might provide cost-effective solutions for small-scale installations around the region.

Major concerns were raised regarding the level of technical support available for Linux, when compared to with widely installed base of WindowsNT networks. USP and other training institutions were encouraged to develop Linux networking courses to increase the human resource available.

The conclusion was that, whilst Linux could not be considered as a wholesale replacement for WindowsNT due to the needs of specific applications, such as SQL, SMS and Exchange, it could be installed as a component of an NT network to provide robust file and print services.

3.3.3 SECURITY

The meeting emphasised the need for a security policy based on the perceived threats to the organisation and related to a cost-benefit analysis of proposed security measures. Organisations have different security requirements and computer and network security must be integrated into security considerations for the organisation as a whole.

User education in areas such as password ageing and non-dictionary passwords was highlighted.

The issue of long-term archiving as distinct from short-term backup was discussed as an issue of importance, several organisations reporting their concerns with burgeoning storage space demands and the relatively short life span of magnetic media for storing corporate records. Optical solutions are being considered but at this stage no organisation has a comprehensive archiving solution in place.

The danger of sending messages in clear text was once again highlighted, with organisations needing to ensure that staffs were aware of the potential danger of sending clear text over the Internet.

4. SECTION 3: ITPACNET FUTURE

4.1 HOSTING

The group took consideration of hosting the meeting in a country where spacc organisations are not located. Various factors such as the organisation procedures may limit it. The use of uSP campuses in various countries was considered. The group recognised that if a country propose to host a meeting it will be acceptable to the group. As an incentive the group could spend some time outside the meeting helping the country to solve various IT problems.

4.2 ATTENDANCE

The group recognises that more non spacc participants involved in IT issues should be encouraged to participate to the meeting and formulate recommendations. The group encouraged observers to contribute to the annual report, by highlighting the observer organisation status in terms of IT issues. The group recommend sending formal invitations to each organisation focal point as well as to the media and encouraged the attendance ofIT Students to future meetings. The group congratulates the government of Tuvalu for sending a representative to this year's meeting and expressed its hope that the meeting was fruitful for Tuvalu as well as the other observers present.

4.3 FORMAT

The group recognised that it should minimise the spacc specific issues during the meeting to encourage the participation of observers in the discussion and that discussion papers should be circulated 2 weeks in advance to minimise the time for the report creation. The group recognised the advantage of being a sub-committee on IT for the SPOCC (now CROP) and would like to open its format to a wider audience, through maybe some organised public debates. The group suggested that the Paci fie Chapter of the Internet Society could run its annual meeting concurrently with the IT-Pacnet meeting.

4.4 FUNDING

The group considered seeking funding for the organisation of annual meetings, but the existing format was settled on, with costs being borne by the hosting organisation. It was thought more appropriate that the group could seek funding to invite representatives from member countries. Donor agencies should be encouraged to fund member countries to attend the meeting. However due to the fact that each participant must individually seek its own funding to attend the IT-Pacnet, it ensures the presence of committed participants.

5. REVIEW OF ITPACNET98 RECOMMENDATIONS

Of all the 34 recommendations formulated in 1998 all were achieved except for the following:

1. IT plans were not produced by all organisations at the time of the meeting, however these organisations were finalising their IT plan.
2. The recommendation to assign a laptop to staffis followed in practice but not contractually. It was decided to modify this recommendation to reflect the reality.
3. Most of the organisations have web libraries of their reports however none are inter-linked.
4. Most organisations are using web encryption security for sensitive data exchange.
5. All organisations have done all reasonable measures to assess the Y2K problem but some have yet to prepare a contingency plan.
6. It was noted that the amount of training from IT-staff to the organisation staff was in regression this year due to lack of resources.
7. The group did not liase with PROMO, it was suggested that instead the group should communicate with the media industry at large.

6. RECOMMENDATIONS OF ITPACNET99

The group made the following 50 recommendations.

6.1 SPECIFIC RECOMMENDATIONS

6.1.1 IT PLANNING

I. Due to the increasing strategic importance of IT in any organisation, it is essential that all organisations have an IT plan.
2. All computer hardware and software acquisitions must be endorsed by IT staff.
3. Recommended that architects make appropriate provisions for IT requirements of new buildings and renovations and that IT management must be consulted during the planning stages of buildings.
4. Careful consideration should be given to the purchase and use of ergonomic furniture or computer peripherals to minimise the occurrence of Repetitive Strain Injury (RSI).
5. In view of the use of a laptop as an essential tool for staff who travel and the reduced level of service problems personal issue entailed, organisations should give consideration to the permanent allocation of a personal laptop to individual staff rather than establishing a pool of laptops.
6. Any IT equipment should have a budget for recurrent cost such as maintenance, support and upgrades along with a depreciation policy for IT equipment.

6.1.2 INTERNET/INTRANET TECHNOLOGY

7. Agreed that SOPAC would continue to develop the Fiji Internet/Intranet Group (FIG) which is now fully operational with ten members. Members agreed that FIG had been successful in raising internet awareness but the biggest problem remains the limited and high cost of bandwidth.
8. Agreed that each regional organisation should publish web libraries; should make available a publication list or the full text of publications on their web site; and should be encouraged to provide relevant hyperlinks to other regional organisations' sites.
9. Savings achieved and the added-value of electronic publication strongly supports the publication of documents on the web. Where publications cannot be distributed free of charge, organisations are encouraged to provide a summary of the document on the web.
10. Recommended that graphic web designers and web publishers should be involved in the construction of web sites. However, they must be advised to take into consideration the low performance of connections in the region. Furthermore Web site designers need to carefully consider graphic design issues keeping the issue of low bandwidth in mind. Text only versions of all web pages should be provided and should first be tested on low speed connections.
I I. Recommended that IT staff should be involved in the design and maintenance of web sites and non-IT staff should be responsible of the content and its updates.
12. Organisations should ensure that their web sites are regularly maintained and updated.
13. Web publication policy should be in conformity with standard organisation publication and information release policies.
14. It should be noted that regardless of how much bandwidth is available it will eventually become limited. It was resolved that each organisation must be responsible for bandwidth management.
15. It is advisable to ensure local involvement in ISP services both at managerial and technical levels.
16. Recommend the use of an Intranet web site for the dissemination of internal information.

6.1.3 PLANNING FOR YEAR 2000

17. Recognising the imminent approach of the year 2000 problem, the group recommends to urgently finalise their Year 2000 compliance procedures and direct their attention to contingency planning.

6.1.4 TRAINING OF IT PROFESSIONALS

18. Resolved to encourage placements/training attachments of IT people, students, student fellowships wherever feasible and to contribute to the training of IT professionals in the region.
19. Recommended the subscription to MS TechNet (Microsoft Technical Information Network) for IT groups as a source of technical information and support. The Microsoft Developer Network (MSDN) is also highly recommended for those organisations undertaking development work in Microsoft products.
20. Recognise the benefit to obtain to IT people a recognised industry professional certification relevant to the work of the organisation such as Microsoft Certified Professional (MCP) and Cisco Certified Network Administrator (CCNA).

6.1.5 INFORMATION DISSEMINATION AND PUBLISHING

21. It was recognised that CD-ROM remains the standard media for data dissemination thus organisations are urged to host a CD Writer. CD-R are preferred against CD-R W for data dissemination due to compatibility concerns. It was also suggested that web sites could be distributed using CD-ROM on request by member countries.

6.1.6 DOCUMENTATION AND PROCEDURES

22. Recommended that organisations should continue to have an operations manual, which includes a current list of approved application software and hardware.
23. Recommends the use of Intranet to disseminate and keep up to date documentation and procedures.

6.1.7 USER SUPPORT

24. Identified multimedia tools as a very cost-effective, flexible and practical solution for training staff.
25. Urged that management policy should endeavour to provide IT training for staff members and that two (2) hours per week is a reasonable standard for organisations to achieve.
26. Urged the management policy should allocate adequate resources to train users to corporate tools.

6.1.8 LIAISON WITH OTHER ORGANISATIONS OR GROUPS

27. Consideration should be given that IT-Pacnet liases with media organisations to promote IT issues to a wider audience.
28. ITPacNet resolved to maintain cooperation with SIDSNET and to encourage their representative and other similar organisations to attend future meetings.
29. Asked that organisations share positive and negative performance reports on their suppliers and products. The group encourages the use of the ITPacNet (IT-PACNET@sopac.org.fj) mailing list as a forum for discussion.

30. In recognition of the limited resources available in the region, the group continues to recommend the consideration of utilising specialised skills within the Group for consultancies, at cost.
31. Recommended that formal invitation to the next ITPacNet meeting should be sent to each organisations focal points to be present as observers.
32. Urged that non SPOCC members and member countries to consider these recommendations for adoption in their own IT Plans.
33. Encourages the wide IT community to attend the next meeting
34. Encourages the wide donor community to assist SPOCC member countries to attend the meeting

6.1.9 TELECOMMUNICATIONS POLICY CONCERNS

35. The group recognises the difficulties faced within the region in formulating appropriate communications policy with the limited resources available to Pacific Island governments. The group recommends serious consideration be given to the provision of a communication regulatory advisory capacity to be established within the Forum Secretariat or other organisation to provide expert, unbiased advice to assist member states in their development of an appropriate regulatory environment.
36. The group recognises the importance of establishing clear measurable objectives for the appropriate development of global information infrastructure. It therefore recommends that the action plan produced as a result of the Forum Communication Policy Ministerial Meeting of April 1999 be supplemented by a practical implementation schedule and encourages the development of similar practical solutions at the country level.
37. Due to limited resources, the group advises when creating country action plan to take model on previously similar action plan such as the French Information Infrastructure Action Plan of 1998 (http://www.internet.gouv.fr/english/sommaire.html)

6.1.10 PACIFIC CHAPTER OF THE INTERNET SOCIETY

38. IT-Pacnet having acted to create the Pacific chapter to ISOC, encourages SPOCC organisations to provide help to the chapter.
39. Recommends that SPC uses its mailing list PIGNet (pignet@spc.org.nc) as a forum for the chapter

6.1.11 SECURITY

40. Recommends that Intranet and Internet Web site should be separate for security reasons.
41. Agreed that security policies must be well documented and that the computer systems should continue to be adequately protected. Further confirmed the importance of virus protection on computer systems and agreed that a secure backup policy should continue to be maintained in each organisation. Particular attention was drawn to the easy access of organisation-wide email addresses (e.g. on web sites) for sending unsolicited email (spam) or viruses.
42. Recommended implementing standard security policies on mail servers especially in regards to viruses and unsolicited e-mail.
43. Organisations are advised to consider security with the publication of databases on the web and wherever sensitive data is to be accessed, public key encryption such the ones provided by Verisign should be used. They should also be aware that without encryption all data, including passwords, are transmitted in plain text.

6.2 HARDWARE RECOMMENDATIONS

6.2.1 GENERAL HARDWARE RECOMMENDATIONS

44. Due to the disproportionately high cost and specificity of docking stations, careful consideration should be given to their purchase.

6.2.2 NEW HARDWARE PURCHASES

45. It is recommended that current proven technologies appropriate for business functions as identified in the IT Plan be purchased and it should provide a minimum functional lifetime of 3 years. The following hardware is recommended.

6.2.3 COMPUTERS

6.2.3.1 Desktops - Personal Systems

The minimum configuration for desktop systems is:

- Processor: Pentium II 300 Mhz minimum.
- RAM: 64MB minimum SDRAM.
- Hard Disk: 4Gb uncompressed
- Monitor: 15" minimum. 72 Hz min, less than .28 mm pitch, 1024x768 resolution, Energy saving.
- Video card: 72Hz at 1024x768 256 colours (8 bit depth)
- 16X CD-ROM is a minimum (with soundcard and speakers)
- TFT screens are recommended for users who spend considerable time using their laptop.

6.2.3.2 Portable Computers

Due to the high or equivalent cost of portable computers and their limitations as compared to desktop systems, the minimum specifications for portable computers is lower than what is required for desktop systems. The minimum configuration for portable computers is:

- Processor: Pentium II 200Mhz minimum
- Two type 11 PC-Card (PCMCIA) slots. Combo cards (modem/ethernet) should be avoided. Two separate PCMCIA cards for modem and ethemet are recommended to allow flexibility.
- RAM: 64MB minimum
- Hard Disk: 2Gb uncompressed
- 16X CD-ROM is a minimum

The group expressed a general positive experience with Toshiba and Compaq laptops, although selection of a particular brand should be based more on local support rather than brand name only.

6.2.3.3 Server

The highest possible reliability is desirable for a network server, so name brands which are marketed specifically as servers, and that are well supported in the region are recommended (Compaq, HP). The minimum configuration for servers is:

- Pentium II 200Mhz minimum
- 128 MB RAM minimum (minimum 64MB SDRAM chip per slot to allow for further upgrade).
- SCSI UltraWide with UltraWide drives or fast IDE.
- 4Gb of usable disk space as a minimum
- DDS-3 tape backup
- RAID 0 (disk mirroring) as a minimum. Hardware RAID 5 as a preferred solution.
- 16X CD-ROM is a minimum

It is recommended that a fully configured server be acquired.

6.3 PHYSICAL NETWORK

Ethernet is recommended for all networks. Fibre optical cabling is recommended as a backbone especially for inter-building and new building connections. All network cards should be 101100 BaseTX compatible. lOBaseT is recommended for LANs. Network cables should be Category 5. It is recommended that careful consideration be given to selecting the cabling contractor.

Switching hubs should be considered for new installations. In the construction of new buildings, it is essential that architects liaise with the IT staff during the planning stages.

6.4 PERIPHERALS

6.4.1 BACKUP SYSTEMS

Backup solutions are essential for all systems. An adequate backup strategy is essential and should include an off-site storage policy. Backup solutions should encompass all critical data resources including messaging systems such as Microsoft Exchange.

6.4.2 POWER CONDITIONING AND UPS

Uninterruptable power supplies (UPS) of adequate capacity are necessary to prevent the loss of data and are especially relevant in countries with unreliable power. All UPS systems should be periodically tested to verify their operation. Hubs should also be connected to UPS. The group recommends that double conversion technology UPS should be used while power boards with spike protection are essential. Use of modem line protection is also recommended.

6.4.3 PRINTERS AND PLOTTERS

Hewlett Packard (HP) printers and plotters remain the preferred choice of printers, with the model dependent on price and performance requirements.

6.4.4 MODEMS

The recommended manufacturer is 3Com (US Robotics). Specific models are recommended as follows: Courier for high end or leased line and a Sportster for lower speed lines. Caution should be exercised in purchasing a V.90 modem as this is a new standard, unlikely to operate in the Pacific at 56k and still exhibits serious incompatibilities between manufacturers.

External modems are preferred. The group cautioned against the difficulties encountered with low price internal modems.

6.4.5 SCANNERS

Hewlett Packard (HP) scanners are the preferred types.

6.4.6 RECORDABLE CD WRITERS

It was recommended that recordable CDs be used in all organisations to distribute data sets greater than 5Mb. It was noted that for data sets greater than 400 MB, writeable CDs may have a recording limitation.

DVD is emerging as a reliable cost-effective distribution medium for large data sets.

Zip and Jazz drives are recommended as secondary methods of dissemination.

6.5 SOFTWARE RECOMMENDATIONS

6.5.1 GENERAL SOFTWARE RECOMMENDA nONS

46. Recognised that urgent efforts should be made to replace the CDS-ISIS library system with a windows based program, which would support CDS-ISIS through import and export routines. This is now a critical issue due to the fact that CDS-ISIS is known not to be Y2K compliant..
47. Several organisations report success in this area using the DBTextWorks products.
48. The group advises users not to purchase any new DOS based programmes.
49. Due to the regular release of software with proven incompatibilities and bugs, the group highly recommends against the installation of first release software. This is particularly important for critical applications such as file servers.

6.5.2 NEW SOFTWARE PURCHASES

50. Recommended that current proven technologies appropriate for business functions as identified in the IT Plan be purchased. The following software is recommended.

6.5.3 SERVER SUITE

Microsoft BackOffice is a cost-effective server solution. Back Office for Small Business may create licensing and upgrade problems.

- Windows NT Server 4.0 SP4 for network servers.
- Due to superior stability and performance, Windows NT 4.0 Workstation is now the preferred workstation platform.
- Windows 95 is recommended for notebook computers due to NT's limited support for portable functionality.
- Linux is now emerging as a cost-effective network fileserver solution that integrates seamlessly into Windows networks. Caution is advised when considering linux for desktop installation due to limited application availability.
- Internet Information Server (nS) provides a cost-effective solution for a web server.
- Linux is highly recommended as a cost-effective platform for firewall and internet applications (RedHat recommended) but organisations intending to use it should ensure that they have access to some Unix technical expertise.
- ArcServe or BackupExec are recommended for Windows NT backup.

6.5.4 APPLICATIONS

6.5.4.1 Office Suites

MS Office Professional 97 (with Service Release 2). It was noted that there is some backward compatibility between Office 95 and Office 97. For Macintosh users, Office 98 for the Macintosh provides compatibility between Office 95 and 97 on the Pc.

6.5.4.2 Database

MS Access is the recommended standard. The issue of compatibility between different versions of Access was highlighted. It is to be noted that MS Access 97 draws less CPU resources while in the background.

6.5.4.3 Web design

FrontPage98 is recommended as an easy to use web design tool. Visual InterDev 6.0 and drumbeat 2.0 are and appropriate choice for more demanding development tasks, such as interfacing with databases.

6.5.4.4 Mapping and GIS

Maplnfo Professional 5.5 is the current standard.
MapBasic 5.5 is recommended if development work is required.

Conversion issues were highlighted as an important consideration that needs to be addressed. However, these issues have been minimised with the recent versions of the software.

6.5.4.5 Utilities

McAfee Viruscan, Norman Anti-Virus (NVC - previously released as ThunderByte) or Norton Anti- Virus are the current standard for virus protection. It is recommended that a subscription to updates (both engine and virus data files) for the relevant operating systems be purchased. Many viruses are propagated very effectively by Internet mail systems and as a consequence it is highly recommended that a mail server anti-virus extension be utilised to stop infection as soon as possible.

For computer maintenance,

- Norton Utilities for Windows 95
- ERD commander is recommended as an emergency NT recovery tool.
- Norton Ghost for disk duplication and installation
- Disk Keeper is essential for defragmentation.
- LapLink is recommended for ad-hoc file transfers
- Quota Manager to prevent system disk overload
- Pkware tools (Pkzip, WinZip) for file compression.
- PowerQuest tools (Partition Magic, Drive Image) as specialist tools.

6.5.4.6 Mail

- MS Exchange Server 5.5 (SP2) is recommended and includes many security enhancements. (anti-SPAM)
- MS Outlook 98 is the recommended client for MS Exchange Server although some incompatibilities have been noted in the Macintosh version.

6.5.4.7 Document Management and Library Software

Fulcrum is recommended for evaluation of a comprehensive document management and indexing system. OME is recommended as a low priced entry level solution.
The group recommended that organisations should consider replacing CDS-ISIS with a more comprehensive windows based library system. Several organisations have decided to utilise DbTextWorks (InMagic) in place of CDS-ISIS. The Forum Secretariat uses the EOS Professional Series.

6.5.4.8 Financial Software

Off-the-shelf application software is recommended as opposed to an in-house development application. Most off-the-shelf applications can be customised. SunSystems is being used by several regional organisations.

6.5.4.9 Publications Software

Adobe Pagemaker 6.5 is the current standard for high-end publications while Photoshop 5.0 is a good complement for desktop publishing. Microsoft Publisher 98 is recommended for mid range tasks. The group highlighted the need to select packages that provide web editing and web management tools such as FrontPage 98.

6.5.4.10 Training Software

Self-training packages are a cost-effective way to train IT staff. MS Press training packages are also recommended.

6.5.4.11 Network Management Software

Systems Management Server (SMS) 2.0 provides integrated inventory, remote control and software distribution services. Use of a network management solution is highly recommended to reduce the significant support costs associated with multi-user LANs.

6.5.4.12 Development Software

Due to Visual Basic being the underlying environment ofthe Microsoft Office suite it is highly recommended as the development environment of choice within the region. Visual Studio 6.0 Enterprise is a comprehensive bundle of development tools that allow production of professional quality applications software in several major languages (InterDev, C++, Vbasic, VJ++, SQL).

APPENDIX 1 - LIST OF MEETING PARTICIPANTS

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APPENDIX 2 - WELCOME ADDRESS

Welcome Address by the Director of Forum Fisheries Agency

- Mr Martyn Robinson, General Manager of Solomon Telekom,
- Delegates, Observers, FF A Staff, Lady and Gentlemen,

It is my pleasure to warmly welcome you all to ITPacNet99, the 6th Regional Information Technology Strategies meeting here in the Solomon Islands. This is the main occasion where Information Technology specialists from the South Pacific regional organisations meet annually to discuss important issues in the field of Information Technology in order to share with one another their experiences; to communicate and work together in improving provision of much needed assistance and advice to island countries.

I am pleased that the Forum Fisheries Agency is able to host this year's event, which has enabled you all to visit not only the Agency's Headquarters, but it has also provided the overseas participants the opportunity to be in the Solomon Islands. It is also a unique chance for the observer participants from the host country, other ITPacNet member nations, international organisations and all present, so that you can share and benefit from this meeting. And while devoting your energies to the task at hand, I certainly hope that you will give yourselves time to enjoy Honiara, its souvenir shops and night life, in particular.

As a sub-committee of the South Pacific Coordinating Committee (SPOCC), the ITPacNet plays a significant role in assisting regional organisations and the Forum countries on Communication and Information Technology issues. I am pleased to see the high calibre of participation to this meeting which clearly demonstrates your interest, concern and willingness to deal with rising IT problems.

It is pleasing to note the attendance of non - SPOCC organisations such as UNOP and we look forward to increased involvement from UNESCO, World Bank and others in future. Information Technology, I need not remind you, affect everyone in their daily life and thus effective regional cooperation is needed to jointly address and resolve whatever problems there may be in order for you to better manage and provide high quality, adequate and timely information to the communities you serve.

There are many important issues covered in your agenda, and they include the Internet, Year 2000 challenges, regional and national strategies, and the objectives of working together with major players such as telecommunication vendors and operators. In that capacity, we are all privileged to have the presence of Mr. Martyn Robinson, General Manager of Solomon Telekom, who has kindly agreed to give us the keynote address and open ITPACNet 1999.

Frankly speaking, Solomon Telekom has been a great asset to FF A and its development efforts, including the Internet and the regional Vessel Monitoring System (VMS) - a satellite based system which, if fully implemented by all 16- FFA member countries, will be used to track down licensed foreign fishing fleets from Japan, korea, China, Taiwan, the Phillipines and the United States, which are operating throughout the Western and Central Pacific region. The level of cooperation and understanding between Solomon Telekom and FFA, over the twenty-years of the Agency's existence, has been magnificent which has allowed us to deliver significant and positive results to the member countries. Together, we manage and work through both the easy and hard issues and agree on common ground. We continue to move forward to further improve this working model of cooperation between service provider and the client which we believe will provide even greater results in the years ahead.

Without further ado, let me proceed to introduce our guest speaker. Mr Martyn Robinson brings with him a wealth of experience to us today, with over 34 years service in the Telecommunication Industry. He has served in the British Virgin Islands, Hong Kong, United Kingdom, Barbados, St Lucia, West Africa, and in the Solomon Islands since January 1992. Given his role in the telecommunication industry, his commitment to Solomon Islands and support for FFA, I feel it is very appropriate that we ask Martyn to explain to us the secret of his success, and to officially open this meeting.

Lady and Gentlemen, Mr Martyn Robinson.

APPENDIX 3 - KEYNOTE ADDRESS/OFFICIAL OPENING

Opening Statement by the General Manager of Solomon Telekom.

IT PACNET 99

INFORMATION TECHNOLOGY PACIFIC NETWORKS YEAR 1999

INTRODUCTION / WELCOME

HISTORY OF TELECOMMUNICATIONS

HOW COMMUNICATIONS RELATES TO **INFORMATION TECHNOLOGY**

IN THE BEGINNING THERE WAS **FIRE** THEN ... **FLAGS AND LIGHTS**

THEN CRUDE REAL DATA SENT DOWN A COPPER CABLE AT ABOUT ONE WORD EVERY FIVE MINUTES **CABLE CODE.** IT WAS ALL THERE WAS AND DID MAKE COMMUNICATIONS ACROSS THE WORLD SORT OF POSSIBLE. THIS WAS THE FIRST REAL DATA TRANSMISSION THAT USED ONES AND ZEROS. LATE 1800S.

THEN CAME RADIO **MORSE CODE.** TRANSMISSION OF ELECTRO MAGNETIC WAVES THROUGH THE AIR.

THEN **TELEGRAMS** BECAME THE NORMAL MEANS OF COMMUNICATIONS.

ALEXANDER BELL AND THE INVENTION OF THE **HUMBLE TELEPHONE.** SOM E WILL SAY THE CURSE OF MANKIND MOST WILL SAY THE SAVIOUR. INSTANT COMMUNICATIONS AND THE BEGINNINGS OF MODERN COMMUNICATIONS WAS BORN.

WITH THE TELEPHONE YOU COULD COMMUNICATE ALMOST EVERY WHERE OVER **THE WIRE, OVER RADIO** AND **COAXIAL CABLES**

DIVERGENCE WAS THE NAME OF THE GAME WHEN THERE WAS A SPECIFIC BREAK BETWEEN THE **VOICE** AND THE **DATA** COMMUNICATIONS.

DATA TOOK THE FORM OF **TELEX** AND **TELETYPE** COMMUNICATIONS AT MODEST SPEEDS OF 50 OR 75 BAUDS. WITH THE PRINTED WORD BEING THE END PRODUCT. COMPUTERS AS WE KNOW THEM TODAY WERE STILL THINGS OF THE FUTURE.

SATELLITE COMMUNICATIONS CAME INTO BEING AND WORKED ALONG SIDE THE **CABLE NETWORKS** TO PROVIDE GLOBAL COMMUNICATIONS

TELEPHONY CONTINUED TO DEVELOP FROM OPERA TOR ASSISTED TO THE DO IT YOURSELF VERSION COMMONLY KNOWN AS **IDD.**

TELEX AND TELETYPE DIED A NATURAL DEATH ALONG WITH TELEGRAMS BUT VOICE EXPANDED AND BECAME BETTER QUALITY. THEN CAME **FACSIMILE.** YOU PUT YOUR PAPER IN AT ONE END OUT IT COMES ON THE

MACHINE AT THE OTHER END BE IT DOWN THE ROAD OR ACROSS THE WORLD.

THE TERMS **ANALOGUE** AND **DIGITAL** BECAME THE BUZZ WORDS. ANALOGUE BEING MULTI FREQUENCY AND DIGITAL BEING ONES AND ZEROS.

THEN THINGS REALLY STARTED CHANGING AND WE HAVE **CONVERGENCE.** TELEPHONE BECAME DIGITAL, DATA WHICH USED TO BE DIGITAL AND ANALOGUE BECAME DIGITAL AND SUDDENLY YOU COULD PUT IT ALL DOWN ONE PIPE MIXED UP.

THE STORY WOULDN'T BE COMPLETE WITHOUT THE MENTION OF THE **MOBILE PHONE,** IT STARTED LIFE AS AN ANALOGUE VERSION, DEVELOPED INTO A DIGITAL VERSION AND NOW FOR A SUBSTANTIAL FEE YOU CAN BE ANYWHERE AND COMMUNICATE TO ANYWHERE IN THE WORLD WITH THE NEW SATELLITE MOBILE PHONE SERVICES SUCH AS **IRIDIUM.**

IN THE MEAN TIME THE OLD COAXIAL ANALOGUE CABLES HAD BEEN REPLACED WITH HIGH SPEED **OPTIC FIBRE** CARRYING LIGHT AS THE MEDIUM FOR TRANSPORTATION OF DATA. THE SATELLITE SYSTEMS HAD BECOME DIGITAL. SPEEDS OF TRANSMISSION HAD BECOME UNBELIEVABLE.

INTERNET DEVELOPED, AS SUPER PIPE CONNECTING ALMOST EVERYWHERE CARRYING COMMUNICATIONS SUCH AS **E MAIL,** CARRYING **TELEPHONY, DATA, TELEVISION, ENTERTAINMENT, GAMBLING** AND **E COMMERCE** BUT TO MENTION A FEW. IN QUANTITIES THAT ARE ALMOST UNBELIEVABLE.

THERE ARE TWO OTHER ADDITIONAL SUBJECTS THAT 1 WANT TO THROW INTO THIS OPENING ADDRESS, FIRSTLY ONE OF THE MORE IMPORTANT FOR **FFA** IS THE **VMS,** VESSEL MONITORING SYSTEM OPERATED BY THE FFA. IT HAS TAKEN A LONG TIME TO GET THIS SYSTEM INTO PLACE, THE TRANSPORTATION MECHANISM OR THE TELECOMMUNICATIONS MEDIA IT USES TO GET BACK TO FFA AND TO THE OTHER COUNTRIES IS NOW OLD TECHNOLOGY. [.E. **PACKET SWITCHING. 1** WOULD URGE YOU TO LOOK AT THE NEW FORMS OF COMMUNICATIONS'ON THE MARKET AND OFFERED BY TELEKOM SUCH AS **FRAME RELA Y** AS THE POSSIBLE TRANSPORT MECHANISM FOR THE FUTURE OPERATION OFTHE **VMS.**

AT THIS IMPORTANT MEETING IT WOULD BE WRONG NOT TO MENTION THE **YEAR 2K** AND THE POTENTIAL PROBLEMS TO ALL OF US. WE HERE IN THE SOLOMON ISLANDS ALL DEPEND VERY HEAVILY ON TELEKOM AND THE TELECOMMUNICA nON SERVICES THAT IT PROVIDES. THERE ARE NO GUARANTEES THAT IT WILL ALL CONTINUE TO WORK WELL, INDEED NO ONE IS PREPARED TO DO THAT, BUT WHAT 1 CAN TELL YOU IS THAT WE HAVE CONT ACTED EVERY MANUFACTURER OF EQUIPMENT THAT TELEKOM USE FROM THE SMALL ITEMS THAT THE CUSTOMER USES TO THE SATELLITE SYSTEMS BUILDERS IN THE SKY. WE HAVE OBTAINED FROM THEM WRITTEN ASSURANCES THAT THEIR EQUIPMENT IS **COMPLIANT.** WHERE IT IS **NOT** WE HAVE TAKEN NECESSARY MEASURES TO REPLACE. WHERE PRACTICAL WE HAVE UNDERTAKEN TESTS ON ALL OUR EQUIPMENT TO CONFIRM WHAT THE MANUFACTURERS HAVE TOLD US IS THE TRUTH. NOW WE ARE CONDUCTING A FURTHER PROJECT TO ADDRESS WHAT IF IT ALL FAILS DESPITE THE WORK UNDERTAKEN.

TELECOM HAS UNDERTAKEN A FULL Y2K COMPLIANCE PROGRAM UNDER THE CABLE & WIRELESS GLOBAL PLAN AND WE ARE NOW CONFIDENT THAT WE HAVE CHECKED AND DONE ALL NECESSARY TO PUT US **IN** GOOD SHAPE FOR THAT DATE AND THOSE OTHER POTENTIAL RISK DATES.

I HOPE THAT YOU ALL HAVE DONE AT LEAST AS MUCH **!!** BUT 1 HAVE DOUBTS REGARDING SOME OF THE ORGANISATIONS IN THE SOLOMON ISLANDS. FOR

EXAMPLE ARE WE GOING TO HAVE ELECTRICITY ON NEXT NEW YEARS DAY OF WILL IT BE A CANDLE LIGHT DINNER.

TO SUM UP, THE **INFORMATION TECHNOLOGY** AGE HAS BEEN WITH US FOR A LONG TIME, IT HAS JUST GOT FASTER AND CARRIES MORE DATA. IT HAS BROUGHT WITH IT MANY GREAT BENEFITS BUT ALSO THE Y2K PROBLEM.

IT IS ONLY A LITTLE OVER A HUNDRED YEARS AGO SINCE MEN WERE USING SEMAPHORE TO TRANSMIT INFORMATION, TODAY THE AMOUNT OF INFORMATION AVAILABLE AND TRANSFERABLE IS ENORMOUS, 1 HAVE GREAT DIFFICULTY ENVISIONING WHAT IT WILL BE LIKE IN ANOTHER HUNDRED YEARS. BUT 1 AM CONFIDENT IT WILL BE GOING DOWN ONE PIPE CARRYING ALL AND PROBABLY PIPED DIRECTLY TO THE INDIVIDUAL AND IT WILL BE CHEAP.

THANK YOU ETC.

APPENDIX 4 - APPROVED MEETING AGENDAIPROGRAMME

AGENDA

(a) Welcome Address.
(b) Key Note Address/Official opening ofthe meeting.
(c) Apologies.
(d) Adoption of Agenda.

SECTION I: ORGANISATION REPORTS INCLUDING IT PLANNING.
(i) SPOCC Organisations
- Forum Secretariat (Forum Sec)
- South Pacific Applied Geoscience Commission (SOPAC)
- Secretariat of the Pacific Community (SPC)
- South Pacific Regional Environment Programme (SPREP)
- Forum Fisheries Agency (FFA)

(ii) Funding Institutions - moderated session (Sam Taufao).
- UNDP Initiative - Sub-Regional Resource Facility/SIDsNet (on Thursday)
- Others

(iii) Other Observers

(iv) The Internet Society and Pacific Island participation.
- Report on INET98
- Report on ICT (Information and Communication Technologies) Strategies for Island and Small States

(v) General Discussion

SECTION 2: ITC STRATEGIES AND DEVELOPMENTS
(i) The Solomon Islands experience - Case study I, moderated session (Sam Taufao).
- IT Strategies (FFA)
  - Overview of IT Architecture
    Corporate Data Resource
- User Challenges
    "Compliance"
    "Revenue Distribution"
    "Mercy Mission"
- Telecommunication Issues

(ii) Year 2000 Compliance - moderated session (AI Blake).
SPOCC status reports/presentations
- Forum Secretariat (Forum Sec)
- South Pacific Applied Geoscience Commission (SOPAC)
- Secretariat of the Pacific Community (SPC)
- South Pacific Regional Environment Programme (SPREP)
- Forum Fisheries Agency (FFA)

(iii) Other SPOCC Topics.
Alternative Communications Systems and the impact of Low Level Satellite services such as IRIDIUM. - (SOPAC)
Telecommunications outlook for the Pacific Island Countries.

(iv) Systems and Applications - General.

SECTION 3: ITPACNET FUTURE

(i) Purpose and development ofITPacNet - moderated session (Franck Martin).

(a) ITPacNet 2000 and Beyond
(b) Objective for ITPacNet
(c) Framework for ITPacNet
- its future
- its participation
- funding
(d) Recommendations

(ii) Review of the Recommendations from ITPacNet98 - moderated session (Franck Martin).

(iii) Recommendations from ITPacNet99 - moderated session (Franck Martin).

(iv) Group Demonstrations/Presentations of Vessel Monitoring System (VMS).

SECTION 4: ADOPTION OF REPORT

(i) Adoption of report.

(ii) Meeting closes.

Meeting Programme

Focus:
Exchange information and experiences on effective and standardised Information Technology and Data Communication Application Systems that support the Business needs of Pacific Islands Countries.

Wednesday 20d June

0900 - 0910	Welcome Address Victorio Uherbelau, Director, Forum Fisheries Agency.
0910 - 0930	Keynote Address/Official Opening, Martyn Robinson, General Manager, Solomon Telekom, Solomon Islands.
0930 - 1000	
1000 - 1015	Apologies/Adoption of Agenda! Administrative Issues

Section 1: Organisation Reports including IT Planning

1015 - 1215	*Session* 1. Reports from SPOCC (20 minutes each) - FORUMSEC, SPC, SOPAC, SPREP, FFA
1215-1330	
	Session 2 Reports/Statements from Funding institutions - moderated session.
1330 - 1350	UNDP initiative - Sub-Regional Resource Facility/SIDsNet (on Thursday)
1350 - 1410	*Session* 3: Reports/Statements/Comments from Observers
1410 - 1500	*Presentation* 1: The Internet Society and Pacific Island participation. - Report on INET98 - Sam Taufao, FFA. - Report on ICT (Information and Communication Technologies) Strategies for Island and Small States, Sam Taufao, FFA.
1500-1530	
1530 - 1630	*Session* 4: General Discussions on matters arising from any of the above.
1730 - 2030	All participants invited to a function at the FFA Social Club

Thursday 3rd June
Section 2: ITC Strategies and Developments

0830 - 0910 *Presentation* 2: The Solomon Islands experience - Case Study One
(a) **IT** Strategies (FFA)
- Overview ofIT Architecture
- Corporate Data Resource

0910 - I000 (b) User Challenges
- "Compliance"
- "Revenue Distribution"
- "Mercy Mission"

1000 - 1030

1030 - 1100 *Presentation* 2 *continues* ..
(c) Telecommunication issue - Mark Flyn, Solomon Telekom.

I 100 - 1215 *Session* 5: Y2K Status reports (20 minutes each).
FORUM SEC, SPC, SOPAC SPREP, FFA

1215-1330 [illegible]

1330 - 1415 *Session* 5 *continues:* Y2K Status reports .....

1415 - 1500 *Session* 6: Round table discussions on matters arising from the Y2K Status reports and issues arising from the discussions.

1500 - 1530

1530 - 1550 *Presentation* 3:Alternative Communication Systems and the impact of Low Level Satellite services such as IRIDIUM - Franck Martin

1550 - 1610 *Discussion:* Telecommunications outlook for the PICs, experiences and developments in the island countries regarding the ever-changing developments in the region.

1610 - 1700 *Session* 7: Systems and Applications - General
- Systems Administration - principles, experiences, procedures, tools, recommendations.
- The rise of Open software (Linux) - what do we think? Is it ready to be widely deployed in the region?
- Security, and in particular viruses and denial of service attacks (eg. Melissa)
- Workflow applications developments .

Friday 4th June

Section 3: The ITPacNet Future

0830 - 0930 *Session* 8: Purpose and development ofITPacNet - moderated session.
(a) ITPacNet 2000 and beyond
(b) Objective of ITPacNet
(c) Framework for ITPacNet
- its future
- its participation
- funding
(d) Recommendations

0930 - 1000 *Session* 9: Review of the recommendations from ITPacNet98 - moderated session.

1000 - 1030

1030 - 1215

Session 10: **Recommendations from ITPacNet99 - moderated session**

1215-1330

1330 - 1500 *Session* 10 *continues:* Recommendations from ITPacNet99 - moderated session.

1500 - 1530

1530 - 1600 *Session* 11: Group demonstrationfPresentation of Vessel Monitoring System (VMS) - MCS Division, FFA

Section 4: Adoption of Report

1600 - 1630 *Session* 12: Adoption of report
Session 13: ITPacNet2000/Meeting Closes

1730 - 2200 All participants invited to the FFA Social club

APPENDIX 5 – FORSEC STATUS REPORT AND IT PLAN

FORUM SECRETARIAT

Introduction

Since December 1995 several sections related to information management were amalgamated into the ***Information Services*** section within the Corporate Services Division. Information Services comprises Computer Services, the Library, and Records Management and in October 1997, responsibility for the PABX system, voice communications and the satellite television system were added.

Since its last attendance at the Regional IT Strategies meeting in 1998, several developments have occurred in the Information Services section. Our former Computer Services Officer, John Kamea left the Secretariat at the end of February 1999 to join Central Queensland University as a lecturer. Our new CSO, Leone Pedro, formerly NT Network Administrator at the Information Technology & Computing Services (ITC) of the Ministry of Finance, Fiji Government, will join the section on 31 May 1999.

Computer Services

Computer Services delivers a basic array of core services to the Forum Secretariat - install ing, repairing and maintaining servers, desktop computers and peripherals; developing and supporting the local area network (LAN), access to the Internet and the Secretariat's web site; user support, supporting the voice communications system leased from Telecom Fiji; and supporting the satellite television system.

Priorities

In line with the overall objective of the ***Information Services*** section of providing access to timely information for all staff, Computer Services is adopting a client-service approach. The main priorities for IT at ForumSec include:

(1) standardisation of hardware and software including licensing and registration of all software;
(2) improvement of users' computer knowledge through outsourcing of training and;
(3) improvement of computer support services through on-going needs assessment and evaluation of user needs and full help desk facilities.

Current Environment & Network Overview

Presently the current ForumSec network environment consists of a fibre backbone between 8 buildings and IOBaseT ethernet switching to clients using 3Com Superstack II switches, linked to 7 servers (Wiriwiri, Sekoula, Lagakali, Intranet, Kakala, Uci, Mokosoi) that run on Windows NT 4.0 SP4:

- Exchange 5.5 SP2 Email Server, with lIS 4.0 and Proxy Server 2.0, Routing & RAS to FIG;
- SQL 6.5 SP4 server, with Sun Systems 4.2.1-3 for Finance Services;
- Print Server with EOS Professional Series;
- Intranet server for internal web-surfing;
- Sun Systems 4.15 Server, with ForumSec Shared-Data;
- Remote Access Server for dialup from external users (to be configured);
- Software Archive Server for Network installations, with ForumSec Private-Data.

To improve network reliability and reduce disruption to network services, corporate applications and data have been installed on separate servers.

Hardware & Software

The minimum hardware and software configuration for the Forum Secretariat LAN is:

- *Desktop Computers* - DELL Pentium 166, 32MB RAM, 2Gb hard drives or greater, with selected PC's having 64MB and Internal CDROM drives.
- *Portable Computers* - Pentium 133 with 32MB RAM, internal CDROMs.
- *Laser Printers* - Hewlett Packard Family Laserjet 5 and 5si printers, a HP4000TN printer, and HP Jet Direct cards for network connectivity.
- *Client Software* - Microsoft Windows 95 (OEM1 & OEM2) and Microsoft Office Professional 97 (OSR2)

The majority of client computers are 65 DELL Pentium 166's, 32MB RAM, 2Gb hard drives or greater, with selected PC's having 64MB and Internal CDROM drives.; 4 Compaq Pentium 233 's with MMX, 128MB RAM, 3GB hard drives, and internal CDROM drives and 10 Hyundai MultiCAY Pentium II MMX 233's, with 64MB RAM, Internal CDROM drive.

The Secretariat has a pool of 13 notebooks that are available for loan to staff on duty travel - 3 IBM 380 Series - Pentium 133 with 32MB RAM, internal CDROMs; 4 Hyundai Libero Pentium II MMX, 32MB RAM, Internal CDROM; 2 Compaq Elite Pro 486 notebook with 16MB RAM and 4 DELL 433MX 486 notebook with 16MB RAM.

Lagakali, the print server controls divisional-shared printer - 5 HPLJ5si, 7 HPLJ5, 1 HPLJ5 Color, 1 HPLJ4000TN, and 7 Samsung Lazette ML-7000N Laser Printers - via HP Jet Direct cards for network connectivity so that staff in each divisional office on each building level, share a laser printer and have access to two other printers when their default printer is out of service.

Software

The Secretariat has standardised on Microsoft software packages for servers and user workstations.

Client computers are spread over 5 divisions, running Windows 95 (mixture of version A or OEM2) with Microsoft Office 97 (Word, Excel, Access, PowerPoint, Outlook) SR l/SR2 and Network Associates YirusScan. Some computers have specific software such as Page Maker, Project or Publisher. Additional computers are maintained in Computer Services (Help Desk, Call Accounting System - CADS) and the Library (Internet Access Station, CD-ROM workstation, EOS Data workstation).

Backup

The network uses a combination of Backup Exec and Windows NT backup, and the use of a Conner OAT autoloader. Backups are implemented daily on selected servers and stored in various locations at the Forum headquarters and off site.

Security

Network security is enforced within Windows NT via user accounts for Forum Secretariat computer users. Automated daily incremental and weekly full backups are implemented and stored on and off-site. During implementation of the internet connection to the Fiji Internet Group (FIG) Microsoft Proxy Server is used for the protection of the Forum LAN. Other firewall implementations are under evaluation. In early March, Information Services registered itself with ORBs to rectify anti-spamming and relaying of messages through the ForumSec Email Server. For virus protection, Mcafee Netshield and YiruScan are loaded on to servers and workstations, and are regularly updated.

Computer Suppliers, Warranty and Support

The Forum Secretariat purchases from the following suppliers: Bondwell (Fiji) Limited, DATEC (Fiji) Limited, Compaq (Fiji) Limited, EOS International (Sydney, NSW), Lasata Pty Limited

(Western Australia), Pacific Software (Fiji), ProSystems Limited (Fiji), Computer Supplies, Patara Communications, Professional Electronics, Telecom Fiji and SOPAC.

Our main supplier is DATEC (Fiji Limited), the local Dell Distributor. Datec provides computer equipment and after-sales service and support. All Microsoft software is purchased from the local Microsoft Distributor, Pacific Software.

Internet

Since June 1997, a dial-up line to the Fiji Internet/Intranet Group (FIG) based at SOPAC provides organisation-wide Internet access for email and web browsing. The email server is based on Exchange Server 5.5 and clients use Outlook 97. All professional contract staff including some support staff have access to the web. An additional computer with dial-up connection to Fiji Internet Services is setup in the library for staff and public. All staff including auxiliary staff have internet email access. Max Compression has been implemented to assist in bandwidth management for email. A mirror site is setup on the SIDSNET server in the US.

Remote Access Services (RAS) for dialup from external users is currently in the process of being configured and installed for usage by users.

Voice communications

Since 1994, the Secretariat has leased a NEAX 2400 PABX from Telecom Fiji. The current PABX has 27 switchboard lines (Phone 312600) and 16 indiallines (Phone 220<extension number>. It has the capacity for 200 extensions, of which 80+ are currently being used. After a 6 month Voice Mail trial, this development is being reassessed. A review of the PABX system is currently underway.

Satellite television system

In December 1997, the Secretariat upgraded its TVRO satellite system to include connections to the library, PIAD mini-conference room and the residential houses. The following channels are received via the current satellite dish position to the PAS2 satellite: CNN, CNBC, and National Geographic. In addition, the TVRO system receives Fiji TV One.

User Support and Training

Towards the end of last year, Information Services gave up its dedicated computer training room with the Class Master II training system. Because of heavy work commitments, training is being outsourced to local suppliers.

A computerised helpdesk system for on-going user support has been established and will be extended to the Library and Records in the future.

The Computer Systems Officer and Computer Services Assistant attend regular Microsoft Professional training courses offered by Pacific Software and other specialised courses.

Knowledge of IT Trends and Developments

With the on-going changes in the IT industry, Information Services keeps in touch with the latest IT trends and developments through the Forum Secretariat library subscription to numerous periodicals such as PC and Windows Magazine, Microsoft Communique and Australian PC World. IT newspapers such as PC Week and the Computer Edition of each Tuesday's Australian newspaper are also received. Computer books are purchased regularly. Resources on the WWW are also used. Information Services also subscribes to Microsoft Technet & Technet Plus for troubleshooting information, new rroduct evaluation releases and updated monthly service packs.

Future Developments

Planned future developments include:

(a) Increasing of data transfer speed on Forum LAN from lOMBps to lOOMBps
(b) Data publishing to CD-ROM of Forum Secretariat records for in-house access via a CD-ROM server and travel to Forum Secretariat meetings such as the Forum Officials Committee (FOe) meeting.
(b) Review of document flow procedures and implementation of a computerised records management information system.
(c) Continue to improve computerised help desk facility for on-going user support.
(d) Implement RAS for access to the Secretariat LAN
(e) Review and replacement of PABX and CADs systems
(f) Posting of the South Pacific Trade directory on website
(g) Upgrade of library information system to Q Series and making library system online to staff and accessible via internet.

Forum Secretariat IT Plan 1999-2000

The Forum Secretariat Information Technology Plan defines and establishes the Forum Secretariat's directions for information technology planning, development and utilisation and also outlines emerging or developing projects which will expand and/or enhance the Secretariat's current information technology applications.

The Forum Secretariat IT Plan provides a general guide for the Secretariat's future plan and sets out goals and strategies of the Forum Secretariat.

It is the result of a number of consultative processes involving Information Services and the Information Management Committee, an advisory committee with representation from the five divisions in the Secretariat.

It supports the corporate objectives of the Forum Secretariat by improving service delivery to Forum Secretariat staff through the use of IT and making information more accessible through an affordable, shared and widely used IT infrastructure.

The Plan provides a framework for the effective management of information technology in the Secretariat in a more cost efficient manner. It is not intended to limit or stifle divisional initiatives but to provide a stable infrastructure and environment in which to solve common corporate problems and to allow for collaboration on significant efforts.

The document emphasises the planning dimension throughout. A process for review, implementation and continuing revision is included as well a disaster recovery plan.

The plan is not static. In planning for the effective use of IT in the Secretariat, we are aware of the dynamics of change. This plan is flexible and we hope able to address the inevitable changes in our environment.

Vision

To provide the structure and the organisational climate to encourage the orderly, effective and efficient development of IT in the Forum Secretariat and to monitor regional information developments and be available in an advisory capacity to the SPOCC Information Working Group.

Mission:

The general philosophic framework for the continuing development and implementation of this plan are expressed in the following mission statements:

- Improve service delivery to Forum Secretariat staff through the use ofIT.
- Make information more accessible through an affordable, shared and widely used IT infrastructure.
- Use IT to respond quickly to changing business requirements.
- Invest in people, tools, methods and partnerships necessary to improve knowledge and skills of the human resources.

Principles, Objectives

There are three guiding principles for the use ofIT in the Forum Secretariat.

(l) Support the corporate objectives of the Forum Secretariat by providing competitive service delivery through effective IT investments, establish adequate and effective business policies, standards and procedures;

(2) Provide broad access to corporate data to the Secretariat staff for the divisional work programmes by providing the hardware and software for staff that is required by them to effectively and efficiently perform their jobs;

(3) Assist all staff in reaching their full potential through professional development, continuing education and training opportunities by providing a system of ongoing training of all staff in the capabilities ofthe IT infrastructure and in the many uses ofIT to enhance skills and service delivery.

The IT Plan has been approved by Management and it will be a useful management tool in rationalising need for and obtaining funds for developments.

APPENDIX 6 - SOPAC STATUS REPORT

South Pacific Applied Geoscience Commission (SOPAC)

The Information Technology Unit of SOPAC is now divided in two entities to reflect the changes and growth of this SOPAC Unit. The ITU is still part of the National Development programme of SOPAC, but has two main orientations:

- Support,
- GIS and Remote Sensing.

1 Objectives

These orientations reflect the ITU objectives as per SOPAC Strategic Plan for the New Millennium:

"Provide technical support for establishment and maintenance of data management capabilities, and for the electronic exchange of information"

2 Key Performance Indicators

Six key performance indicators have been chosen to reflect how ITU will reach its objectives:

I. Information systems designed and deployed in member countries
2. Internet access implemented in member countries
3. Database with web access designed and deployed to member countries
4. GIS and remote sensing capabilities developed in member countries
5. Computer hardware and software to support internet technologies, databases, GlSI Remote Sensing and modelling installed and upgraded in member countries
6. Appropriate, cost effective and scalable technologies transferred to member countries

The emphasis is clearly marked here to provide greater access to member countries to SOPAC Secretariat information and day to day management.

3 Support

The ITU is responsible to provide support to member countries and SOPAC staff in all the aspect of Information developments. This includes:

- Country visit
- Ad-hoc database development
- Advice in implementing computer networks in member countries
- Design and implementation of SOPAC Network
- Certification program of IT Staff (MCP)
- Web Development

3.1 INTERNET/INTRANET

SOPAC has installed a web for the public and an intranet web for staff only. Both system access SOPAC databases while the later allows the input of data through web interfaces.

3.2 System Management

Microsoft System Management Server 2.0 has been deployed. It helps staff to do remote troubleshooting as well as software installation. Moreover it provides ITU with inventory reports that assess which software is running on which platform. This tool is particularly used to monitor Y2K issues in SOPAC.

SOPAC has now only 30 % of non compliant hardware which is still used. The trend in replacing hardware, shows that all non-compliant hardware will be replaced well ahead of December 1999. Non compliant software has been inventoried and patches will be applied as soon as vendors

stabilises their Y2K upgrades. Because of the Y2K issues and as well as other reasons, all new system purchased are installed with NT4 SP4, the only truly Y2K compliant operating system from Microsoft.

3.3 Finance System

SOPAC has adopted Sun Accounts from SunSystem as well as the reporting tool Vision from Lasata ltd. The implementation phase is about 50% completed. The system should go live in a few weeks with dual book keeping with the old system. lTD expect the system fully operational by the annual session. The system will also be used to create financial web reports for each unit and task.

3.4 Library system

The complete list of reports produced by SOPAC is available on the web, while some of these reports are available in PDF format. The next step is to give access via the web to the map collection database and the library database.

3.5 Task Profiles

"SOPAC patented tool for work program management". Started a few years ago as a tool to inventory the various projects SOPAC and its member countries could undertake, the task profile database has become an important part of the process of establishing SOPAC yearly work program as well as monitoring it. This database should in the future allows member countries to daily monitor SOPAC activities at a country level, but for the moment it is used as an internal management system with country input. The link between the task profiles database and financial system will soon be established to provide reporting on budget and expenses.

4 GIS and Remote Sensing

SOPAC is strengthening its GIS and Remote sensing. Since SOPAC establishment the Secretariat has played a key role in collecting and interpreting key marine data, such as seabed topography, seismic records, and other elements.

4.1 lTV

Since 1995, the lTD has been providing its member countries with ad-hoc GIS technologies to access and interpret data. ITU adopted very early Maplnfo and complemented it by ERDASS Imagine (Remote Sensing), Discover (Geological Tool), Trimble equipment (GPS), Vertical Mapper (Data gridding tool, and raster analysis tool for Maplnfo) ...

Since SOPAC sought the recognition as leading GIS/Remote Sensing Agency of SPOCC organisations two years ago, ITD as been busy to give user friendly access to its GIS databases to its staff and its member countries.

ITU has also developed a GIS Policy paper to facilitate the exchange and management of geographic information inside the secretariat but also with other organisations.

4.1.1 WAGIS

The Wide Area GIS, WAGIS, is an initiative to create a metadata inventory of GIS collections. The system is mainly based on the AustralialNew Zealand experience and follows most of the ANZLIC metadata guidelines.

Please refer to the WAGIS strategic Paper for more information.

4.1.2 PCGIAP

During its last meeting in Suva, the UN based Permanent Committee for Geographic Information in the Asia and the Pacific recognised SOPAC as a sub committee for the Pacific region. The PCGIAP role is to promote the exchange of geographical data and to set guidelines and standard. SOPAC will co-ordinate the Pacific region to ensure that it is represented during PCGIAP meetings. As part of this action lTD has drafted a GIS policy paper for SOPAC. This paper could

be used as a role model for member countries and other agencies. Please refer to GIS and remote sensing Policy paper attached as **Appendix 23**

4.1.3 ITTO Green Labelling

Through a MOU with Fiji Forestry department, SOPAC has been chosen the implementing agency for the International Timber Trade Organisation green labelling system in Fiji. This system should record each log from the cut to the export. Through this system, Fiji should demonstrate that finished wood material are from sustainable forests. The ITTO will then green label Fiji forest industry, opening up new large markets.

4.1.4 PREP Energy grid systems

The Pacific Regional Energy Project had chosen SOPAC as implementing agency for the development of GIS in power utilities. The task was completed in Tonga in a first phase and then in Solomon Islands and Fiji.

4.2 Coastal Unit

The coastal unit has just acquired a RESON multibeam shallow water scanner. It provides the capability to map shallow water areas up to a 300-600m depth at an accuracy level which was previously accomplished by large research vessels. The scanner is transportable and easily mounted on small boats. This scanner starts now to be booked several month in advance by countries.

The data collected is quite large, and requires computer power for processing, but then can be finally easily handled by Vertical Mapper in MapInfo.

4.3 Disaster Management Unit

Formerly known as UNDHA, the disaster management unit provides timely information for the management of disasters. SO PAC has acquired a satellite reception system which collects information from the American Emergency Network. This network covers all of the Pacific. The information collected is freely available on SOPAC web. It includes cyclone location, sea surface temperature, wave direction, earthquake location ...

4.4 Hazard Assessment Unit

The HAU as part of its Pacific Cities project, has developed a GIS system that highlights the various risks for few Pacific cities: Honiara, Nuku'alofa, Port Vila, Suva. This system was developed with MapInfo and provides a classification of risk zones. Extensive use of GPS survey equipment was necessary to map the different objects. Few high accuracy digital elevation models were also produced.

4.5 Water Resources Unit

The water resource unit is testing a water distribution management system that can be linked with MapInfo. Most of the Pacific water distribution systems could supply a larger consumer base if properly designed and maintained

5 FIG

The Fiji Internet Group has been granted a conditional Internet licence, which will allow it to connect to cheaper Internet service providers. The bandwidth available should soon be of significance and allows development of web application for its members. Please refer to the FIG status report.

6 Computer and Network Systems

- RAID 5 Servers: Internet, Exchange/File Server, Intranet/Data provider/Development, SQLlFinance System.
- Ethernet 1011OOTX segmented by switches
- MS-Proxy 2.0 with PPTP enabled for remote Internet connection
- Routing and RAS Server for remote connection

- 7 Software
- MS-NT4
- MS-W95
- MS-Office 97
- MS-SQL 7.0
- MS-Exchange 5.5
- MS-SMS 2.0
- MC-Afee anti virus
- Maplnfo 5.0
- Vertical Mapper
- Geographic Calculator
- Geographic Transformer
- ERDAS imagine
- Arcserve 6.5 Backup with SQL/Exchange agents
- Sun Systems financial suite
- Trimble, Pathfinder and GPS survey
- Hypack Swath processing software
- Adobe Acrobat
- Adobe Page Maker
- Visual Studio 6.0 Entreprise
- CA TNG SNMP software

FIG Status Report

28 May 1999

There has been several communications with FINTEL since the meeting of 13 April 1999 when FIG identified that the cost of Internet access using FINTEL published rates and lease line rates by TFL was significantly more expensive than using the ORION satellite option (prices in USD).

Kbps	FlNTEL	TFL	ORION
64	4,589	7,750	5,000
128	7,860	13,950	6,400
256	13,677	25,110	10,800
512	24,757	45,198	16,500

FlNTEL has stated that they are moving their downlink for Honk Kong to USA and in particular to an MCl gateway. It has been reported that Cable & Wireless has purchased the Internet business unit of MCl that is one of the major communication companies in USA. The anticipated date for the "hot swap" will be first week in June and performance increase is expected as well as a drop in charges. FlNTEL CEO indicated that costs may be still 5% higher than ORION charges but prices are expected to drop through the floor in September 2000 when the Southern Cross cable is connected to Fiji.

The recent change of government in Fiji may allow FIG to revisit the ruling by the regulator that FIG will be granted a licence when it operates as a commercial entity. Even if the ruling is not changed, FIG steering committee should be in position to present a commercial plan to the partners in June.

APPENDIX 7 - SPC STATUS REPORT

Secretariat of the Pacific Community Status Report.

Introduction

This report attempts to provide an overview of the key IT issues that have been addressed or remain outstanding for the IT unit at the Secretariat of the Pacific Community.

Focus

Information technology and Communications has undergone considerable change in the last year, consolidating the development of the Information Technology and Communications Unit, which was formed in early 1998.

The unit currently has 6 full-time staff and one short-term contract staff. Two staff are based in the Suva office, with the remainder in Nournea.

IT Planning

Considerable effort has been expended in the production of a corporate IT plan, intended to provide direction for IT within the organisation from 1999 - 2003.

This is the first plan of its type to be produced within the organisation and its aim to provide a framework for the allocation of resources to Information Technology and Communications. In particular the plan attempts to quantify the benefits that can be realised by appropriate use of Information Technology in return for the very significant resource inputs that are required.

It addresses critical topics such as:

- Staffing levels
- Licensing
- Communication costs
- Equipment replacement
- Maintenance and service contracts

The document will be constantly revised to take account of changing circumstances over the next five years, as in such a rapidly changing field it is inconceivable that such a plan could be fixed for an extended period. However, its initial form provides a framework for Executive management, IT&C staff and others for matters related to Information Technology and Communications.

The practicality of the plan will soon be tested when it is used for the development of the 2000 IT&C budget.

Provision of equitable service

A major principle established by the plan has been the desirability of equitable service for SPC staff stationed in offices other than Nournea. To this end, considerable efforts have been expended over the last year to find a solution to the critical communications restrictions that the organisation faces.

ComET project

SPC Suva is currently linked to the Internet via the FIGNet group, which provides a one tenth share of a I9.2k line, giving an effective bandwidth to the organisation of 1.9k. Monopoly pricing structures in Fiji make Internet access prohibitively expensive, with prices three times higher than they are in Noumea, despite the fact that the cost of living in Noumea is at least twice as high as Fiji. In Noumea a 28.8 kbps link is provided by the local ISP, Ofrate!.

With an office in each location SPC has an overriding need to provide efficient cost-effective communications service between the two sites.

A project was developed to provide communications using the Loral/Orion Orion3 satellite, due to be launched in May 1999, utilising two earth station installations; one in Noumea and one in Suva. Unfortunately, despite management and donor approval, the satellite launch failed and discussions are currently underway to obtain service through alternative satellite providers and it is hoped that the project will proceed within the next two months.

Y2K evaluation

The IT unit carried out preliminary tests on the SPC Noumea LAN over the 1998 Christmas holiday period. These tests, which included roll-over and verification of all critical dates established that no major Y2K problems are expected with the network infrastructure.

Several embedded systems, such as security, fire and telephone systems were identified as risks and remedial upgrades have been implemented to ensure compliance.

Within the user base, one programme has two DOS based programmes requiring verification and both the personnel and payroll systems are due to be replaced by October with Y2K compliant systems.

The organisation has neither the resources nor the capability to assess external risks (power, water, airline, banking failures). A copy of the Y2K report presented to management is included under the section specifically devoted to this issue.

Network status

The SPC offices have embarked on a substantial upgrade of network workstations and as a consequence have practically eliminated 486 machines. Minimum memory configuration in the Noumea office is now 32MB and expected to rise to 64MB, with the Suva office following a similar strategy.

Due to its superior stability, a decision has been taken to standardise on WindowsNT 4.0 Workstation on the desktop, phasing out Windows95. There are no plans to introduce Windows98 and it has been systematically removed from machines delivered by suppliers. A minimum of 64MB has been set as the configuration of WindowsNT.

Trials are currently being carried out on the configuration and use of WindowsNT as a laptop platform; some security issues needing to be resolved.

Expensive support contracts for both Oracle and the Oceanic Fisheries HP-UX UNIX servers have been terminated. lt has been established that client-server functionality can provided at lower cost by MS SQL server, and UNIX services are cheaply available by the use of Linux machines.

Several Linux workstations have now been configured and are fully operational in the fisheries programmes for technical data analysis.

Financial system replacement

In 1988 SPC's financial systems were replaced with a client-server solution using the SunSystems product. This implementation did not run smoothly and hampered the ability of the organisation realise the benefits of this expensive solution. The problems resulted as a consequence of poor project management on SPC's behalf, coupled with poor service on the part of the consultants tasked with the installation.

Substantial resources have been diverted to the system within the IT and finance areas over the last nine months, with the consequence that the majority of problems are now resolved and the organisation is at last starting to see the benefits of a fully integrated financial system.

Development will continue with the configuration of the fixed asset module within the next couple of months.

Workflow solutions

SPC has made concerted efforts towards providing workflow solutions to all staff, with specific emphasis on 'integrated messaging solutions' which endeavour to leverage the power of the Exchange system for more than just mail.

Unfortunately, whilst the solutions are technical successful, the need to divert resources to mission-critical systems, such as the new financial system, has made training of users a low-level priority. The consequence is a very powerful and comprehensive system, which currently only a few staff are able to use to anywhere near its full potential.

Over the next few months it is planned that user training will take place to alert staff to the possibilities available to them.

The key components of the system are as follows:

Exchange server 5.5

Installed in Noumea and Suva offices, providing messaging services to all staff.

Outlook98

Provided to all staff as the standard messaging client. As this stage the Macintosh version retains some functional deficiencies, which hampers its applicability to this platform.

Public folder indexing

Utilises Fulcrum indexing system to allow retrieval of messages based on content, regardless of location and allows the integration of the public folder system within Exchange as a corporate information resource.

Fax integration

Uses the Rightfax 6.0 extension for Outlook98, which permits LAN users to send faxes from Outlook, whilst retaining centralised control and billing functions. Users can send the same message to a mixture of email and fax recipients.

Public folder addressing

Displaying key public folders in the address book allows staff to CC a message to folder, ensuring that a record of important correspondence is retained and indexed.

Replication of public folders

Currently severely constrained by bandwidth limitations, replication of folders between the Noumea and Suva offices allows staff to share joint information resources. The desire for full public folder replication is a driving force behind the search for increased bandwidth.

Systems management

Early attempts to utilise the HP OpenView series of products proved to be unsuccessful, due to instabilities in the software. SPC has a high need for an automated systems inventory and software distribution system, particularly in light of its distributed offices.

Microsoft Systems Management server 2.0 has recently been installed in both the Noumea and Suva offices and shows signs of proving a useful tool in this area, having overcome the poor interface and configuration problems associated with 1.2.

SMS will allow complete and accurate inventory of both hardware and software in use throughout the organisation, and considerably reduce the substantial overhead involved in systems upgrades thereby contributing to an overall reduction in Total Cost of Ownership (TCO).

Anti-Virus

Like many organisations SPC has suffered from severe virus attacks this year, particularly the plethora of macro viruses that arrive daily via email. Fortunately the Melissa virus, as a consequence of previously implementing anti-virus measures, did not affect the organisation.

Based on positive experience with the ThunderByte anti-virus product, the IT unit carried out a comprehensive evaluation of its successor product (Norman Virus Control or NVC). NVC showed itself to be a very capable product, and based on the prompt support received from the developers, an enterprise licence was purchased, which allows installation of all NVC products including: NVC for NT server, NVC for NT Workstation, NVC for Windows95, NVC for DOS, NVC for Exchange.

The use of all components in conjunction provides comprehensive detection and removal at several locations on the LAN, most especially on incoming email attachments.

After initial purchase, we were disappointed with the level of support we received for NVC, and were considering alternatives but recent communication has established that, like many other AV companies, they were snowed under with support requests during the recent hyped Melissa scare and the outstanding issues were now addressed.

APPENDIX 8 - SPREP STATUS REPORT

South Pacific Regional Environment Programme Status report

Mission

SPREP mission is "to promote co-operation in the South Pacific region and to provide assistance in order to protect and improve its environment and to ensure sustainable development for present and future generations"

SPREP aims are mainly to:

- Promote regional co-operation in environmental matters
- Assist members to protect and improve their shared environment
- help members work towards sustainable development for present and future generations.

The activities are organised around 4 Divisions: Environment Management and Planning (EMP); Conservation of Natural Resources (CNR) including Biodiversity; Environment Education, Information and Co-ordination (EEIC) including Capacity Building and IT; and Finance and administration

Staff

SPREP has a staff of about 60 users with at least 57 of them IT users. SPREP has a total of only 2 IT staffs.

Network & Computer System

The park of personal computers is constituted of about 30 desktops and 32 laptops. All professional and travelling staffs are equipped with laptop as their main tool.

All personal computers are connected via a 10BaseT network to two NT4.0 servers which share the load of tasks: email (exchange 5.5), www (internet & intranet), file & printer server, DNS, Finance system, corporate database. On the client side, SPREP uses Windows95 and NT workstation for OS. Other software are mainly Office 97 and Outlook.

IT -related projects

The SPREP internet website was started in July 98 with a mirror site in the US courtesy of SIDSnet.

The intranet site whose development was started early 99, aims at becoming along with the exchange public folder, the gateway our corporate information that is currently stored in either in database, single computer files or even paper based. All SPREP emails (incoming & outgoing) are now stored in a digital registry based on Exchange public folder.

The finance system has been also consolidated based on ACCPAC software, and has provided substantially improved the processing and accessing to financial data.

Training

An attachment scheme has been setup in order to host two SPREP member staff per year in SPREP in the area of IT and clearinghouse. Internally a series of training sessions along with the availability of CDROM-based self-tutorial have improved skill of SPREP staff. Training is viewed as a challenging area to still improve on.

A SPREP IT stafffrom Samoa was sent on a fellowship to SIDSNet during five weeks.

Internet

SPREP has a stable internet connection from one of the two ISP from Samoa, and is looking forward to an increase of the internet capacity nationally. Limitation in term of bandwidth is still a problem to use effectively many internet-based tools.

Planning

SPREP's new headquarter design has included recommendation from IT for cabling and connection, the building is planned to be completed in 2000.

SPREP has postponed the production of its IT vision exercise in order to be developed concurrently and consistently with the new overall SPREP action plan 2001 & beyond.

APPENDIX 9 - FFA STATUS REPORT

Forum Fisheries Agency Status Report

Introduction.

Since the last report to this meeting in 1998, much has changed in terms of staff movement and project developments. Our Satellite Operations Co-ordinator has since been transferred to the Monitoring Control and Surveillance division as the new VMS Support Officer. The Corporate Data Resource Facility has been upgraded to Microsoft Access 97 to ensure year 2000 compliance. More of this will be discussed in the Y2K status report. The Vessel Monitoring System (VMS) has been commissioned and is in full production use. The Forum Fisheries Agency marks its 20th Anni versary this year. These are some of the changes that have taken place and we hope that more meaningful changes! progress is expected this year.

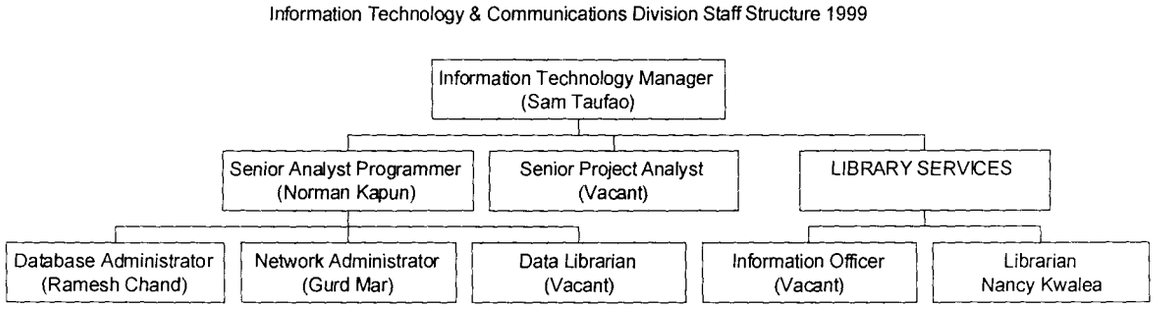
Objective

The FFA's IT objective is to provide an effective information technology and data communication base for the secretariat and to its member countries on a funds permitting basis. This strategy has been reviewed under the new corporate plan. This was done taking into consideration work priorities and funding constraints. Funding constraints still playa major role in the Secretariat deciding on which projects to implement and which ones to defer or not undertake.

Although we would like to implement all projects we are still limited by funding constraints. We therefore have to review our work priorities every year based on available funding and continue the work programme along those limitations.

IT Structure

The Information Technology Division has 4 professional staff and one support staff. This is one short of the number we had last year. It is structured as follows;



The posts currently vacant are Senior Projects Analyst, Data Librarian and Information Officer. Due to funding constraints these positions cannot be filled.

Corporate Data Resource Upgrade to Y2000 compliance

In December 1998, FFA engaged Nesh Petrovic (consultant) to upgrade all components of the CDR from Microsoft Access20 to Access 97. Access97 is year 2000 compliant. The server component of the CDR facility ie. Unix server's operating systems are yet to be made Y2K compliance. This is explained in the Y2K report.

Vessel Monitoring System (VMS)

FFA has achieved a major milestone by signing off the VMS. At this time last year VMS was still in its testing phase. A lot of resources have been commited to this project particularly by IT staff. FFA had to sub-net its network into two logical networks thus separating the secretariat's FFANET

and Vessel Monitoring System's network (VMSNET). This is done to ensure security of data as stipulated by member countries.

FFA Web Development

FFA's website was launched last year. A 20th Anniversary special had been done and is currently being updated. This site is hosted by Must Bscene , a company based in Sydney. Updates of this site are made by them based on material sent to them from FFA. The site is www.ffa.int.

Integration of CDR and VMS

This has been a major success and highlights the flexibility of the CDR model. A logical link has been established between the two networks where each night a nightly cron job on the VMS Unix hosts and downloads all the vessel information from the Regional Register database. This ensures that all vessel details along with related details such as licences, registration, people and organisations maintained by the VMS system is made current. Updates are only done to the CDR side.

Because both databases are oracle, an oracle database link has been established. The download process re-established that link when it is run and facilitates the synchronisation of the VMS data with FFA's CDR database.

Hardware Platform

FFA's hardware platform has been centered on Hewlett Packard products. This has been the preferred hardware vendor and the standard adopted for the Agency and its member countries. The hardware products range from HP 9000 Unix servers, Netservers, desktops and printers.

Toshiba and Compaq have been the preferred laptop computers for a number of years. This focus has slightly changed to stay with Toshiba only after several faults experienced with Compaq laptops.

Corporate Applications

For most of our corporate databases including the CDR and VMS, ORACLE RDBMS is the standard relational database server.

Most applications are client server implementation where the database resides on the oracle server and client applications run from Windows 95 desktops. Data is accessed via oracle's Sql*net and ODBC. Applications that currently run client/server are CDR, VMS, Finance One Accounting System.

Network

The preferred network operating system is Windows NT. TCP/IP is the preferred protocol for network access and clients operating system is Windows 95. Windows 98 and Windows NT workstations are being evaluated for adoption in future.

Office Automation

Office applications comprise of the standard applications ie the MS Office 97 suite including Word, Excel, Access, Powerpoint, Microsoft Exchange and Project. Outside these applications, only Maplnfo (and FFAmaps) is endorsed.

Efforts for 1999

Most of the IT resources will be concentrated towards Y2K compliance as we get nearer to the date change. The bulk of the time will be spend supporting core existing systems including the implementation of VMS.

APPENDIX 10 - REPORT ON POLICY AND TECHNICAL ISSUES

1. Professional Certification of IT Professional.

IT staff in the Pacific Islands should be encouraged to be trained and obtain recognised and accredited certification of skiIls through a test such as MS Professional Certification, to the opposite as certification of attendance to a training course. Refer recommendation 20.

2. Licensing & copyright laws

The group encourages adopting a policy of purchasing and running fully licensed software only and discourages the use of copies despite diminishing resources taking also into consideration national copyright laws. The group outlines that the need to develop awareness that status of non-profit organisation could enable to receive preferential pricing in licensing.

3. User Training

National governance need to seriously address the need to provide standardised level of IT training including recognised skill certifications.Users training should be based on needs rather than on what people want. This could go to the extend of conducting IT training need assessment. As for IT staff, the group encourages that training should be sanctioned by skill certifications rather than attendance certification. Users training should be seen in the context of capacity building at longer terms not only in short term of applied courses for specific skills acquisition only. (example: Attachment of Member Country IT staff to raise capacity)

It was recognised that different users require different approaches. For example, one to one training for selected users could be seen as a good investment. Development of a set of "Best practices for users" is encouraged, and should be available to all staffs in organisations.

It was recognised that awareness of users concerning IT tools availability is often needed. In some instance, information, awareness should precede applied skill training. There is a need for creativity in training methods as weIl as cost-effectiveness

The group encourages educational institution with IT curriculum such as USP, FIT etc to promote and facilitate attachments and/or placements ofIT students in regional and private organisations.

It is also encouraged to include hands-on exercise to complete more theoretical IT curriculum in academic programmes.

[Extra notes: Computers are still not "Information Appliance". Training, education & awareness in IT area are required. Clients are Organisation IT staff, users (organisation staffs) and Member country users. The following should also be addressed Applied: software skiIls, generic IT skills, development of set of best practice and general awareness (especiaIly for Manager/Decision makers)]

4. Acquisition of computer equipment.

All IT equipment need to be purchased or approved by the IT unit, including situations when accepting or receiving equipment through Aid where equipment cannot be supported locally.

5. Open software/new technology

Encourage the use of new technology such as Linux as cost-effective alternative to more expensive commercial products, taking in consideration the need for support and cost of maintenance. Encourage USP to provide training in technology such as Linux.

6. Security:

The need for holistic approach should be considered when dealing with security issues, as well as the need to balance security cost against cost of loss of recreating data & corporate information (rather than hardware) or leakage of confidential information.

The group recommends to investigate in security policy all the following issues: AntiVirus, Firewall, Spam protection, Backup procedures, Tested Disaster Recovery, physical protection of hardware, redundant hardware, offline backup storage, documented security policy for users including access right to information, encryption over internet, digital signature.

Internet email is the main channel by which virus is introduced. Exchange based antivirus is highly recommended to stop virus before they reach users. Refer to the recommendations on SECURITY.

7. Balance between Staff Resources (support) and implementation of New Tools

It could be related to the holistic approach in security and/or implementation of new technology such as Linux. It could also be extended in a broader sense to Balance between IT Plan/Strategy and resources for implementation (what should it be ideally and what is realistic and practical).

8. Funding Constraint

It is strongly recommended for organisations to identify specific budget for IT recurrent costs (maintenance, support & manpower) apart from IT acquisition budget.

9. New internet tools and their use in very limited bandwidth situation

Concern that although useful web-based application such as SIDSnet, Outlook web could be rendered ineffective due to a lack of bandwidth regionally. The problem of low bandwidth can annihilate opportunities created by the internet such as Commerce, telephony, conferencing

10. Remote Access in the region

Ipass although a welcome solution for global internet connectivity around the world has not yet been taken on board by all Pacific Islands, and make therefore roaming remote access in the region difficult. PPTP appears to be a promising option for secure remote connection (more secure than POP, less requiring in bandwidth than WebOutlook for email, and offering better overall connectivity to home site).

11. Internet (management bandwidth)

Bandwidth management Awareness & information for users is important in order to have good practices (downloads, large attachment, compression). Transparent solutions are encouraged whenever available (exchange antivirus, management tools to upgrade antivirus, limit on attachment, MaxCompress) are assisting in tackling the issue. Lack of and sometimes unreasonable cost of bandwidth still remains a barrier to general development.

12. Integration of Voice/Data/Video.

Although it is impractical in the internet, the group recommends to investigate the merging of those technologies (also referred as convergence), especially in planning new cabling infrastructure and telephony equipment (pabx ...).

13. Metadata catalog (WAGIS)

Refer to Metadata catalog (WAGIS) paper "SOPAC Wide Area Geographic Information System (W AGIS)", Strategic White Paper, attached as **Appendix 21**

APPENDIX 11 – SPOCC INVENTORY

	FFA	ForumSec	PIDP	SOPAC	SPC Noumea/Suva	SPREP	TCSP	USP
Number users/IT Staff								
Users	43	70+		60	150/80	55	20	> 1000
Users Networked	43	70+		60	150/80	55	15	> 600
IT Staff	4	2	1	4	4/2	2	1	24
Network OS								
peer-to-peer	-	-		-	-/-	Win95/NT4WK	-	Win95
Server (file & printer)	NT 4.0	NT 4.0SP4	NT 4.0	NT 4.0 SP4	NT 4.0/NT 4.0	NT 4.0 SP4	NT 4.0	NT, Unix, OpenVMS
Internet								
Server (Email/WWW/ftp)	NT 4.0	NT 4.0		NT 4.0 SP4	NT 4.0/NT 4.0	NT 4.0 SP4	-	
Connection	Leased line 28.8	Dialup		Leased Line 1.92	28.8LL/1.92	Leased Line	Dial Up	
Firewall	Borderware	NT 4.0/Proxy		NT 4.0/Proxy 2.0	TIS/TIS	TIS	-	
Email client	Outlook 97	Outlook 97		Outlook 98	Outlook98/Outlook 98	Outlook 97	Eudora/Netscape	PCMail, VaxMail, Pegasus
Email server	Exchange 5.5 SP2	Exchange 5.5SP2		Exchange 5.5 SP2	Ex 5.5 SP2/Ex 5.5 SP2	Exchange 5.5 SP2	-	Unix, VMS, NT
Browser	Netscape 4.03	IE 4.01 SP1		IE 4.01 SP1	IE4.01 SP1/IE 4.01 SP1	Netscape	Netscape/IE	Netscape
Hardware								
Unix server	HP9000/D350/K 220	-		Linux/Sun	2/1	-Linux	-	
Unix workstation	HP9000/705	-			3/-	-	-	
NT file server	5	6		4	13/2	2 (+1 for test)	NT 3.51	> 10

	FFA	ForumSec	PIDP	SOPAC	SPC Noumea/Suva	SPREP	TCSP	USP
NT Workstation	5	-		10	30/2-	-2	-	10
W95 Workstation	30	70		50	90/50	30	1	> 600
W98 Workstation		11						
WfW desktop	-	-		-	1/-	-	1	20
NT laptop	-	-		-	1/-	-2	-	-
W95 laptop	13	9		10	20/7	31	4	30
W98 laptop		4						
WfW laptop	-	-		-	-/-	-	-	-
others (specify)	-	-		-	Macs: 6/8	-	-	-
Software								
Office suite	Office 95/97	Office 97 OSR2		Office 97	Office97/97	Office 97	Office 95	Office 97
Database	Access 97/Oracle 7.3	Access 97		Access97/SQL 7.0	Access/SQL	Access 97	Access 95	Access/Oracle
GIS	-MapInfo	-		MapInfo/Erdas/ Vertical Mapper	Mapinfo/-	MapInfo/Arc View	-	MapInfo
Library	CDS-ISIS	EOS Professional Series		CDS-ISIS	InMagic/Access, Procite	InMagic	-	URICA
Accounting	FinanceOne	SunSystems/ Vision 5.04		-SunSystems / Vision 5.04	SunSystems	AccPac Win	ProBiz	Banner
Backup	ArcServe 5.0	Backup EXEC NT		ArcServe/NT	ArcServe 6.5	Backup Exec	NT	NT, Unix, VMS
Antivirus	Norton, McAfee, Thunderbyte	McAfee		McAfee	Norman Virus Control	McAfee/Scan Mail (trends)	McAfee/Macro w	McAfee

APPENDIX 12 - INET98 REPORT

TRIP REPORT 10-30 JULY - INET'98 AND DEVELOPING COUNTRY WORKSHOPS IN GENEVA (by FFA Participant, Sam Taufao).

PURPOSE:

In late May, Mme Tarja Virtanen, Communications Advisor at UNESCO Office for Pacific States rang me about INET'98. They would like a Pacific Islander to attend both the Developing Country's Workshop and INET'98 in Geneva, and as a result write a paper on the formation of a Pacific Chapter of the Internet Society. UNESCO would cover all reasonable expenses.

RATIONALE FOR ATTENDANCE:

FFA has been instrumental from the beginning on the establishment of Internet in island countries due to its success with transferring data between FFA and member countries. This was particularly true of countries which have leased line connections for Internet services.

In 1995, Alasdair Blake attended on behalf of FFA, with all costs paid for by FFA. In 1996, we applied unsuccessfully to the Internet Society for funding assistance so that Albert Carlot could attend INET held in Montreal. We were also unsuccessful in 1997 to secure financial assistance for Ramesh Chand to attend INET held in Kuala Lumpur. Given that UNESCO was willing to fund our participation at rNET'98, we were grateful for the opportunity to participate.

Briefly, it was recommended to Executive Management that FFA can benefit from the technical knowledge to be gained, establishing good relations with key personnel in the international Internet community, access to technical skilled people via the net, and financial assistance by taking up UNESCO's offer.

Executive management approved the IT Manager's participation at the Developing Country's Workshop from 13-17 July at Cite Universitaire in Geneva, followed by a series of meetings of the Asia Pacific Internet groups on 20-21 July, and finally INET'98 from 22-24 July. All these were held in Geneva. My participation, registration fees and airfares were kindly paid for by the UNESCO Office for Pacific States, whose Head Office is in Apia.

FUNDING SUMMARY:

The registration and attendance fees were USD 3,500 and were paid direct by UNESCO to the Internet Society. Air tickets were done by UNESCO's travel office in Auckland and sent via DHL courier to FFA. In addition, UNESCO paid USD 400.00 for the two weeks in Geneva.

SUMMARY OF MAIN EVENTS DURING TRIP:

DEVELOPING COUNTRY WORKSHOPS

From 13-18 July, I attended Track 1 of the "Network Training Workshops" for developing countries. This track was titled "Host-based Internetworking Technology".

I was originally included in Track 4 - "National Network Management" which dealt with Policy and Management issues regarding the Internet. However, during discussions with resource personnel such as Mike Jenzen from South Africa, and Geoff Huston of Australia, it was apparent that Track 4 dealt mainly with Policy issues, while Track I provided material that FFA needed at the time.

Several important issues affecting FFA, and some member countries were discussed during the workshop. Some of these issues are highlighted in the special report to UNESCO. However, the major ones are:

- For the last two years, Internet addresses began using the "Classless InterDomain Routing" (CIDR) system to replace the old Class A, Band C system of IP addressing. To my knowledge, there is limited knowledge of this if any in all Pacific island countries.
- Each ccTLD (country code Top Level Domain eg .WS for Samoa) is allocated 10/23 IP addresses. In the old Class A, Band C system, all island countries that registered for Internet were given 4 x Class C addresses or approximately 1,000 IP addresses.
- As a result of the new CIDR system, Internet Service Providers (ISPs) and administrators for ccTLDs need to plan properly not only for the present but the future on the range ofIP addresses needed under their individual domains.
- A whole series of new technologies have evolved which can revolutionize some of the requirements in FFA and its island countries. For example, baseband modems with speeds of 768 kbps (approx. USD 800) or speeds of 1 Mbps (approx. USD 1,000) can connect sites at distances of up to 4 miles using ordinary copper wires. In theory, we can connect the FFA Conference Center to the main network at very reliable speeds for a cost of approx. USD 2,500.
- A realization that while the Internet and the information revolution continues to change society and business in developed countries and some developing countries, the Pacific island countries lag way behind. Even regional organizations such as FFA and FORSEC have shown their inability to adjust to environmental and business changes happening around them.

SEMINAR ON DEVELOPING COUNTRIES

On 20-21 July, I was invited to attend the seminars on "Developing Countries and the Internet". This was organized by representatives from developing countries such as Egypt, Ghana and moderated by a lady from Singapore. One of the panel speakers was Mr. John Rose, a senior officer from UNESCO Office in Paris. I had discussions with John Rose about some options we could adopt to fast-track the involvement of Pacific island countries on the main issues that affect the Internet at present.

ASIA PACIFIC INTERNET GROUPS

During the same two days, there were separate discussion meetings of the Asia Pacific Group. There were 4 representatives from the Pacific island countries who attended INET'98: one from PNG, two from Fiji and myself from Solomon Islands. We were all invited to these meetings and it again highlighted how Pacific island countries have been left far behind with current developments, primarily through our own choice and inability to open up, look around and see what is happening. ("Nobody who is satisfied with themselves and their achievements will realize that they are sinking until there is no more air to breathe" - by then itwill be too late).

The Asia Pacific Group already has the following subcommittees or subgroups:

- APNG - Asia Pacific Networking Group
- APNIC - Asia Pacific Network Information Center (office just moved from Tokyo to Brisbane. This is the office responsible for assigning IP addresses to Pacific island countries when they apply for registration to the Internet)
- APIA - Asia and Pacific Internet Association
- APAN - Asia Pacific Advanced Network Consortium
- APPLe - Asia Pacific Policy and Legal Forum
- APRICOT - Asia Pacific Regional Internet Conference on Operating Technologies

- APDlP - Asia Pacific Development Information Programme

The 4 representatives from Pacific island countries were asked to get involved and during the plenary session, I asked the meeting about what sorts of arrangements are envisaged to address the needs of small island countries. Everybody looked at each other and finally Professor Jon Postel, currently responsible for lANA (the overall authority for assigning Internet domains and addresses) responded that it is something for newly constituted regional bodies (such as APNIC and APccTLD) to address. Basically, it means we have to get involved and put our needs forward. Both Australia and New Zealand were represented at this meeting and I don't think these two countries or Asian countries have the time or resources to worry about other's needs - the same goes for Pacific islands and their needs.

MEET THE PRESS LUNCH

On 2 I July, I was invited to the "Meet the Press Lunch" which had a large press corps, Internet personalities such as Vinton Cerf who invented the Internet (more correctly the *TCP/IP* protocol which makes the Internet what it is) and many others. I was asked about the Internet presence in Pacific island countries which fortunately for me, I knew very well as a result of the VMS project. The Internet Vice President for Conferences, Professor George Sadowsky (Professor of Statistical Computing at New York University) surprised me with his knowledge of small Pacific Island countries. One of his question was whether Nauru was connected to the Internet yet or not.

INET'98 CONFERENCE PROPER

From 22-24 July, it was the INET'98 proper conference. Each day started off with a plenary session with a key speaker such as France's Minister for Culture and Information, then 2 or 3 panel speakers, followed by a Q&A session. After that, the rest of the day is divided into a series of parallel sessions on various topics such as E-commerce, Internet and education, Internet 2, Issues affecting developing countries, and very technical issues. All the papers are available in a CD I received as part of attending the conference and it was a useful experience.

There were also several late evening sessions around 9:30 pm and these were mainly to do with the Asia Pacific groupings.

DISCUSSIONS WITH JOHN ROSE AND MIKE JENZEN

During the conference, we sat down with these gentlemen and looked at options to fast-track some strategies for Pacific island countries to start grappling with Internet issues.

As a parallel to the VMS, the technical side needs to be pushed very fast forward. FFA is understandably not the best body in the region to do this.

One of the suggestion was to try and organize a special 6-day training session for Pacific island countries before the end of this year, either in Honiara or Fiji. Mike Jensen who is a freelancer can be available to run these and this course will be customized to cover all the important material of Tracks 1,2,3 and 4 of the "Developing Country's workshops" which I attended. In effect, the one training course will cover topics on:

- Host-based internetworking technology
- Backbone internetworking technology
- Network navigation and services
- National network management

John Rose was positive about such an arrangement with UNESCO covering the costs for the resource personnel, course material and incidentals, provided some funding source can be identified to cover air fares and DSA for Pacific island participants. Given the importance of these issues to developing countries, I thought of the PDF fund for the US Treaty. Even if the participants came from sectors outside Fisheries, the contribution from PDF (if approved) for such an exercise will be a major benefit for Pacific island countries.

The benefits to holding such an exercise as early as October or as late as November 1998 is that it gives island countries immediate technical knowledge and ideas on identifying their infrastructure needs, and taking stock of what is actually available in countries, what else could be improved, and possible future plans.

A fast-tracked technical strategy should naturally lead to greater awareness in island countries about the Internet issues and the sorts of changes and impacts they have on modern society and how we live. From such an awareness, it should create some visible opportunities for legal, policy and management people to start focusing at issues relevant to their country needs.

DISCUSSIONS WITH NZ DELEGATION

During several periods of the week 20-24 July, I met with the NZ delegation. Jim Higgins has been involved with the UNESCO project, Dr John from Victoria University in Wellington was a presenter at INET'98 sessions and Patrick was the Chief Executive Officer of Domainz, the registry body for the .NZ domain.

On Friday 24 July, these 3 gentlemen shouted me to dinner in which we discussed some ideas Jim had in mind.

Jim believed that the immediate hurdle was the lack of technical expertise in the island countries regarding the Internet and its potential to serve the community. I agreed with Jim.

Jim then explained that he had been working on a plan to bring some Pacific Islanders in some operational Pacific Island ISPs for about 6 weeks attachments to NZ ISPs. He had spoken to several NZ ISPs about this and there was positive reception to the idea. The attachment would give Pacific islanders an excellent opportunity to have hands-on experience about operating ISPs. One of the problems not quite sorted out was accommodation. Since there is a large Pacific island community living in NZ, Jim suggested that one option was to ask the Pacific Island community in relevant areas in NZ to billet these trainees.

I have thought carefully about this strategy since leaving Geneva. It is a great idea. I fully support the attachment concept and the proposed 6 weeks duration is sufficient. Given my experience with the fellowship attachment and training project we have had at FFA for the last several years, I am slightly concerned at the accommodation option. The success of the strategy can end up depending heavily on how adequate and satisfactory that aspect is. For example, will it be possible for trainees to arrive on time and spend longer hours if required? The Pacific context of being a guest in somebody else's home almost obliges the guest to give the host priority on timelines. If the host's schedule is inconsistent with the NZ ISP's arrangements and in particular on some issues where the trainee has asked for specific attention, the objectives ofthe strategy may not be fulfilled.

Other than these latter concerns, I feel Jim's strategy can produce excellent results.

I also suggested to Jim that it would be beneficial if some action plan can be put together for Patrick and himself to start running some awareness lectures and presentations to senior government and policy people in Pacific island countries. This need not wait until the local pool of technical expertise is well established, but can be instigated in parallel. In fact, there is more urgency in this latter area of policy and management as a result of current negotiations over the new lANA, special interest groups of the Asia Pacific region and how countries can develop their own procedures. As Patrick runs Domainz, his contribution to

raise awareness in Pacific island countries about running country domain registries, and operating them on a cost-recovery basis for example is a much more urgent requirement.

LIAISON WITH OTHER PACIFIC ISLAND PARTICIPANTS TO INET'98

As I mentioned earlier, there were two other participants from Fiji and one from PNG. We met on several occasions to discuss possible strategies on the formation of a Pacific Internet Society. These were all informal discussions over meals or during breaks between training and meetings.

We all agreed that the workshops we attended were very useful and easily some of the best training exercises we had been involved in. The instructors were very experienced and practical people. The lecture notes, course material, administrative arrangements and supporting reference material provided for us were well organized.

We agreed to communicate frequently over email. We also agreed that Pacific island countries have a long way to go before realizing the full potential and benefits of the Internet revolution. And we fully supported the continuous participation of other staff from our own organizations, and any other Pacific islands who are eligible to attend these activities in the next year in San Jose, California.

SUPPORT REFERENCE AND DOCUMENTATION FROM WORKSHOPS

The level of teaching, hands-on practical exercises and information sharing during the workshops was of very high quality. However, one of the most rewarding experience was the development of personal relations with some of the very qualified technical engineers in the field. These people who volunteered their services came from the US, England, France and many other developed and developing countries. It was a great environment to work in.

In addition, a substantial amount of take-home tonnage resulted from the reference text books and notes provided free from O'Reilly and other publishers who co-sponsored the workshop. These material will greatly assist FFA in its efforts to do its work properly, and support island member countries where it can.

PARTICIPANTS AND RESOURCE PERSONNEL

In all my years of working, I have never been to an event with such a wider international representation, particularly those from developing countries. Over meals, it is not uncommon to find out that our problems with monopolies of some sorts being stumbling blocks to genuine development, or government inaction are the same in Africa, Asia, South America, Eastern Europe as they are here in the Pacific island countries. There are both good and depressing lessons here.

We are not alone with our problems. And there are some promising developments in Africa which can guide us here in the Pacific island countries. For example, the President of the Uganda Chapter of the Internet Society is a member of parliament, Hon. Dr Johnson Nkuuhe. He recalled that some years ago when he was still a lecturer in a University back home, he visited Canada in the days of the old Digital PDPII computers. But he marveled at its value and felt in himself it had a major contribution to his society. An incident he explained which really caught my attention was a survey of Uganda members of parliament the Uganda ISOC ran as they were discussing legislation concerning the Internet. 6% of parliamentarians used a PC at home or work regularly; 18% used it occasionally and 76% had never used it at all. On another question, 6% claimed they could type as fast as their tongues; 59% could type with one finger and 35% had never typed at all. On the question of whether they were willing to invest in a computer, an overwhelming 100% said Yes. Hon. Nkuuhe and his colleagues concluded and I quote "that politicians

were not as bad as originally thought". The moral here is that the champion to make a change and do something is coming from the top and spearheaded by a member of parliament. The sorts of areas in which Hon. Nkuuhe and ISOC Uganda got involved in are:

- Debate ofthe Telecommunications Act and facilitating input from all stakeholders
- Enhancing the knowledge base of politicians particularly with the critical issues
- Liberalization ofthe Telecommunications industry, privatization, etc
- Services to rural communities and the differences these can make to lives of ordinary people
- Identification of the knowledge gap as a result of having access and beneficial use of these technologies

Uganda ISOC is heavily involved at present in 3 projects to take Internet connectivity to schools. One is funded by the World Bank, a second one by Canada and a third one by UNESCO. The World Bank project started with 3 schools and now covers 10 schools with the intention to include 40 schools very soon. The ISOC Uganda Chapter volunteers support to install and provide technical services to these projects.

I personally met Hon. Knuuhe and asked him that perhaps he can visit our islands and raise the awareness of our leaders about these issues. This is probably the sad lesson - we may need such an exercise to get serious about the implications of the Internet and the information revolution to our societies here in the Pacific islands.

RECOMMENDA nONS

These recommendations are aimed more at FFA for the maintenance of its technology activities, and its supporting role to Pacific island countries. In this context:

1. FFA should plan to include in its 1999 budget an allowance for one of its ITC staff to attend INET'99 and particularly the Developing country' workshops. If outside funding can be secured, the participation of another staff member would be highly beneficial.

2. FFA should encourage the participation of more Pacific islanders. In addition to attending high quality training activities, crucial contacts will be made with technical experts and policy people who can contribute to development or improvement of national plans regarding the use of Internet services.

3. FFA should actively pursue the involvement of SPOCC, in particular the Forum Secretariat in Internet issues, in particular the Asia Pacific special interest groups and how the Pacific island countries' needs can be accommodated. FORSEC seems to be the most relevant body to take up these issues, especially at the policy and management level, given FORSEC's ready access to senior government officials.

4. While the involvement of government officials is encouraged on these issues in island countries, the experience of developed countries such as the US and the Netherlands should be heeded. The objective of government involvement is to facilitate the implementation of good governance and support for adequate infrastructure and policies and guidelines to make sure the Internet contributes positively to the economic and social benefit of Pacific island people. The industry itself should be allowed to develop mechanisms to do its job properly. And care should be taken that no one sector, such as telecommunications with its monopoly on that particular infrastructure does not dominate policy and developments and stifle positive innovation.

S. It is crucial to promote an effective public awareness campaign and education strategy about the Internet, what it is and what it does. When people understand these issues, they will come up with the relevant questions and help with finding best-practice solutions. For the Pacific island countries, benchmarks on costs, quality of services, technical expertise and adequacy of telecommunication infrastructure all contribute to an effective Internet strategy. As the Internet can still be seen as a mystery in many Pacific island countries, the relevant benchmarks we need at present may only be available in developed countries such as Australia and New Zealand.

APPENDIX 13 - BYLAWS OF THE PACIFIC ISLANDS CHAPTER OF ISOC

Article I. - Name

This organisation shal1 be called the Pacific Islands Chapter of the Internet Society.

Article II. - Purpose

I. The Pacific Islands Chapter of the Internet Society serves the Society's purposes by serving the interests of the global Internet community through its presence in the Pacific Islands. It focuses on local issues and developments, and as an impartial advisor to governments and the public on matters of significant interest to Pacific Island people.

2. This Chapter wil1 serve the persons who live, work or associated with the island countries and territories that are situated in the central and western Pacific Ocean. These include (but are not limited to), the Cook Islands, Commonwealth of the Northern Marianas, Federated States of Micronesia, French Polynesia, Fiji, Guam, Kiribati, Nauru, Niue, New Caledonia, Palau, Papua New Guinea, Pitcairn, Marshal1 Islands, Samoa, Tokelau, Tonga, Tuvalu, Vanuatu and Wallis and Fatuna.

3. This Chapter is chartered by the Internet Society. These bylaws neither supersede nor abrogate any of the Bylaws ofthe Internet Society that regulate chapter affairs.

Article III. - Membership

I. All members of a chapter shall also be members of the Internet Society. Membership is not necessary, however, for participation in activities ofthe society or its chapter.

2. Al1 individuals and organisations fal1ing within the defined scope of the chapter shal1 be eligible for membership without discrimination.

3. Membership in the Chapter shall be open to all ISOC members in the locality served by the Chapter upon request and payment of any local dues, as determined by the Executive Committee.

4. Student membership shal1 be open to al1 full-time students; student membership dues shal1 be determined by the Executive Council, but shal1 not exceed 75% of regular member dues.

Article IV. - Officers

1. The officers of this Chapter shal1 be: Chair, Vice Chair, Secretary, Treasurer and Co-ordinator of standing committees.

2. The officers shall be elected at the Election Meeting (EM) of the Chapter in March of each calendar year. They shal1 take office immediately after confirmation of appointments and serve for a term not exceeding 12 months.

Article V. - Duties of Officers

I. The Chair is the principal officer and is responsible for leading the Chapter and managing its activities in accordance with the policies and procedures of the Internet Society and these bylaws. The Chair shall preside at al1 meetings of this Chapter and of its Executive Council. On the advice of the Chapter's Executive Council, the Chair shal1 appoint all members of the committees of this chapter and al1 Committee chairmen.

2. The Vice Chair shall preside at meetings in the absence of the Chair.

3. The Secretary shal1 keep the minutes of al1 Chapter and Executive Council meetings. Other duties of the Secretary include:

- Preparation of the Annual Chapter Report for presentation to the Chapter at the Election Meeting.

- Preparation of the Chapter's Activity Report and submission of this report to ISCO Headquarters.

- Notification to ISOC Headquarters of any changes in the elected officers of the Chapter.

- Submission of any proposed amendment to the Vice President of Chapters for approval, in accordance with Article XI of these Bylaws.

4. The Treasurer shall collect dues, pay all bills, and maintain the Chapter's financial records. Duties of the Treasurer shall also include:

- Preparation of the Chapter's Annual Financial Report for presentation to the Chapter at the Election Meeting.

- Completion and submission of the Annual Financial Report to ISOC Headquarters.

Article VI. - Executive Council

The Executive Council shall consist of the present Chapter officers, the immediate Past Chair, should they wish to participate and the chairmen of the Chapter's standing committees.

The term of the members of the Council shall coincide with the terms of the officers. They shall take office on the first day of the fiscal year and serve for one year.

Article VII. - Standing Committees

I. The Standing Committees of the Chapter shall be:

- Membership, program and finance committee;

2. The primary functions of this committee are as follows:

Committee Name	**Function**
(a) Membership, program and finance committee	This committee is responsible for the administration and management of the Chapter's activities. This committee shall plan and make arrangements for the technical programs of the Chapter's meetings in accordance with the membership's interests and the aims of the Chapter as set forth in Article n. Membership - registration and support to Chapter members Program - administer official activities of the Chapter Finance - subscriptions and administer finances of the Chapter

Article VIII. - Temporary Committees

I. With the advice of the Chapter Executive Council, the Chair may appoint such temporary committees as appropriate.

2. A Nominating Committee, consisting of at least three members of this Chapter, at least two of whom shall not be members of the Executive Council, shall be appointed by the Chapter Chair at least two months prior to the Election Meeting.

3. An Audit Committee shall be appointed by the Chapter Chair at the close of the fiscal year to assure the accuracy of the accounting of the Chapter's funds for the year. This Committee should also verify the accuracy of the Financial Report prepared by the Treasurer for the submission to ISOC.

Article IX. - Meetings

I. The Chapter shall hold meetings only in places that are open and accessible to all members of the Society. Meetings shall be held as planned.

2. The Annual General Meeting (AGM) shall be held in conjunction with the Election Meeting for the Chapter's fiscal year. At this meeting, the Secretary and Treasurer shall each present a report. As this is also, by default the Election Meeting, the election of officers shall be held.

3. Notices of the place and time of all meetings shall be distributed to all members at least one week prior to any meeting, by Internet mail or by oral, telegraphic, or other written notice, duly served on or mailed.

Article X. - Disbursements and Dues

I. Disbursements from the Treasury for Chapter expenditures shall be made by the Treasurer with authorisation of the Executive Council and shall be included in the minutes of the meetings.

2. Dues shall be fixed annually by the Executive Council.

Article XI. - Amendment and Voting Procedures

I. All proposed changes to theses Chapter Bylaws shall have been approved by the Vice President of Chapters before being presented to the Chapter membership for a vote.

2. No official business of the Chapter shall be conducted unless a quorum ofthe Chapter is present.

3. A quorum of the Chapter shall be defined as 50 percent of the voting membership of the Chapter or the Executive Council in the form of Chapter Officers, and the Chair (or their representative) of each ofthe Chapter's standing committees.

4. A simple majority of the members present and voting shall be required to carry a motion.

5. Officers will be elected by a plurality of votes cast. If the election is conducted by mail ballot, sufficient ballots must have been returned to have constituted a quorum.

Article XII. - Dissolution of the Chapter

I. Dissolution of this Chapter by consent of the members shall consist of unanimous agreement of all its officers together with a majority vote at a meeting which has been publicised in advance to all members of the Chapter for the purpose of taking this vote.

2. Should this Chapter be dissolved, its assets shall be transferred to the University of the South Pacific, with the concurrence of the Internet Society.

APPENDIX 14 - OVERVIEW OF FFA'S IT ARCHITECTURE

FORUM FISHERIES AGENCY'S SYSTEMS DEVELOPMENT STRATEGY PAPER, VER 1.0
FFA Information Technology Division
December 1998

Executive Summary

The South Pacific Forum Fisheries Agency (FFA) organisation was set up to provide technical and management advice to small island countries on maximising returns from their fisheries resources. The organisation has 14 island members in addition to Australia and New Zealand whose representatives meet on an annual basis to approve the budget and work programme. There are startling statistics which explain the organisation's existence and primary objectives.

The island countries alone have an estimated total exclusive economic zone area of 30 million square kilometres, which is home to the world's largest stocks of highly migratory tuna species. The estimated annual landed catch from these waters is more than a third of world tuna consumption, with an estimated total value exceeding USD 1.5 billion in 1995.

Given the poor infrastructure, limited equity and manpower to get into commercial tuna operations, the island countries' estimated total monetary benefit from this resource was around USD 70 mill ion. This was for license fees charged to commercial fishing vessels from Korea, Japan, Taiwan, China, United States and a small fleet from the South American countries. The level of license fees are currently set at around 4-5% of recorded annual tuna catches - information provided by vessel operators with limited means for independent verification.

FF A is a large part of the strategy to improve on the existing situation. The organisation comprises technical, policy and fisheries management experts who advise and assist island countries on various aspects of addressing their needs, especially in areas beyond the national capabilities. One of the most widely used service is information technology and communications.

A combination of appropriate technology, updated information and management processes has been a major strategy for the organisation in the last 10 years. However, as the volume of information to be processed has increased, and the business needs of the member countries change, management became concerned at the frequency of queries from external parties about the inaccuracy of despatched information. Some business divisions complained about the lack of positive responses from the IT division on the changes they wanted done or new systems to be built. Many staff began to write their own private databases, using either Excel spreadsheets or MS Access packages to store their data, based largely on which application the staff member was more comfortable with. The implication of these private databases was such that Divisional Heads kept their own contacts databases, and official communications to member countries were being addressed to different people.

This paper summarises the core IT strategies of FFA, in particular the concept of software systems design as it applies to FF A. While the choice of hardware and software platforms are crucial, the most important factor would be the ability to use telecommunication and information technology assets in order to improve efficiency, operational competence and productivity of the Agency's staff resources. The paper therefore presents the three main systems development models used at FF A since late 1993, each with a case study of how it has contributed to improving the situation in the organisation. There have been major improvements - some say more by luck rather than by design. Irrespective of the diverse opinions that abound, the FFA has come out of the "confusion" stage. The current most widely used systems development model is the Incremental model, which has successfully seen the completion of more than 80% of the organisation's business processes as originally defined by Petrovic (1993).

1. INTRODUCTION

1.1 CONTEXT AND ASSUMPTIONS OF THE PAPER

FFA is a service organisation and its primary product is analysed or processed information. The Agency provides technical, legal and management advice to member countries regarding the sustainable management and development of the region's tuna fisheries resources. It provides surveillance and monitoring information to enforcement authorities. It provides tuna industry organisations and vessel operators with geographic boundary details, regionally accepted rules of operations and catch statistics. **It** even has plans to collect, analyse and distribute more sophisticated and near-real time information such as independent satellite-generated vessel positions and inferences of possible types of activities based on expert-system generated data.

This paper is a comparative analysis of the most influential system development models used at FFA since the establishment of its Corporate Data Resource (CDR). The instigation of the CDR project dates back to a November 1993 paper by Nesh Petrovic of Australia titled "FFA DATA MANAGEMENT EVALUATION AND RECOMMENDATIONS".

Petrovic (1993) explained that the CDR objective was "to maximise the quality, timeliness and useability of the Corporate Data Resource, where corporate data resource includes both business data (e.g. Vessel, Catch, Marine Product, Agreement, Country, Project, Account, ...) and systems data (e.g. Entity, Attribute, Process, Program, Database, ...)"

The major assumptions in order to put this paper in its right context are as follows:

I. The Information Technology and Communications (ITC) function is crucial to fulfilling the FFA mission and objectives;
2. The urgent recommendations from Petrovic (1993) were now in place, namely the commitment by Executive Management to develop the FFA CDR facility, defined and delivered an FFA Information Model, defined and delivered an FFA Process Model, documented the existing Application Systems Portfolio, presented a Proposed Applications Portfolio, and laid down specifics for an FFA Data Management Framework;
3. The following standards to guide development work were already in place and documented as official FFA papers:
   - Data Naming Standard for Data Management
   - Data Ownership Model
   - FFA Corporate Data Model for Core Business Areas
   - Applications Development Standards and Guidelines for Forum Fisheries Agency
4. FFA Executive Management had endorsed the adoption of advanced technology such as client/server architecture, local area network, graphics user interfaces, Windows operating environment and appropriate configurations for corporate systems.

1.1 TERMS OF REFERENCE

This report was commissioned to:

I. Document systems development at FFA since the creation of the organisation's Corporate Data Resource;
2. Present the main systems development models used until now;
3. Providing an overview of one case study of how FFA adopted each of these main systems development model; and
4. Summarise the Agency's Information Technology Strategies as adopted at present.

1.2 PURPOSE and SCOPE

The purpose of the paper is essentially to provide a road map or reference point for the organisation with regards to future systems development activities, mindful of the good points to keep and the undesirable effects to be controlled if they can't be avoided.

The scope of the paper is limited to the main systems development models that were used predominantly between 1994-1997 for the delivery of CDR applications. There have been more efficient models in use since then, and have made significant contribution to the early completion of the regional Vessel Monitoring System (VMS). However, these systems development activities were by external contractors, who will also be responsible for maintenance support and enhancements when required.

1.3 TARGET AUDIENCE

This report is intended for:

I. Executive Management and Divisional Heads ofFFA who are responsible for policy and decision-making in the organisation;
2. Donor organisations with an interest in the work of FFA; and
3. Information system professionals that will be involved in data modelling, systems development and maintenance support of core FFA applications.

2. SYSTEMS DEVELOPMENT BACKGROUND

In this context, SYSTEMS refers to computer-based systems and we can accept the Webster's Dictionary definition of "a set of arrangement of elements that are organised to accomplish some predefined goal by processing information" (Pressman 1997, p.232).

It has often been asserted that a major advantage for Information Technology practitioners is that they are very systematic. This statement refers to the established procedures which are available to programmers, analysts and systems developers to do their work.

For example, a "Request for Tender" to deliver a Payroll System using client/server technology is almost guaranteed to result in different tenderers proposing local area networking, server platform with a database management system and client PC computers with the business application software. While the Payroll System software application may be written in different programming languages and have various user interface appearances, the methodology will be based on some existing plan with well-defined processes. This plan is also known as a model and is used to describe an abstract concept such as building computer application systems.

The Classic Life Cycle or Waterfall Model would have different phases such as Requirements, Analysis, Code construction, Testing and Integration, before the system is accepted for operation on a production basis. Regardless of which model being used, the system development process will be based on some established procedures and techniques.

As models are aimed at explaining complex concepts, they have limitations as well. For example, some of the Waterfall Model's major weaknesses are an assumption that the user knows what he/she wants the system to be, and it does not explain the iterative requirement to provide checks and feedback on whether the product being built by the developer is what the user is expecting to receive. The user's main chance to influence the end product is at the Requirements Phase which is at a very early stage of system development. If there is a very contractually-based arrangement between the developer and user on what's being built, the results may be incomplete user specification, construction using wrong assumptions or delivery of a useless system.

There are many system development models currently in use throughout the industry. They range from the well established "Linear Sequential or Waterfall Model" to newer techniques such as the Object-Oriented Model". These various models continue to be refined and be used in different applications, types of organisations and for all sorts of purposes. Just as these models continue to be refined, so will the applications for which their purpose is intended. Software systems don't wear out but they can be retired. The needs of all business users have one thing in common - "over time, they change". As business requirements change, the models and tools for development will have to adjust accordingly, and the existing applications will need relevant modifications within schedule and cost constraints if they are not to be retired or replaced with new ones.

This paper will focus on the Linear sequential, Prototyping and Incremental models of systems development, providing a brief description, business case study and evaluation for future uses at FFA.

Appendix A summarises the current Information Strategy Architecture of FFA. This reflects the focus of FFA predominantly on data management and the implications of such a strategy on improving staff productivity and the efficiency of its business processes.

FFA SYSTEMS DEVELOPMENT MODELS

Despite the existence of several systems development models, the FFA has largely adopted the following models in its development work between 1994 and 1997:

- The Linear sequential model;
- The Prototyping model; and
- The Incremental model.

These models have largely influenced the development of core systems, in particular the Corporate Data Resource applications. Some of the key factors in the choices used was the uncertainty of funding for development work, the technical capability of IT staff at FFA and the time frame over which some of these applications were required.

A brief description of each generic model is provided here, with a summary case study of how the FFA has used it and an evaluation of its future potential to improve development work.

3.1 THE LINEAR SEQUENTIAL MODEL

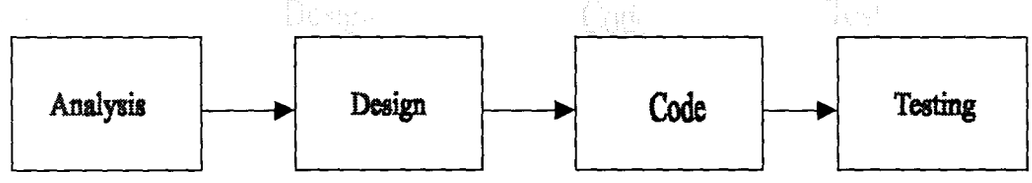
3.1.1 DESCRIPTION

The Linear sequential model is also known as the Classic life cycle or Waterfall model. It assumes a natural and linear progression from earlier stages of system development to the next until the completion of the system.

As with many other system development models, the Linear sequential model has the generic stages of Requirements Analysis, Design, Coding and Testing before the system is ready for delivery to users for operations and production. Deliverables from this model usually take until the end of the development phase to be completed which is a major weakness, and this can be quite devastating for users with limited technical knowledge of their business requirements.

Imagine a waterfall flowing over the ledge from the top and falling down until it splashes on the rocks or whirlpool at the bottom of the river, the most significant thing about this is that the water can only flow down, moving in one direction. In the same manner, the Linear sequential model assumes that earlier stages of development are completed before the next consecutive one.

Figure 1: The Linear sequential model



This is probably still the most popular model for systems development in use.

3.1.2 THE FFA FINANCE ONE APPLICATION CASE STUDY

When Executive Management asked for IT systems improvements in late 1993, it included all information technology projects and applications. At the time, the "Current Application Systems Portfolio" for FFA listed the ACCPAC Plus as the Accounting Package. This was a multi-user package running under the Netware 3.11 platform. It had major flaws such as inadequate interface between the General Ledger and Cashbook modules, monthly posting would delete all posting details from the Cashbook and it was only a partial solution to integral accounting requirements.

The implementation of Finance One was largely driven by the Corporate Services division with technical input from the IT division.

3.1.3 EVALUATION

Despite its inability to handle the iteration process, the Linear sequential model is easier to use and follow. It can be adopted primarily for the following scenarios:

I. To implement the development of sub-systems of existing software applications as was done for the papered case study; and
2. As an initial tool used for planning small-to-medium sized applications internally, where staff are aware of the business requirements and the FFA Information Strategy Architecture.

The main disadvantages of the model from the FFA perspective will be related to development of newer technology systems such as web page design and construction with CGI scripts. New technologies introduce serious risks of technical feasibility for FFA. And the long time frame for completion of deliverables will always be a problem.

3.2 THE PROTOTYPING MODEL

3.2.1 DESCRIPTION

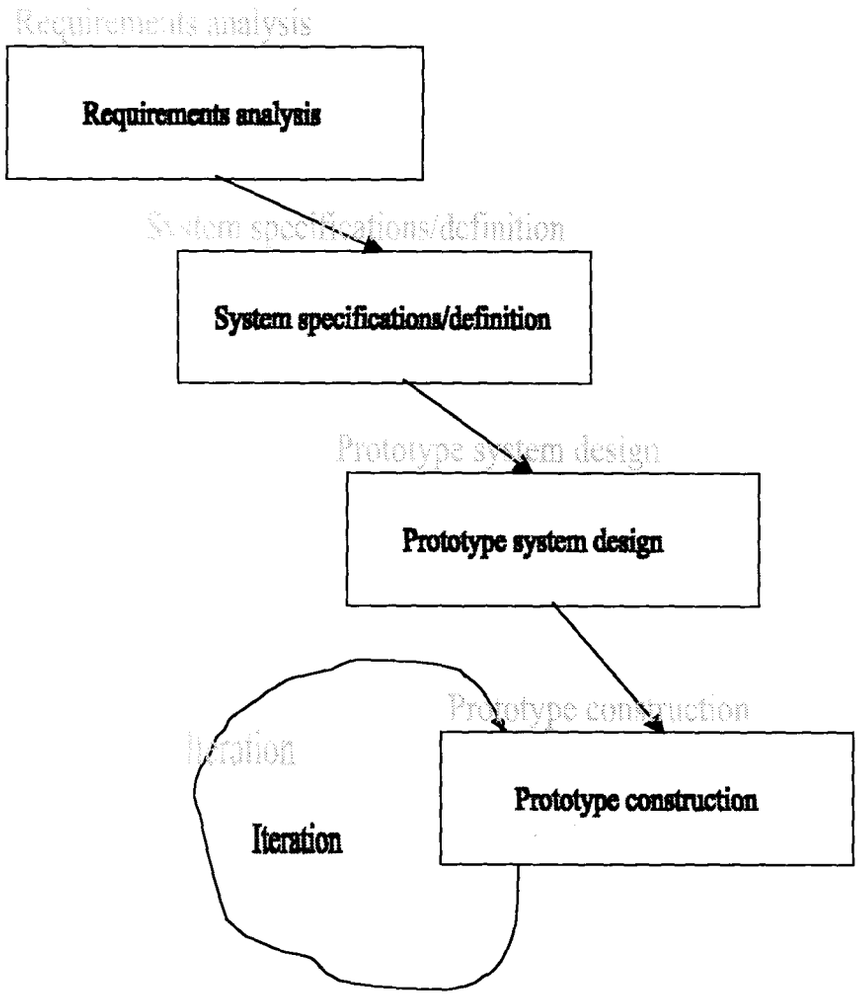
The Prototype model was a major improvement from the Linear sequential model. Its main strengths were the ability to explain the iteration process, and provide a feedback mechanism to enable better understanding of system requirements between the developer and customer, before spending too many resources on the project.

The Prototype model addresses the User Requirement phase properly. This is a big improvement from the Linear sequential model as it enabled the developer with the technical skills to assist the user with accurately defining his or her business requirements.

Another major benefit of this approach is the opportunity for the user to see a sample system based on the defined requirements without committing or signing an agreement with the developer for the delivery of a working system. The ability to see application screen layouts and papers will not only broaden the user's understanding of his or her business requirements, but also provide a feeling for the technical feasibility of proposed deliverables.

There are also serious limitations - often misunderstood and not treated with the proper attention to avoid problems of non-working applications or over-budgeted and behind-schedule projects.

Figure 2: The Prototyping Model



Prototype systems are always built as throw-aways, implying they may be unstable, lightly tested and prone to terminal failures. Prototypes can be developed faster and used to provide more accurate and informed user requirements. However, there is the potential to raise their user expectations too high. This can affect project scope and cause possible drastic implications. Hence, the Prototyping model needs to define rules of system development between the user and developer at the very beginning. The importance of project schedules, cost implications and project planning are critical factors to consider.

3.2.2 THE FFAMAPS APPLICATION CASE STUDY

Spatial data analysis is important to fisheries management which explains FFA's need for a good map display application. Between 1985-1990, FFA had a UNIX-based mapping application written in Fortran 77. It needed a programmer to drive it to draw circle plots and do not much more.

Over time, business users no longer asked to use it and work began in earnest for a replacement. At the time, the Windows 3.0 environment for the IBM PC had just become acceptable for commercial operations. FFA secured a budget to write another home-grown mapping package in C for the Windows 3.0 environment. This project had serious flaws, perhaps due mainly to:

- No project planning with an action plan and an integrated schedule to control the project and match cost against deliverables or milestones;
- The Windows 3.0 environment was fairly new and still an unstable product;
- No technical feasibility study had assessed the viability of the project; and

- The business requirements were all views ofIT staff.

In 1994, FFA adopted the MapInfo package as its mapping tool of choice. FFA secured funding to buy enough licenses for all 14 island countries and headquarters, and to conduct user training courses. At the same time, ERSIS, a Brisbane company was successfully selling its EAZIMAPS product in Australia. It was an ideal opportunity for FFA, as ERSIS was the supplier of all acquired MapInfo and MapBasic development packages.

3.2.3 EVALUATION

The Prototyping model provides an excellent framework for applications where there is a lot more uncertainty, particularly with technical features of the system. The FFAmaps case study is about an application that came right the third time around. Given good project management and the right resources, the expected deliverables were delivered.

FFAmaps is:

1. Small and had very specific business requirements and objectives;
2. The budget was fairly small and the risks quite manageable; and
3. FFA and ERSIS developed very clear procedures on the development of this application, including the transfer of technology and intellectual material, and mutual respect for each other and their organisations.

3.3 THE INCREMENTAL MODEL

3.3.1 DESCRIPTION

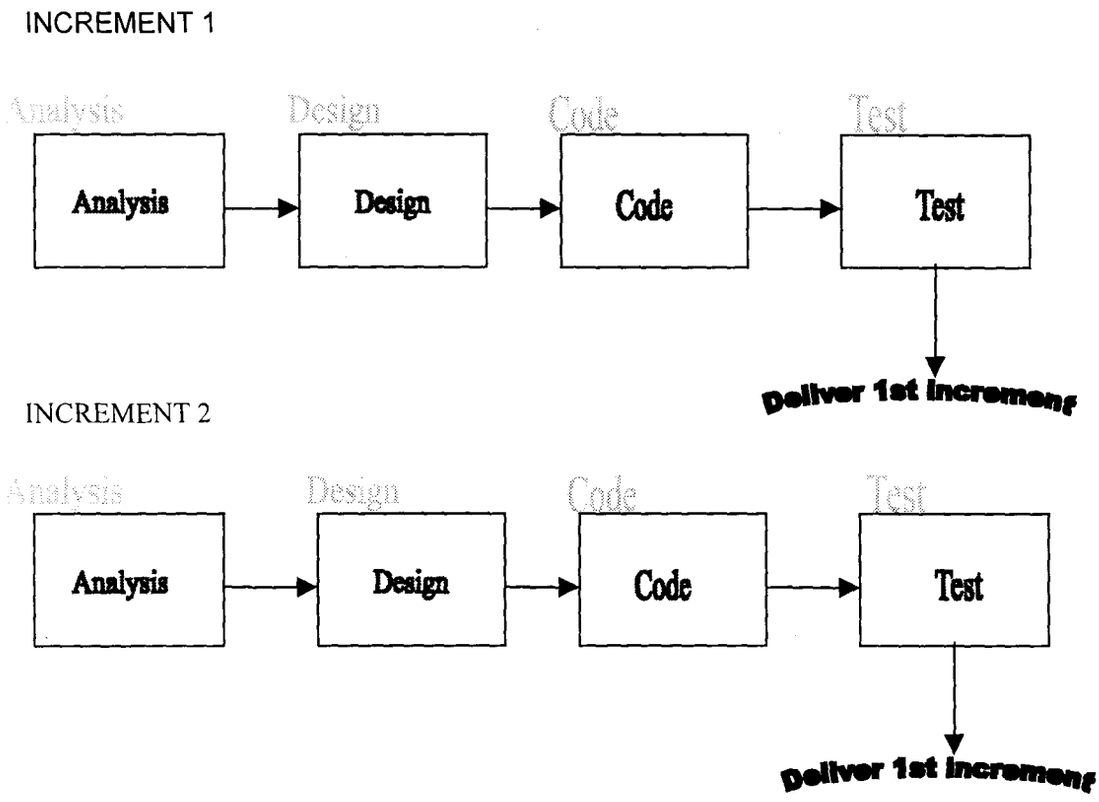
Pressman (1997, p.37) explains that the Incremental model "combines elements of the Linear sequential model with the iterative philosophy of prototyping". The model is an evolutionary approach to software systems development, with multiple deliverables or multiple versions of the same product.

The model can explain the feedback and control iteration structure that is one of the strengths of prototyping. This is very desirable at the business requirements definition and analysis phases. For example, at the increment level of the model between increments 1 and 2 as defined in Figure 3, the second increment deliverable can be an enhanced version of the first increment deliverable.

The model can also explain partial developments which is a particular feature of integrated database systems. For example, the FFA Corporate Data Resource facility started off with the development of one system component, namely the "Vessel Activity and Catch Database System" (VAC) to manage the fishing activities of 50 US purse seiners that were licensed under the Multilateral Treaty between the US and Certain Pacific Island Parties. When the "Regional Register System" (REG) was developed as the next component, the business and data models were modified to ensure good integration between the two system components. Several objects in the VAC System were changed to use corresponding objects in the new REG System.

What this model derives from the Linear sequential model is that each completed increment delivers an operational system component.

Figure 3: The Incremental Model



3.3.2 THE CORPORATE DATA RESOURCE (CDR) CASE STUDY

In early 1994, following the detailed analysis of the "Petrovic 1993 Paper" with recommendations to develop an FFA CDR, Executive Management approved the use of unspent Canadian aid funds to assist with this task. The amount was approximately CND 70,000. Similarly, an amount of SBD 49,000 (equivalent to < USD 15,000) had been allocated to improve the computerised application to manage the US Treaty (which allowed 50 US purse seine vessels to fish in the waters of FFA member countries for an annual fee ofUSD 18 million), There was no other budgeted amount for this purpose.

3.3.3 EVALUATION

The Incremental model improves significantly from the Linear sequential and Prototyping models, and was best suited for large, complicated projects like CDR. It also suited FFA's funding situation. As business users placed higher priorities on different business areas, funding became available to add another application to the integrated CDR database systems. The model's iterative nature helps explain continuous refinement of system specifications at earlier stages of design and control aspects. As for the Linear sequential model, deliverables are expected.

This is the recommended systems development model for most FFA software construction work.

4. OTHER SOFTWARE ENGINEERING ISSUES

While software engineering is critical to the success of systems development, the delivery of successful applications involves other factors as well.

The project management techniques deserves a lot more attention for several reasons such as:

- To establish a good action plan to follow, based on allocated resources, budget and a practical schedule;

- Manage the diverse interests and parties that are part of the project and ensure that all have the commitment and expertise to complete the project; and
- Provide leadership and discipline to motivate employees, raise productivity, and improve quality of the work being done.

An important feature that is closely related to good project management is the ability to measure progress and performance. Any problems identified late in the project will not only cost too much to be corrected, but may drastically affect system performances.

The management and performance measurement aspects of software design raise the importance of having good dialogue options, conflict resolution procedures, and user interface or communication channels between developers and users, between different types of users, and between different members of the software design teams.

One of the more important aspects of software engineering is the human-computer interaction. The graphics user interface (GUI) feature is now a common standard for many modern application systems. There are also available options for users with certain disabilities such as speech recognition products for those with less mobility. Even natural languages other than English are getting more and more mainstream in many new software systems.

To help the developers, there are significant advances with development tools at present. CASE tools, Paperwriters and a lot more options are now available with better efficiency at cutting code, diagramming, generating data dictionaries and creating relevant schemas for systems design. These advances have changed software engineering in many ways by requiring the knowledge and experience with new technologies, and their effect on costs, schedules, performances and maintenance of delivered systems.

One of the fundamental objectives of all these developments is to be able to generate high quality systems that society needs to function. This is a major requirement of modern software engineering.

5. COMPARATIVE ANALYSIS SUMMARY

Features or Uses	**Linear Sequential Model**	**Prototyping Model**	**Incremental Model**
Linear structure	Yes	No	Yes - for each increment stage
Iterative	No	Yes	Yes - between increment stage
Application type	Small	Small	Medium to large projects
Application complexity	Simple	Simple	Complex
Budget/costs	Required	Required	Required for base or foundation and then for each increment stage and integration

This table lists some of the main features of each model and where its use is recommended for software development projects at FFA. These are not exhaustive or 'always true' scenarios, but they provide a simple guide to help with preliminary analysis of which model to use when working on software development work, whether for new applications or enhancements and additions to existing applications.

APPENDIX A: INFORMATION STRATEGY ARCHITECTURE

A.I DATA ARCHITECTURE

FFA's CDR contains both primary data and derived information. CDR is based on good data management principles that support strong business management with the following framework:

- Effective sharing of business information between the various applications or systems;
- Good control over data redundancy and integrity to avoid production of inaccurate papers;
- Centralised data organisation and documentation with handy references for system developers and users;
- Security model to explain data ownership and different levels of access; and
- Efficient Quality assurance checks on incoming and outgoing information.

A.2 APPLICATIONS ARCHITECTURE

The current FFA application systems can be grouped into the following categories:

- Fisheries management information systems comprising the CDR components of (i) Vessel Activity and Catch System, (ii) Regional Register System, (iii) People and Organisations Database System, (iv) Observer Database System, (v) Fisheries Agreements and Licenses System and (vi) Violations and Prosecutions Database System;
- Near-real time Vessel Monitoring System with the capacity to automatically capture and analyse vessel position data from fishing vessels and distribute those as processed information, and including reference details such as vessel registration, licenses and carrying capacity to relevant member country authorities;
- Finance One accounting application to manage FFA financial and accounting needs;
- Mapping tool, namely FFAmaps that runs on the MapInfo application package;
- Microsoft Office suite of office automation applications, including word processing, spreadsheet, electronic mail, integrated facsimile and presentation software systems; and the
- Incomplete Document Management System.

A.3 TECHNOLOGY AND DATA COMMUNICATION PLATFORMS

The FFA information technology environment is based on the client-server architecture with several UNIX and Windows NT servers, and Windows 95 client PC computers or workstations.

The main categories of the FFA technology architecture are:

Hardware and Operating Systems:

- Corporate Database Servers. These are Hewlett Packard servers running UNIX operating systems;
- Corporate PC Network Servers. These are Hewlett Packard Netserver Models running Windows NT operating systems;
- Desktop workstations. These are Hewlett Packard Vectra PCs with Intel 80486 and above processors running Windows 95 operating systems; and
- Portable workstations. These are TOSHIBA PC notebooks with Intel 80486 and above processors running Windows 95 operating systems.

Database Systems and Development Tools:

- Corporate Database Management Systems. All corporate databases use ORACLE RDBMS version 7.3;
- Personal or Workstation Database Management Systems. The two existing choices in use are Personal ORACLE 7.3 and MS Access 97;
- Internet applications such as FrontPage, Internet Explorer and Netcape Communicator web browsers, and MS Exchange 5.0 electronic mail systems; and
- Development tools include Paperwriters and Office automation software packages.

Networking and Data Communications:

- Local area network. The network operating systems are Windows NT 3.51 and 4.0;
- Routers and Ethernet Bridges. All are CISCO and Hewlett Packard devices;
- Cabling and Topology. All cabling is lOBase-T with an ethernet topology structure;
- Hub and Network Interfaces. All are mainly Hewlett Packard devices; and
- Wide area network. Communications in this wide area environment is provided through dedicated Internet connection at a maximum 28.8 kbps bandwidth, International direct dial (IDD) using the public switch telephone network (PSTN) and thirdly the Inmarsat-C satellite network.

APPENDIX 15 - TELECOMMUNICATIONS IN THE SOLOMON ISLANDS

By Mark Flynn, Solomon Telekom

Introduction

Solomon Telekom is the sole telecommunications company with a license to operate in the Solomon Islands. It operates voice and data services nationally, and internationally.

Incomplete brief overview of Telecommunications Infrastructure

Major Regional Centres

Honiara, Guadalcanal Island - Digital Exchange
Gizo, Western Province - Digital Exchange -Satellite Digital Circuit to Honiara
Noro, Western Province - Digital Exchange -Terrestrial Digital Microwave to Gizo
Auki, Malaita Province - Digital Exchange - Terrestrial Digital Microwave to Honiara
Bula, Isabel Province - Digital Exchange -DAMA Satellite Analogue Circuit to Honiara
Kirikira, Makira Province - Digital Exchange - DAMA Satellite Analogue Circuit to Honiara
Lata, Santa Cruz Province- Digital Exchange - DAMA Satellite Analogue Circuit to Honiara

DAMA (Demand Assigned Multiple Access)

Regional Center Local Distribution Technologies

Long Distance Exchange Carriers -Terrestrial Digital Microwave links at *n* x 2Mbps, 64Kbps channels for voice/data
Short distance/local loop - Copper Telephone Wires, Twisted Pair
Rural Customers Local Loop - VHF / UHF Radio Telephone Connections

Mobile Telephone Services - AMPS

Two base stations in Honiara region.
Single Base Station in Gizo, and Auki.

Services

Voice, Data & Paging Services

Voice Services

Traditional analogue switched calls nationally and internationally.

Other value added voice services such as Phone Card operated Public Telephones, Pre Paid Calling Plans, Voice Mail Box Systems, etc.

Current project to look at Internet Telephony / Voice over IP (VoIP) solutions to provide alternative voice services.

Data Services

Point to Point Lease Line Services
X.25 Packet Switched Services
Internet Access

New Services Currently being implemented

Frame Relay Services
Integrated Services Digital Network (ISDN)

Internet

The following is an incomplete brief overview of Internet Infrastructure, with some discussion of Internet issues.

Honiara

I x 128kbps circuit to Optus Spinnaker Internet Services in Australia

Proposal to upgrade to 256Kbps currently being considered Solomon Telekom Management, expect favourable response.

30 x 28.8/33.6Kbps access lines, on 2 x Cisco 2511 Network Access Servers

Proposal to upgrade to Primary Rate ISDN Network Access Server technology currently being considered by management

Gizo

3 x 28.8/33.6Kbps access line, on I x Cisco 2511 Network Access Server

I x 64Kbps circuit to Honiara

Network Services & Servers

Currently upgrading our Internet local area network from lOMbps shared ethernet to 1011OOMbps switched ethernet. Server technology is being upgraded from Intel/PCI Personal Computer type equipment to Intel based servers. Operating Systems used are Linux & MS Windows NT Server 4.0.

Domain Name System Administration and IP Address Assignment

Solomon Telekom has been given the authority to administer domain names under the ISO 3166 Country-Code Top-Level Internet Domain (ccTLD) SB.

Solomon Telekom has been allocated an IP address range by the Asia Pacific Network Information Centre (APNIC) for use in making assignments to customers

Email

Email services are the main reason most people in the Solomon Islands subscribe to the Internet Service

World Wide Web WWW (WWW)

Not all customers have full access to the International Internet, and hence the WWW, some customers choose only to pay for local Internet access. The emergence of quality information, and services, on the WWW means that many customers are beginning to see value in using this interface.

Virtual Private Networks (VPN)

Some business customers are now beginning to implement VPN solutions via the Internet service using Point to Point Tunnelling Protocol (PPTP) or IPSec solutions.

IPass

IPass is a Global Roaming Internet access scheme. Through an alliance with the network providers around the world, iPass enables ISPs to provide easy and secure Internet access with a local call through more than 3,000 access points in 150 countries.

Solomon Telekom does not use the necessary authentication server, or customer billing system, to allow it to participate in iPass

There is currently a proposal before management to upgrade to allow participation but this is a reasonably complex project due to the need to integrate any separate Internet customer billing system with the main corporate customer billing system.

Internet Service Charges

See URL http://www.solomon.com.sb/services.htm for up to date details, a printout of the main pricing page found under this page is attached.

Internet Access Realities

Modem line speeds experienced by customers can be as fast as 33.6Kbps or as slow as 2400bps. The 2400bps connections are typically experienced on customers connected via VHF/UHF radio telephone links, and analogue satellite circuits, connections across these circuits experience frequent drop outs. Customers may be able to improve their connection speeds, and connection reliability, through the use of MNPI 0 error correction and enhanced cellular protocols (called EC or ETC). Solomon Telekom operates modems on all network access servers that support MNPIO or MNPIOEC. Unfortunately most customers have not purchased modems supporting these protocols, preferring instead to purchase inexpensive modems designed without these protocols. The requirement to educate customers about the benefits of investing in a more expensive modem solution has not yet been addressed.

Network Response Times & Utilisation

Network performance indicators like availability, response times, and utilisation are important measures that have to meet certain levels in order to maintain a service that is going to satisfy customers. In Pacific Island countries that are not serviced by fibre optic cable, the starting point for one of those indicators, response times or latency, is already significantly higher than what is normally expected in other countries in the Asia Pacific, Europe and the US. When this higher minimum response time is combined with poor bandwidth, or over utilisation, the final network performance can be unacceptable. Strictly speaking network response time and latency are not the same thing but for the purposes of the following discussion the terms are used interchangeably. INTELSA T refers to this issue as "round trip propagation delay", which is just one aspect of round trip delay.

INTELSA T advises us that a geostationary satellite circuit used for Internet (IP) connectivity has a minimum latency of about 600ms (actually it is more like 530ms but they include some extra for network connections at either end). A standard telephone dialup connection at 28.8Kbps will add about 120ms. So minimum latency for a customer in Honiara dialing into the access lines here and connecting to an Australian based Internet site will be around nOms, provincial customers can add another 600ms to that, giving about 1320ms. A connection to a US site such as the UNDP's www.undp.org from Solomon Telekom LAN in Honiara would appear to be about 932ms, minimum. These times represent best possible response times, if the satellite link becomes congested then those times can quickly jump to 2000ms, 2 seconds, or much greater.

Consider the response times below;

--- www.abc.net.au ping statistics ---
100 packets transmitted, 100 packets received, 0% packet loss
round-trip min/avg/max = 536.0/547.0/753.9 ms

--- www.undp.org ping statistics ---
100 packets transmitted, 100 packets received, 0% packet loss
round-trip min/avg/max = 931.9/1042.7/1971. 1 ms

--- cobaltx.sopac.org.fj ping statistics ---
100 packets transmitted, 65 packets received, 35% packet loss
round-trip min/avg/max = 2830.0/8307.3/12502.7 ms

--- fij02.undp.org.fj ping statistics ---
100 packets transmitted, 42 packets received, 58% packet loss
round-trip *min/avg/max* = *2097.618413.3/21871.5* ms

The round-trip *min/avg/max* times on the first two samples indicate that the Honiara - Optus link is performing well as the minimum time is relatively close to the average time, the maximum is not of much interest unless the average is closer to it. The 0% packet loss is also a good sign as it indicates that the circuit is not experiencing any significant errors. However the next two samples, taken at the same time, highlight some problems that deserve more investigation.

Response times increase as the circuit, either satellite or dialup becomes more utilised, packet loss begins to appear when the circuit becomes over utilised or can indicate a basic fault some where in the network system. Currently in the Solomon Islands our **IP** connection to the Internet experiences a daily average of about 33%, peaks of about 66% utilisation occur reasonably frequently but generally last no longer than 10 minutes, higher peaks occur infrequently.

Organisations planning Internet services targeted at customers in the Pacific Islands need to be very aware of the telecommunications realities of delivery of those services. They need to design and implement their services with those realities taken into consideration. They should also consider the impact of situating services in networks that are also subject to the similar response times, and potential utilisation problems. The combination of the two will not provide very usable solutions, because of this issue it is important that problems connecting to Internet sites in Fiji be improve.

Telecommunication companies can address utilisation problems by assigning more bandwidth to the circuit, however until fibre optic cables are provisioned the minimum response times **/** latency is a fact ofteJecommunications life in the region.

References

http://www.dtool.com/
http://www.aca.gov.au/
http://www.arta.org.au/ntca!

Solomon Telekom's Internet Service Charges

Internet Services

Dial up	Reaistration	Monthlv Charze	**Per minute**
E-Mail only	$150.00	$50.00	$1.50
Full Internet	$300.00	$100.00	$1.50

Web Hosting (10 MB)	**Monthly**
Web Hosting	$62.50

Private Domain Name	Charzes
Private Domain name Registration (1 SI)	$300.00
Private Domain name Registration (2nd)	$600.00
Domain Name Maintenance	$50.00
Web Hosting	*$62.50/month*
1SI 10 Mailboxes	Free

Dedicated Service	**Registration**	**Monthly Charge**
Internet Line	$227.91	$48.00
9600bps	$600.00	$4,000.00
14400bps	$600.00	$5,000.00
28800bps	$600.00	$6,500.00
64000bps	$600.00	$8,500.00

Full Internet Dial-up Access

Package	**Registration**	**Monthly Subscription**	**Monthly Charge**	**Time Allowed**	**Excess Hours**
Casual user package	$300.00	$100.00	N/A	$1.S0/min	N/A
Budget Access Package	$300.00	$100.00	$200.00	20 Hours	$S.OO/Hour
Home User Package	$300.00	$100.00	$650.00	50 Hours	$S.OO/Hour
Internet for Schools	$300.00	$100.00	$500.00	100 Hours	$S.OO/Hour
Non Profit Organisations	$300.00	$100.00	$1,500.00	70 Hours	$10.00/Hour
Corporate Access	$300.00	$100.00	$2,000.00	80 Hours	$12.00IHour

Prices are in Solomon Dollars (approx. Exchange rate Solomon dollar $5.00 = US$1.00). For further details contact the Sales & Marketing department by phone: (677) 21164, Fax: (677) 24185 or visit the Web at *www.cw.com.sb*

APPENDIX 16 - UNESCO REPORT ON ISOC

Building a "Pacific Islands Chapter of the Internet Society"

Samuelu Taufao

Forum Fisheries Agency

9 September, 1998

(report prepared for the UNESCO Office for Pacific Islands States)

EXECUTIVE SUMMARY

As I write this report, I am trying to understand why the Internet can make a difference to our Pacific Islands society? It seems destined for the educated few, the elite and the haves, the chiefs and the smart. Perhaps this is really what it is in the Pacific Islands today.

There is another viewpoint which reached me by Internet email today. This is an extract from Francie Baltazar-Schwartz's "Attitude is Everything"! about a guy named Jerry who explains:

"Each morning I wake up and say to myself, 'Jerry, you have two choices today. You can choose to be in a good mood or you can choose to be in a bad mood.' I choose to be in a good mood. Each time something bad happens, I can choose to be a victim or I can choose to learn from it. I choose to learn from it. Every time someone comes to me complaining, I can choose to accept their complaining or I can point out the positive side of life. I choose the positive side oflife."

This report is about the Internet on the positive side of life. We can choose to give our future generations a better strike rate at the opportunities which are taken for granted by their friends and counterparts in the developed countries of the world. The Internet is a major development in the Information Age. We must build the means to be a part of the Internet, in a very equitable manner for all Pacific Islanders - even at the expense of change, and the costs that define the 'change event' as a revolution.

The Internet in the Pacific Islands would probably succeed or fail as a factor of "the attitude of our senior decision-makers and the commitment to changes that make a positive difference". In this respect, there is a genuine need to provide relevant and accurate information to senior decision-makers about the Internet and its positive contribution to society in developed countries. The experience of New Zealand's Domainz registry and the procedures involved in managing the New Zealand Internet domain infrastructure is an excellent source of documentation and advice. The report raises these sorts of opportunities and approaches.

Many reports point to the lack of technical expertise in Pacific Island countries for areas such as computing, telecommunication and the Internet. These are probably very subjective opinions, given the lack of surveys or studies to really substantiate such claims. It is probably more objective to suggest that there is very little sharing of information and experience among technology experts in Pacific Island countries. A good starting point would be to improve the level of information sharing and technical experience, and to understand what is happening in each country. This can be done either informally, formally or both. The report focuses on the formation of a Pacific Islands Chapter of the Internet Society as one potential approach. On the questions such as membership, objectives and structure, this report makes some initial suggestions - looking for alternative options or refinement.

The ideas in the report come from many sources, including several discussions with individuals who have experiences of failure or success with some activity related to the Net, and are willing to share them for the benefit of others. They also represent opinions from some Pacific Islanders who have gone through the stages of growing up in a village; attended high school in the capital city; moved on to University in a metropolitan country; and returned asking why their colleagues in developed countries do not follow the same patterns in their educational development. The report is like a wish-list which highlights some areas worth reflecting upon in our collective efforts to improve our people's standard of living. It is also an array of opinions to inspire discussions.

TABLE OF CONTENTS

1. INTRODUCTION

1.1 UNESCO INVOLVEMENT

The United Nation Educational, Scientific and Cultural Organisation (UNESCO) has its Office for Pacific States in Apia, Samoa. Its mission statement [Mme Tarja Virtanen to complete]

UNESCO's involvement with Internet developments in the Pacific region took a step forward during the Internet Seminar held in November 1997 in Fiji. This was organised by the Pacific Islands Telecommunications Association (PITA) and the New Zealand National Commission for UNESCO, with funding support from UNESCO.

This report is part of the strategies to address one of the main recommendations from that seminar. It was recommended that "a Pacific Internet Society be established as soon as possible and that the Pacific Islands Telecommunications Association convene an initial meeting to consider the establishment of ISOPAC". The following text was also bracketed next to this particular recommendation and is reproduced here to convey a clearer meaning to the context in which the recommendation was made. *(It was recognised that PITA was a young orgranisation and lacked funds to easily run meetings such as proposed. It was also recognised that as an Internet Society is a users group, PITA may not be the most appropriate group to develop the Internet Society proposal. The potential for creating a revenue stream from the sale of domain names was considered as a possible way offunding the administration of the Internet Society).*

In its efforts to promote the development of a Pacific Internet Society, UNESCO decided to fund the participation of a Pacific Islands representative to the INET98 Conference, and the associated Network Training Workshops for developing countries held in Geneva from 13-24 July 1998. In addition to taking part in the workshops and conferences, it was intended for the Pacific Island representative to network with other participants and Internet Society people, identify sources of potential technical assistance and collect relevant material to assist with the possible 'set-up of a Pacific Islands Internet Society'.

The Information Technology Manager of the South Pacific Forum Fisheries Agency was invited to do this due to FFA's involvement with Internet developments in Solomon Islands, Vanuatu, Kiribati, Federated States of Micronesia, Samoa and Tuvalu.

This report is the result of this agreement.

1.2 TERMS OF REFERENCE

This report was commissioned:

I. As a requirement from the UNESCO Office for Pacific States, which provided funding for attendance at INET'98 and the technical workshops for developing countries in Geneva from 13-24 July; and

2. To advise on the formation of a Pacific Islands Chapter of the Internet Society.

1.3 PURPOSE AND SCOPE

The purpose and scope of this report is:

I. As an adjunct to the Trip Report which covered the main issues during the INET'98 training workshops and conference activities;

2. To provide a draft document for discussions on the formation of a Pacific Islands Chapter of the Internet Society; and

3. In the spirit of seeding an open, controversial and honest exchange of ideas on one alternative for constructive Internet development in the Pacific island countries.

1.4 TARGET AUDIENCE

This report is intended for:

1. UNESCO;

2. Regional organisations, government officials, commercial and public audience of Pacific Island countries who have an interest in sustainable and equitable development; and

3. The unorthodox that believe in the Internet as the infrastructure for innovation which has sparked a new revolution with opportunities for all who dare to be a part of it.

2. BACKGROUND

2.1 PACIFIC ISLAND COUNTRIES

Table 2.1: Land, EEZ and Population Statistics of Pacific Island Countries[2,3]

COUNTRY	Land (sq km)	EEZ (sq km)	Population	Economy
Cook Islands	240 (15 islands)	1.8 million	19,020 (96)	Agriculture, black pearls, offshore banking and tourism
Federated States of Micronesia	700 (607 islands)	2.9 million	110,000 (94)	Agriculture and fisheries
Fiji	18,272 (332 islands)	1.26 million	773,000 (96)	Agriculture, clothing, fisheries, forestry, sugar and tourism
Kiribati	726 (33 islands)	3.6 million	78,000 (95)	Copra, fisheries and seaweed
Nauru	21	320,000	10,700 (96)	Phosphate
Niue	259 (1 island)	390,000	2,100 (97)	Agriculture, banking, telecommunication and tourism
Palau	487 (200 islands)	600,900	17,200 (96)	Fisheries and tourism
Papua New Guinea	462,000	3.1 million	4.2 million (96)	Agriculture, fisheries, forestry and mining
Republic of Marshall Is.	181 (34 islands)	2.131 million	56,000 (96)	Agriculture and US military spending
Samoa	2,934 (10 islands)	120,000	170,000 (96)	Agriculture, fisheries, manufacturing and tourism
Solomon Islands	28,000	1.6 million	380,000 (96)	Agriculture, fisheries and forestry
Tonga	688 (170 islands)	700,000	98,000 (96)	Agriculture
Tuvalu	26 (9 islands)	752,800[4]	9,600 (96)	Agriculture, fisheries and philatelic sales
Vanuatu	12,190 (80 islands)	680,000	177,000 (95)	Agriculture, fisheries and tourism

This report focuses on the fourteen island countries which are members of the South Pacific Forum, twelve of whom are members of UNESCO. This group of countries has available statistics that can put the report into context, in terms of land and sea area, population, political structure and close affiliations. These island countries have had the opportunities of working together on various areas

[2] All Pacific Island Countries listed are also members of UNESCO, except for FSM and Palau

[3] Source: South Pacific Forum Secretariat, Suva, Fiji

[4] Source: Boundary Delimitation Project, Forum Fisheries Agency

of common concern, both in the framework of the regional organisations (Forum, SPC, FFA, ...) and inter-regional organisations (such as UNESCO and other UN agencies).

There is a wide diversity among these island countries, which can be observed in a comparison of almost any specific factor. **In** land size, it ranges from Nauru with 26 sq. km to Papua New Guinea with an area of 462,000 sq. km. **In** terms of exclusive economic zones, it ranges from Samoa with]20,000 sq. km to Kiribati with 3.6 million sq. km. **In** terms of population, it ranges from Niue with approximately 2,] 00 to about 4.2 million in Papua New Guinea.

If these figures look insignificant, then imagine a total population of less than 6.5 million in an ocean area of approximately 30 million sq. km. While the land size may be small, the combined sea area is comparable to the size of Western Europe. Table 2.] summarises the land and sea area, population and economic base for the fourteen island countries covered in this report.

2.2 SPOCC ORGANISATIONS

SPOCC stands for the "South Pacific Organisations Co-ordination Committee", which at present, is permanently chaired by the Forum Secretariat. SPOCC aims to facilitate dialogue and co-operation among regional organisations, and avoid duplication of effort, in particular between organisations with overlapping mandates. Its members include all the major Pacific regional organisations as follows:

Table 2.2: Pacific Regional Organisations>

Organisation Name	**Headquarters**
Pacific Islands Development Programme	Honolulu, Hawaii
Secretariat of the Pacific Community	Noumea, New Caledonia
SOPAC Technical Secretariat	Suva, Fiji
South Pacific Forum Fisheries Agency	Honiara, Solomon Islands
South Pacific Regional Environment Programme	Apia, Samoa
South Pacific Forum Secretariat (FORSEC)	Suva, Fiji
Tourism Council of the South Pacific	Suva, Fiji
University of the South Pacific	Suva, Fiji

5 Source: South Pacific Forum Secretariat, Suva, Fiji

The reference to SPOCC identifies organisations within the region that may be considered as potential base(s) for the proposed "Pacific Islands Chapter of the Internet Society".

There are several factors for consideration. Theses include: funding to support the Chapter's administration and activities; access to the necessary Internet services; as well as the political and economic support for the concept.

2.3 THE REGIONAL MODEL

There are many incidences of regional initiatives involving the Pacific island countries, where a good balance between what can be achieved on a regional scale and those to be addressed nationally has been largely successful. The Forum Fisheries Agency is one good example.

For the 1998-2001 Corporate Plan, FFA has made a choice to focus on the sustainable management of the tuna fish stocks in the central and western Pacific. The scientists believe that the tuna stock moves between the EEZ of the fourteen island countries, adjacent sovereign nations and territories (such as Indonesia, New Caledonia and Guam), and the high seas areas around and between the EEZs. This suggests that no one country can claim to own the fish even when they are in their EEZ area. It also calls for co-operative management arrangements that will hopefully be agreeable to all concerned parties.

The most preferred strategy is achieved by a combination of regional management initiatives and national requirements. For example, the Vessel Monitoring System (VMS) which is aimed at monitoring potential infringements and violations by fishing vessels of the terms of their agreements is addressed as a regional project. Each island member country has a VMS station which enables them to track licensed fishing vessels in their EEZ areas. This maximises the use and effectiveness of the region's scarce resources, standardises on expertise and technology, and provide island countries with the option to extend the system for their specific national needs when the right time and reasons prevail. "Pacific Islands countries need to build up fisheries knowledge if they are to make good money from tuna" (Cartwright 1997, p.1S).

The Internet may be viewed as a technology resource. Like tuna fisheries, it is possible that Pacific islands countries do not have the right skills and expertise yet to develop adequate infrastructure, legislation support and businesses to effectively use the Internet. In fact, not much information has been compiled about the Internet infrastructure, growth and potential in the Pacific island countries.

In its early days, there is probably a preference for a regional model in setting up a Pacific Islands Chapter of the Internet Society as opposed to smaller national Chapters. As each island country creates opportunities and the right mix of essential factors to form a National Chapter of the Internet Society, all must assist to make the transition a success.

An initial regional model will obviously need funding and staffing resources to get it started. In addition, it would need some form of regional endorsement. One of the alternatives is to form an Internet Support Strategy (ISS) objective under the umbrella of a regional organisation such as the Forum Secretariat. This ISS can then be tasked with the responsibilities of creating the Chapter and its foundation policies and procedures, which would use the ISOC-preferred process, and at the same time, develop cohesion among all participating countries.

2.4 THE INTERNET SOCIETY

The Internet has been explained in a multitude of ways such as: "the infrastructure for innovation", or "the network of networks".

For the purposes of this report, we focus on the Internet and its potential impact on our Pacific Island societies, using New Zealand as an example. This would help avoid any confusion concerning definitions. The "Background on the Internet and the Domain Name System (DNS)" section from the web site Domainz: the New Zealand Internet Registry Ltd is an excellent summary of how New Zealand has implemented an infrastructure which caters for their specific business needs. This information can be accessed at the URL http://www.domainz.net.nz.This site has been referenced with permission of Domainz's Chief Executive Officer, who has been a strong supporter of efforts to address the constraints to Internet developments in Pacific island countries.

Appendix A provides a brief background on the Internet, and in particular, the main responsibilities of Domainz and the Internet Society of New Zealand. The relationship between the Internet Assigned Numbers Authority (lANA), Domainz and the Internet Society of New Zealand is an existing working environment that Pacific island countries can review while assessing their own requirements.

Appendix B is the well-known RFC-1591 document, which explains the Internet Domain Name System Structure and Delegation, as it has been operating under Jon Postel. There are numerous forums and electronic mail discussions on a new structure to replace lANA, although the official reference authority is still RFC-1591.

Appendix C is a draft attempt at the Bylaws of a proposed Pacific Islands Chapter of the Internet Society. The draft bylaws have been developed based on the structure and wording provided in the Internet Society Handbook for Prospective Chapters, and is aimed at generating constructive discussions on the business needs of Pacific island countries, that can be addressed through their own chapter of the Internet Society.

3. THE PROPOSAL

3.1 THE ANALOGY

The Internet is like an ET movie type of revolving spaceship hovering over us with strange looking features. We can see its blinking lights and centrifugal spinning motion from down where we are but we don't know what it has to offer - what is it out there? Do we want to know what it can provide? Do we know whether it is peaceful or hostile? If we want answers to these questions, then we need the following:

- A means of communicating with the spaceship;
- The rules of communicating with the spaceship; and
- The benefits and costs of communicating and sustaining a reliable relationship with the spaceship.

We can argue that the spaceship does not in any way appear to be something that would interest or influence our societies, in the manner in which the steam engine became a critical invention to the Industrial Revolution of the early eighteenth century. We know however that the steam engine enabled large ships to be powered by more efficient technologies rather than by men with oars and large sails only, among other useful things it did to society.

We can argue that the spaceship looks far removed from the type of influence which the jet engine had to modern society, which enabled us to fly very long distances and improve the safety of moving from place to place. But we can also learn something new; find out that it has the potential to change our societies in a very positive and constructive manner; and that the benefits far outweigh the negative impacts.

3.2 THE PROSPECTS

It is easier to visualise that the next wave of unchartered travels and explorations will be to outer space. For the Pacific Island countries, there may never be a chance for one of their own to be part of a spaceship mission to outer space. One day, it may happen - just as many of their own can now command large cargo ships using diesel motors and fly airplanes powered by modern jet engines.

Today, we are faced with similar types of challenges in the Internet - another phenomenon of the same significance as the steam and jet engine inventions. We ought to look at the benefits and bad-effects, the technology and the infrastructure, the monopolies and new ventures, the new waves of deregulation and government subsidies or protection, the changes or status quo.

We have choices on some of these issues - but only a few of us have the authority to make them. The following are some of the key issues which need re-appraisal, review and better understanding. For many Pacific Island countries, these are crucial issues for current and future social, economic and technical developments. The decisions may have to look further to include the next 20 years. Whatever decisions are made, these choices will make a huge difference to the opportunities we can expect for the next generations of Pacific Islanders.

3.3 EVIDENCE OF THE CURRENT SITUATION

It is crucial to qualify the contents of this paper. There is probably not a lot of surveys or reports about the Internet and its impact in Pacific Island countries. Such a source of information would greatly assist any strategies put forward to promote positive elements of the Internet to Pacific islands people.

The regional Vessel Monitoring System Technology project being implemented by FFA is probably one of the few such initiatives in Pacific island countries that is heavily dependent on Internet connectivity. The tests conducted so far reveal an overwhelming success rate for traffic over Internet than via International direct dialling (IDD). There are not many alternatives besides these two methods for information exchange.

During project design construction, FFA conducted a survey of Surveillance, Fisheries and Telecommunication staff from its fourteen island members. It is fair to say that the response level was very poor. Table 3.3.1 shows the answers received from each island respondents, and what FFA got from various sources such as actual visits to those countries.

Table 3.3.1: Internet presence in each country as per FFA survey and its own sources

Country Name	**Country Response**	**FFA Sources**
Cook Islands	No	Yes
Federated States of Micronesia	Yes	Yes
Fiji	No	Yes
Kiribati	No	No
Marshall Islands	Yes	Yes
Nauru	Yes	Yes
Niue	No	Yes
Palau	Yes	Yes
Papua New Guinea	Yes	Yes
Samoa	No	Yes
Solomon Islands	Yes	Yes
Tonga	Yes	Yes
Tuvalu	No	No
Vanuatu	Yes	Yes

For the FFA VMS project, fewer than half of the island countries have set up Internet connections to access the hub system at FFA headquarters in Solomon Islands. The number of countries that responded "there is no local ISP" when there was actually one may be an indication of its limited availability to users.

Appendix D also lists findings by UNDP's SIDSnet project about the Internet access rates in the same Pacific Island countries.

3.4 THE TECHNOLOGY

The Internet involves appropriate technology that is essential to support society, business activities, humanitarian objectives and economic development. The core technologies would have to be data communication and computing.

For the purpose of this report, it is perhaps more important to impress the role of technology in today's world of doing things. While many developed countries have successfully integrated technology systems into their business processes and way of life, it is still not clear what the situation is in the South Pacific Forum island countries. This is an issue worth tackling as an immediate concern.

A broad guideline would probably suggest that the following areas be addressed:

- Data communications – refer to section 3.5 on Telecommunication Infrastructure for additional information;
- Internet Service Providers – are there such services available locally?
- Computer hardware and software – what is the availability of these systems and technical support services locally?
- Business applications – what are the objectives for reviewing or wishing to adopt information technology systems? Examples of business applications include electronic mail, web browsing, news services, ftp for file transfers;
- Security choices – there are different security models that have been developed to meet specific customer needs. This is an often-overlooked issue which is preferably covered at the very beginning. Even a paragraph stating a security policy is better than nothing; and
- Network technology – The Internet is based on the TCP/IP protocol. This is the underlying technology which has enable the Internet to traverse geographical boundaries and be successful as it is today. While this is a strictly technical issue, it has to be understood by those in a position to provide and support the Internet services.

3.5 TELECOMMUNICATION INFRASTRUCTURE

The Internet would not help Pacific Islands society without a cost effective telecommunication infrastructure in existence. This is perhaps the most determining factor on whether the Internet does bring beneficial change to our standard of life or not.

In many Pacific island countries, telecommunication is operated on a monopoly license, usually with the assistance of government. We do have constraints due to market or population size, which may be argued favours monopoly arrangements.

It is also arguable that the world has moved on to embrace a customer-based business arrangement. Without government-sponsored monopolies, it is possible for Pacific island countries to experience some level of customer-oriented services. This would be complimented by the globalisation of world trade, deregulation of services such as telecommunication, and the need for ensuring good value for the customer's money.

The main issues that need re-appraisal could be:

- License format - what exactly is governed by the monopoly license and the conditions attached to it? In the final analysis, governments are in a much better position to

analyse the benefits of such arrangements and whether the objectives for which they were made have been met;

- Customer focused services – can this ever be entertained in Pacific island countries? For example, to whom and how does an ordinary customer lodge a complaint for neglect of service?

- Underlying international infrastructure – while developed countries have factored in their future requirements in terms of spare capacity or bandwidth, what is the situation for Pacific island countries? To date, all Pacific Island telecommunication to external parties is carried via satellite. Is there any alternative? Do fibre optics cabling offer future potential? Are the other countries aware that Fiji will have that capacity as part of the Southern Cross cable branch between Sydney and Honolulu? What are the pre-conditions for having that capacity and what are the indicative costs?

- Leased connections – FFA experience has shown that it is not the best alternative to bypass licensed telecommunication operators in Pacific island countries. Telecommunication is a very technical field and it needs highly skilled technicians. The technical work is best left to those organisations, and for a reasonable fee, customers get good service in return for the organisation's right to play its part in society. Leased line connection from telecommunication providers offer the most reliable services in FFA's current experience;

- Local infrastructure – what is the fusion rate for the telephone system and other telecommunication services in each island country? Are the needs of rural communities addressed to the same level as for urban areas?

- Costing – this issue has the potential to extract heated arguments. However, there should be room for governments, telecommunication carriers and the public to have open discussions on the cost structure. It would be good to have benchmarks against which decisions are made. The comparison need not be very compatible to developed countries such as Australia and New Zealand. However, an appreciation of the reasons for the higher cost structure and mark-up percentages would create a transparent and understandable atmosphere.

- New developments – while advances in new technology is phenomenal, some opportunities to allow innovation should be encouraged. Obviously, a competitive market would be more amenable in this respect. Pacific island countries may have to look hard into policies and decisions that can advance such concepts.

3.6 THE PEOPLE

Pacific island people are scattered throughout a large ocean area. The ocean distances remain the same as they have always been, but the isolation because of that need not persist any more. The Internet is a great opportunity to bring Pacific island communities and people closer together. This can be one of the most rewarding objective for the Internet and associated services to Pacific island people.

3.7 THE INTERNET SERVICE PROVIDERS

The Internet created a new business sector in the form of Internet Service Providers (ISPs). The experiences of New Zealand, Australia and the rest of the world can assist Pacific Island countries. The policy and regulations governing the work of ISPs, the security issues, and their relations with customers all need to be properly identified.

In this respect, it is important to distinguish ISPs from Telecommunication carriers. It is more important to define the role and coverage of ISP business from those of Telecommunication carriers, in particular where there are service monopolies in existence.

3.8 POLICY AND MANAGEMENT CONSIDERATION

The Internet, unfortunately, will not exist in a vacuum. As it fuses deeply into our societies, there will be significant impacts. There are advanced discussion in developed countries on these issues, and how much government involvement is warranted.

It is this paper's understanding that Pacific island countries cannot pretend that nothing is happening. There is immediate need for attention on the following:

- Management and administration of ccTLD – ccTLD stands for country code Top Level Domain. This is the domain under which each country is defined in the Internet naming system. For example, .ws is the ccTLD for Samoa;

- Government policy – there is a proper role for government, and how the Internet should fit into the laws of the country. It is also a fact that, where the Internet is operating smoothly, governments take a facilitation role instead of being directly involved in the process; and

- Involvement in regional and world bodies such as APccTLD, wwTLD, etc. – There is a lot of discussion going on at present about the processes to govern the Internet's future. These developments will affect Pacific island countries whether they are involved in current negotiations or not.

3.9 THE PROCESS

The process of forming a Pacific Islands Chapter of the Internet Society must conform to the Bylaws of the international Internet Society. These have been used to draft the Chapter's Bylaws which are attached as Appendix C.

There are some major assumptions made in this paper as follows, to promote discussion:

- In the beginning, there is potential merit in forming one chapter for as many Pacific island countries, taking advantage of organisations such as the Forum Secretariat to house the initiative;

- UNESCO will continue to have an interest in this process, and will assist with securing the services of resource experts, such as Mike Jensen of South Africa (familiar with technical and policy issues in developing countries) to advance the objectives of forming a Pacific Islands Chapter of the Internet Society;

- The Internet Society will provide assistance. The contact at present is Ms. Terry Weigler (email: tweigler@mci.net); and

- Until the Chapter is formally in existence, some co-ordination committee will have to undertake the necessary work to make things happen.

4. RECOMMENDATIONS

This report's primary objective is to generate topics for discussion, and allow a wider level of input to the process of forming a Pacific Islands Chapter of the Internet Society. There will certainly be a host of alternative ideas from others, although there has never been the opportunity to express them.

This report can be seen as one of the initial part of the process. In presenting the ideas within, the main recommendations that may be able to set the framework for the on-going work are:

1. UNESCO Office for Pacific States and their involvement should continue, preferably on a much higher level than before. An immediate requirement is an action plan with technical and management input from Mike Jensen of South Africa, and if possible, Domainz of New Zealand;

2. Debate on whether a regional or inter-regional organisation should be agreed to take the lead initiative. (Perhaps the Forum Secretariat may wish to consider this, given its co-ordination role on matters that are crucial to the future of the region);

3. For initial discussion, it is proposed that the "formation of one Chapter for Pacific Island countries" be used as the seed concept. From that point, each sovereign country is encouraged to look seriously at their own national needs, infrastructure and capacity to support a separate Chapter;

4. The Draft Bylaws attached as Appendix C be used for discussions; and

5. Some form of co-ordination committee is selected to work out an Action Plan for the completion of the work to form a Pacific Islands Chapter of the Internet Society.

5. ACKNOWLEDGEMENT

It is with much gratitude that I acknowledge the assistance from the UNESCO Office for Pacific States, in particular Mme Tarja Virtanen which enabled my attendance at INET-98 and the associated workshops for developing countries. The decision by FFA Executive Management to release me for this trip is another major contributing factor. These decisions and forms of assistance are always needed by Pacific island countries. I would hope that this report is critically pulled apart as one more additional document to advance our understanding of the Internet and its potential impact to our Pacific Island societies.

6. REFERENCES

Cartwright, I. 1997, "The real crunch ahead", in *Fisheries*, volume 1 issue 1, Islands Business International, Fiji.

Internet Society 1998, *Handbook for prospective chapters*, Internet Society, USA.

UNESCO 1997, *Final Report: Pacific Regional Seminar on Internet Introduction & Use 17-19 November 1997,* Suva, Fiji Islands.

APPENDIX A: BACKGROUND ON THE INTERNET AND THE DOMAIN NAME SYSTEM (DNS)[6]

The Internet traces its origins to a US Department of Defence project in the late 1960's, which sought to establish a robust network with no single point of failure.

Almost as a byproduct, it also improved access to expensive and scarce government computer resources on a shared basis. This network of computers quickly evolved into a basis for collaborative research, for sharing information and communicating via e-mail.

Today, the Internet is a vast international network of computers used for storing and sharing information, and used to permit easy communication between its users.

To access information from the network, you need to know its physical address. This is where the domain name system comes in. Essentially, it is a computerised system of names and computer addresses which enables Internet users to locate a web site or send or receive an e-mail. Therefore it is a vital, integral part of the Internet infrastructure.

The domain name system is administered internationally in the USA by the Internet governing body, the **Internet Assigned Numbers Authority** (IANA). IANA delegates responsibility for administering domain name space on a regional basis.

The **University of Waikato** held the original delegation for the New Zealand (**.nz**) name space. In early 1996, they reassessed their role as a provider of Internet infrastructure and decided to relinquish that responsibility.
In April 1996 it was decided that the **.nz** domain name space should be administered by the **Internet Society of New Zealand** Inc. (ISOCNZ). This was agreed in consultation with IANA.
Today ISOCNZ administers the **.nz** space through its subsidiary, The New Zealand Internet Registry Ltd. This company trades under the name of DOMAINZ.

Here's how the key roles and responsibilities are organised in the domain name structure.

A. **Internet Assigned Numbers Authority - IANA**

- is an organisation responsible for overall co-ordination and management of the global Domain Name System (DNS)
- sets policy for the management of that global Internet space. Standards are usually published in RFC (Request For Comment) documents
- **RFC 1591** is a key document relating to the DNS Structure and Delegation
- delegates ISOCNZ specifically to manage the **.nz** country domain space, in line with that policy

[6] Source: New Zealand Domainz web page at http://www.domainz.net.nz

B. **Internet Society of New Zealand - ISOCNZ**

- is responsible for the overall coordination of the **.nz** domain name space in line with IANA policy documents
- the ISOCNZ Council is responsible for the adaptation of those policies and development of local policy for the **.nz** domain space in consultation with stakeholders
- the Council creates second level domain policy to cater for "communities of interest" appropriate to the **.nz** domain space
- has established The New Zealand Internet Registry Ltd (trading as Domainz) to manage the **.nz** domain name space in line with policy
- monitors the performance of Domainz in implementing ISOCNZ's published policies

C. **The New Zealand Internet Registry Ltd - Domainz**

- is responsible to ISOCNZ for the implementation of policies in the day-to-day management of the **.nz** domain name space
- provides fee based registration services for listing third level domain names in the **.nz** domain space
- delegates responsibility to name holders (the 3rd level domain manager) to ensure that each name is managed in line with all ISOCNZ and Domainz published policies
- works with a variety of agents each providing "value added" domain name services in line with published policies

The third level is where you come in. This is where you exercise the right to list a unique domain name, as your Internet identity, in the **.nz** domain space using the Domainz registration database.

APPENDIX B: DOMAIN NAME SYSTEM STRUCTURE AND DELEGATION

Network Working Group J. Postel
Request for Comments: 1591 ISI
Category: Informational March 1994

Status of this Memo

This memo provides information for the Internet community. This memo does not specify an Internet standard of any kind. Distribution of this memo is unlimited.

1. Introduction

This memo provides some information on the structure of the names in the Domain Name System (DNS), specifically the top-level domain names; and on the administration of domains. The Internet Assigned Numbers Authority (IANA) is the overall authority for the IP Addresses, the Domain Names, and many other parameters, used in the Internet. The day-to-day responsibility for the assignment of IP Addresses, Autonomous System Numbers, and most top and second level Domain Names are handled by the Internet Registry (IR) and regional registries.

2. The Top Level Structure of the Domain Names

In the Domain Name System (DNS) naming of computers there is a hierarchy of names. The root of system is unnamed. There are a set of what are called "top-level domain names" (TLDs). These are the generic TLDs (EDU, COM, NET, ORG, GOV, MIL, and INT), and the two letter country codes from ISO-3166. It is extremely unlikely that any other TLDs will be created.

Under each TLD may be created a hierarchy of names. Generally, under the generic TLDs the structure is very flat. That is, many organizations are registered directly under the TLD, and any further structure is up to the individual organizations.

In the country TLDs, there is a wide variation in the structure, in some countries the structure is very flat, in others there is substantial structural organization. In some country domains the second levels are generic categories (such as, AC, CO, GO, and RE), in others they are based on political geography, and in still others, organization names are listed directly under the country code. The organization for the US country domain is described in RFC 1480 [1].

Each of the generic TLDs was created for a general category of organizations. The country code domains (for example, FR, NL, KR, US) are each organized by an administrator for that country. These administrators may further delegate the management of portions of the naming tree. These administrators are performing a public service on behalf of the Internet community. Descriptions of the generic domains and the US country domain follow.

Of these generic domains, five are international in nature, and two are restricted to use by entities in the United States.

World Wide Generic Domains:

COM - This domain is intended for commercial entities, that is companies. This domain has grown very large and there is concern about the administrative load and system performance if the current growth pattern is continued. Consideration is being taken to subdivide the COM domain and only allow future commercial registrations in the subdomains.

EDU - This domain was originally intended for all educational institutions. Many Universities, colleges, schools, educational service organizations, and educational consortia have registered here. More recently a decision has been taken to limit further registrations to 4 year colleges and universities. Schools and 2-year colleges will be registered in the country domains (see US Domain, especially K12 and CC, below).

NET - This domain is intended to hold only the computers of network providers, that is the NIC and NOC computers, the administrative computers, and the network node computers. The customers of the network provider would have domain names of their own (not in the NET TLD).

ORG - This domain is intended as the miscellaneous TLD for organizations that didn't fit anywhere else. Some non-government organizations may fit here.

INT - This domain is for organizations established by international treaties, or international databases.

United States Only Generic Domains:

GOV - This domain was originally intended for any kind of government office or agency. More recently a decision was taken to register only agencies of the US Federal government in this domain. State and local agencies are registered in the country

domains (see US Domain, below).

MIL - This domain is used by the US military.

Example country code Domain:

US - As an example of a country domain, the US domain provides for the registration of all kinds of entities in the United States on the basis of political geography, that is, a hierarchy of <entity-name>.<locality>.<state-code>.US. For example, "IBM.Armonk.NY.US". In addition, branches of the US domain are provided within each state for schools (K12), community colleges (CC), technical schools (TEC), state government agencies (STATE), councils of governments (COG),libraries (LIB), museums (MUS), and several other generic types of entities (see RFC 1480 for details [1]).

To find a contact for a TLD use the "whois" program to access the database on the host rs.internic.net. Append "-dom" to the name of TLD you are interested in. For example:

```
whois -h rs.internic.net us-dom
```

or

```
whois -h rs.internic.net edu-dom
```

3. The Administration of Delegated Domains

The Internet Assigned Numbers Authority (IANA) is responsible for the overall coordination and management of the Domain Name System (DNS), and especially the delegation of portions of the name space called top-level domains. Most of these top-level domains are two-letter country codes taken from the ISO standard 3166.

A central Internet Registry (IR) has been selected and designated to handled the bulk of the day-to-day administration of the Domain Name System. Applications for new top-level domains (for example, country code domains) are handled by the IR with consultation with the IANA. The central IR is INTERNIC.NET. Second level domains in COM, EDU, ORG, NET, and GOV are registered by the Internet Registry at the InterNIC. The second level domains in the MIL are registered by the DDN registry at NIC.DDN.MIL. Second level names in INT are registered by the PVM at ISI.EDU.

While all requests for new top-level domains must be sent to the Internic (at hostmaster@internic.net), the regional registries are often enlisted to assist in the administration of the DNS, especially in solving problems with a country administration. Currently, the RIPE NCC is the regional registry for Europe and the APNIC is the

regional registry for the Asia-Pacific region, while the INTERNIC administers the North America region, and all the as yet undelegated regions.

The contact mailboxes for these regional registries are:

INTERNIC	hostmaster@internic.net
APNIC	hostmaster@apnic.net
RIPE NCC	ncc@ripe.net

The policy concerns involved when a new top-level domain is established are described in the following. Also mentioned are concerns raised when it is necessary to change the delegation of an established domain from one party to another.

A new top-level domain is usually created and its management delegated to a "designated manager" all at once.

Most of these same concerns are relevant when a sub-domain is delegated and in general the principles described here apply recursively to all delegations of the Internet DNS name space.

The major concern in selecting a designated manager for a domain is that it be able to carry out the necessary responsibilities, and have the ability to do a equitable, just, honest, and competent job.

1) The key requirement is that for each domain there be a designated manager for supervising that domain's name space. In the case of top-level domains that are country codes this means that there is a manager that supervises the domain names and operates the domain name system in that country.

   The manager must, of course, be on the Internet. There must be Internet Protocol (IP) connectivity to the nameservers and email connectivity to the management and staff of the manager.

   There must be an administrative contact and a technical contact for each domain. For top-level domains that are country codes at least the administrative contact must reside in the country involved.

2) These designated authorities are trustees for the delegated domain, and have a duty to serve the community.

   The designated manager is the trustee of the top-level domain for both the nation, in the case of a country code, and the global Internet community.

Concerns about "rights" and "ownership" of domains are inappropriate. It is appropriate to be concerned about "responsibilities" and "service" to the community.

3) The designated manager must be equitable to all groups in the domain that request domain names.

This means that the same rules are applied to all requests, all requests must be processed in a non-discriminatory fashion, and academic and commercial (and other) users are treated on an equal basis. No bias shall be shown regarding requests that may come from customers of some other business related to the manager -- e.g., no preferential service for customers of a particular data network provider. There can be no requirement that a particular mail system (or other application), protocol, or product be used.

There are no requirements on subdomains of top-level domains beyond the requirements on higher-level domains themselves. That is, the requirements in this memo are applied recursively. In particular, all subdomains shall be allowed to operate their own domain name servers, providing in them whatever information the subdomain manager sees fit (as long as it is true and correct).

4) Significantly interested parties in the domain should agree that the designated manager is the appropriate party.

The IANA tries to have any contending parties reach agreement among themselves, and generally takes no action to change things unless all the contending parties agree; only in cases where the designated manager has substantially mis-behaved would the IANA step in.

However, it is also appropriate for interested parties to have some voice in selecting the designated manager.

There are two cases where the IANA and the central IR may establish a new top-level domain and delegate only a portion of it: (1) there are contending parties that cannot agree, or (2) the applying party may not be able to represent or serve the whole country. The later case sometimes arises when a party outside a country is trying to be helpful in getting networking started in a country -- this is sometimes called a "proxy" DNS service.

The Internet DNS Names Review Board (IDNB), a committee established by the IANA, will act as a review panel for cases in which the parties can not reach agreement among themselves. The IDNB's decisions will be binding.

5) The designated manager must do a satisfactory job of operating the DNS service for the domain.

That is, the actual management of the assigning of domain names, delegating subdomains and operating nameservers must be done with technical competence. This includes keeping the central IR (in the case of top-level domains) or other higher-level domain manager advised of the status of the domain, responding to requests in a timely manner, and operating the database with accuracy, robustness, and resilience.

There must be a primary and a secondary nameserver that have IP connectivity to the Internet and can be easily checked for operational status and database accuracy by the IR and the IANA.

In cases when there are persistent problems with the proper operation of a domain, the delegation may be revoked, and possibly delegated to another designated manager.

6) For any transfer of the designated manager trusteeship from one organization to another, the higher-level domain manager (the IANA in the case of top-level domains) must receive communications from both the old organization and the new organization that assure the IANA that the transfer in mutually agreed, and that the new organization understands its responsibilities.

It is also very helpful for the IANA to receive communications from other parties that may be concerned or affected by the transfer.

4. Rights to Names

1) Names and Trademarks

In case of a dispute between domain name registrants as to the rights to a particular name, the registration authority shall have no role or responsibility other than to provide the contact information to both parties.

The registration of a domain name does not have any Trademark status. It is up to the requestor to be sure he is not violating anyone else's Trademark.

2) Country Codes

The IANA is not in the business of deciding what is and what is not a country.

of the Chapter's Executive Council, the Chair shall appoint all members of the committees of this chapter and all Committee chairmen.

2. The Vice Chair shall preside at meetings in the absence of the Chair.

3. The Secretary shall keep the minutes of all Chapter and Executive Council meetings. Other duties of the Secretary include:

Preparation of the Annual Chapter Report for presentation to the Chapter at the Election Meeting.

Preparation of the Chapter's Activity Report and submission of this report to ISCO Headquarters.

Notification to ISOC Headquarters of any changes in the elected officers of the Chapter.

Submission of any proposed amendment to the Vice President of Chapters for approval, in accordance with Article XI of these Bylaws.

4. The Treasurer shall collect dues, pay all bills, and maintain the Chapter's financial records. Duties of the Treasurer shall also include:

Preparation of the Chapter's Annual Financial Report for presentation to the Chapter at the Election Meeting.

Completion and submission of the Annual Financial Report to ISOC Headquarters.

ARTICLE VI. – EXECUTIVE COUNCIL

The Executive Council shall consist of the present Chapter officers, the immediate Past Chair, one representative from each participating Pacific Island country, and the chairmen of the Chapter's standing committees.

The term of the members of the Council shall coincide with the terms of the officers. They shall take office on the first day of the fiscal year and serve for one year.

ARTICLE VII. – STANDING COMMITTEES

1. The Standing Committees of the Chapter shall be:

Membership, program and finance committee;

Legislation and government policy committee;

Telecommunication committee;

Information technology committee; and

Internet service providers committee.

(Alternatively, two Standing Committees: (i) Internet policies and management committee and (ii) Technology, industry and education committee will suffice during the start-up phases. These broadly cover all the areas and any sector that can develop itself into an active and autonomous capacity to operate as a separate committee should be encouraged to do so).

3. The primary functions of each committee are as follows:

Committee Name	Function
(a) Membership, program and finance committee	This committee is responsible for the administration and management of the Chapter's activities. This committee shall plan and make arrangements for the technical programs of the Chapter's meetings in accordance with the membership's interests and the aims of the Chapter as set forth in Article II. Membership – registration and support to Chapter members Program – administer official activities of the Chapter Finance – subscriptions and administer finances of the Chapter
(b) Legislation and government policy committee	In all island countries, government is the biggest employer and controller of issues such as Internet. There is legitimate reason to have government involvement in the process. At the same time, government policy is recommended to be focused on facilitating the adoption of benefits from the Internet for Pacific island communities, both in the islands, and overseas. As small population centres and markets, there is merit in adopting standard and uniform policies across all island countries with special attention to additional national requirements.
(c) Telecommunication committee	The Internet in the Pacific islands will have to operate within the constraints and rules of the existing telecommunication infrastructure. In most island countries, there is a monopoly carrier. As governments revise their policies against the current climate of service deregulation, globalisation and advanced technology, the telecommunication industry in the Pacific islands will have to adjust accordingly. The significance of this sector requires the establishment of this committee to examine and review the impact of changes to the telecommunication infrastructure in the region and services provided. This is largely a forum for telecommunication operators and their interests, and to discuss issues raised by Pacific islanders about that particular sector.
(d) Information technology committee	The Internet is part of the information technology revolution and this sector should be encouraged as a forum for constructive dialogue on issues that are important for Pacific islands. The information technology sector is wide and encompassing. The island countries need good advice and this committee can be the catalyst for positive developments.
(e) Internet service providers	The Internet has created a new industry in the form of ISPs. The Pacific islands must encourage fair and conducive procedures for this new sector to evolve as has been done in developed countries like Australia and New Zealand.

ARTICLE VIII. – TEMPORARY COMMITTEES

1. With the advice of the Chapter Executive Council, the Chair may appoint such temporary committees as appropriate.

2. A Nominating Committee, consisting of at least three members of this Chapter, at least two of whom shall not be members of the Executive Council, shall be appointed by the Chapter Chair at least two months prior to the Election Meeting.

3. An Audit Committee shall be appointed by the Chapter Chair at the close of the fiscal year to assure the accuracy of the accounting of the Chapter's funds for the year. This Committee should also verify the accuracy of the Financial Report prepared by the Treasurer for the submission to ISOC.

4. A User and Support Committee, consisting of at least three members of this Chapter, at least two of whom shall not be members of the Executive Council, shall be appointed by the Chapter Chair at least two months prior to the Election Meeting. This Committee will accept and summarise for submission to the Executive Council all complaints and presentations received from any Chapter member which is not deemed to have had satisfactory resolution.

ARTICLE IX. – MEETINGS

1. The Chapter shall hold meetings only in places that are open and accessible to all members of the Society. Meetings shall be held as planned.

2. The Annual General Meeting (AGM) shall be held in conjunction with the Election Meeting for the Chapter's fiscal year. At this meeting, the Secretary and Treasurer shall each present a report. As this is also, by default the Election Meeting, the election of officers shall be held.

3. Notices of the place and time of all meetings shall be distributed to all members at least one week prior to any meeting, by Internet mail or by oral, telegraphic, or other written notice, duly served on or mailed.

ARTICLE X. – DISBURSEMENTS AND DUES

1. Disbursements from the Treasury for Chapter expenditures shall be made by the Treasurer with authorisation of the Executive Council and shall be included in the minutes of the meetings.

2. Dues shall be fixed annually by the Executive Council.

ARTICLE XI. – AMENDMENT AND VOTING PROCEDURES

1. All proposed changes to theses Chapter Bylaws shall have been approved by the Vice President of Chapters before being presented to the Chapter membership for a vote.

2. No official business of the Chapter shall be conducted unless a quorum of the Chapter is present.

3. A quorum of the Chapter shall be defined as 50 percent of the voting membership of the Chapter or the Executive Council in the form of Chapter Officers, one representative from each participating Pacific Island country, and the Chair (or their representative) of each of the Chapter's standing committees.

4. A simple majority of the members present and voting shall be required to carry a motion.

5. Officers will be elected by a plurality of votes cast. If the election is conducted by mail ballot, sufficient ballots must have been returned to have constituted a quorum.

ARTICLE XII. – DISSOLUTION OF THE CHAPTER

1. Dissolution of this Chapter by consent of the members shall consist of unanimous agreement of all its officers together with a majority vote at a meeting which has been publicised in advance to all members of the Chapter for the purpose of taking this vote.

2. Should this Chapter be dissolved, its assets shall be transferred to the University of the South Pacific, with the concurrence of the Internet Society.

APPENDIX D: COMPARATIVE INTERNET ACCESS RATES FOR SIDSNET COUNTRIES[7]

Many SIDS stakeholders are hindered by expensive access charges applied by Internet Service providers or local Telecom monopolies.
This is a major issue with our stakeholders and SIDSnet provides comparisons below of Internet access rates offered in different island nations.
The list is incomplete and rates always change. Please assist us by emailing Daniela (on daniela@sidsnet.org) with corrections or new submissions.

Country	ISP-URL	Status/ Currency rate in July 1998	Internet	64k line	Domain registration
American Samoa	**Samoatelco** www.samoatelco.com	Government owned, monopoly / US Dollars	Initial fee: US$15 US$1/h to US$0.50/h	N/A	Initial fee $90
Cook Islands	**Gateway Polynesia** (http://www.ck/emailbiz.htm) and **Oyster Service** (http://www.ck/emailoys.htm)	Gateway is private Oyster is Telecom Cook Islands / US Dollar / 1 US Dollar is 2 New Zealand Dollar	Gateway: Connection fee $20 + $20 under 800kb traffic - $3/100kb over 800kb Oyster: Registration NZ$25, $20 per month, $15/h	N/A Oyster: $9K	Oyster: NZ$ 35
Micronesia	N/A				
Fiji	**Telecom Fiji** www.is.com.fj	Governmental, but assisted by Cable & Wireless / 1 Fiji Dollar is US $ 0.5	**Individual Installation: FJ$110, Month: $22 $9,90/h Business Installation: $440 Month: $770**	9.6 kbps line Initial fee $440 Monthly $330 to $1100	Initial fee $110, yearly fee $55
Guam	**InternetPCI** www.netpci.com	Seems to be private / US Dollars	Different offers All you can eat PPP Access is $39.95 per	N/A	N/A

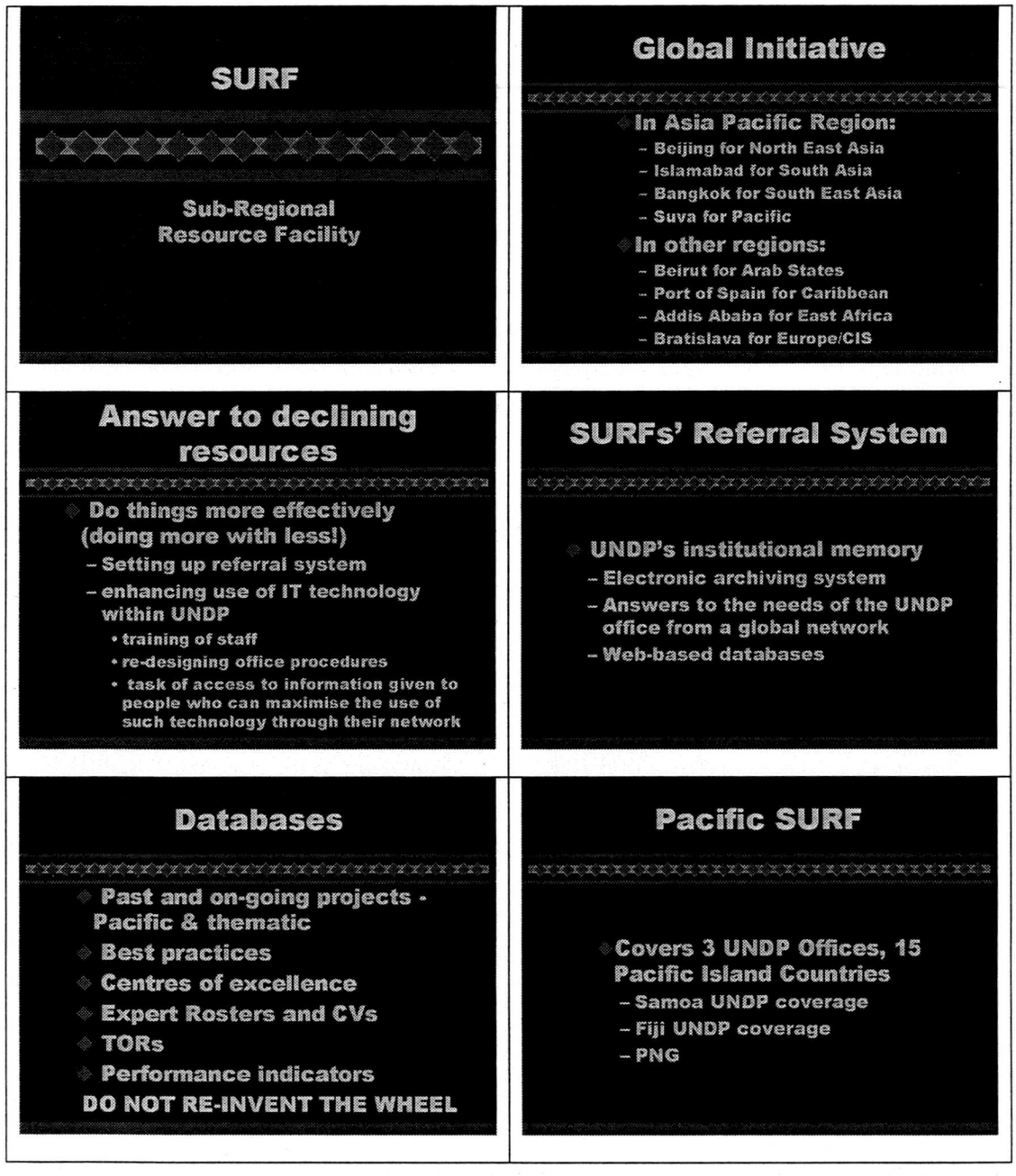
[7] Source: UNDP SIDSnet web site. URL: http://www.sidsnet.org

			month plus $10.00 for email account, unrestricted internet access		
Kiribati	No internet connection	No internet connection	No internet connection	No internet connection	No internet connection
Marshall Islands	Could not find anything				
Nauru	No internet connection	No internet connection	No internet connection	No internet connection	No internet connection
Niue	**.nudomain** http://www.nunames.nu/nav_bar4.htm		No	No	$25 or two names including webpage hosting and email $49.95
Palau	N/A				
Papua New Guinea	www.tiare.net.pg www.datec.com.pg	N/A	N/A	N/A	N/A
Samoa	Samoa.net www.samoa.net	Partnercompany of CSL (Computer Services Limited) / US Dollars	Peak hour user (24 hrs access) Setup fee $330 + 20 hrs free, email account, further hours $11- Off peak user (6pm to 7am) Setup fee $110 + 20 hrs free, email, further hours $11 – Special rates for business on inquiry	No lines available	Is being figured out right now
Solomon Islands	**Solomon Telekom** http://www.solomon.com.sb/	Joint Venture between government (58.1%) and Cable & Wireless (41.9%) / 1 US Dollar is 5 SI$	SI$1.50 per minute	SI$600 for registration, monthly SI$8,500	Registration $300 and $300 per year
Tonga	**Kalianet** http://www.candw.to/members/rates.htm	Cable & Wireless / 1 US Dollar is 1.5 Tongan Pa'anga	$30 for membership application , monthly rate $30 and $15 per hour	Between $750 for educational institutions, $ 1.200 for NGOs and Government, $1.500 for private and business	$100

Tuvalu	No internet connection	No internet connection	No internet connection	No internet connection	No internet connection
Vanuatu	**Telecom Vanuatu** http://www.tvl.net.vu/	Private company, equally owned by Government, Cable & Wireless and France Cables et Radio / 1 USD=132 vt	Registration 8,000 vt, monthly 2,000 vt, and	No lines available	Initial charge 20,000 vt, monthly fee 1,500 vt/month and traffic charge 20 vt/mn

APPENDIX 17 – UNDP'S SURF INITIATIVE

SURF INITIATIVE AND ITS POTENTIAL BENEFIT



The Suva SURF team

- SURF Coordinator - Garry Wiseman
- Webmaster - Mark Borg
- Programme Assistant - ?
- Admin Assistant - ?

SURFs' Thematic Focus

- Suva - Employment & sustainable livelihood
- Beijing - Advancement of women
- Islamabad - Good governance
- Bangkok - Poverty eradication

SURF Networks

- Global Hub
- Sub-Regional Resource Facilities
- Development Partners

SURF should

- Give regional / national experts and institutions exposure on a global scale
- Allow fast access to global expertise / resources

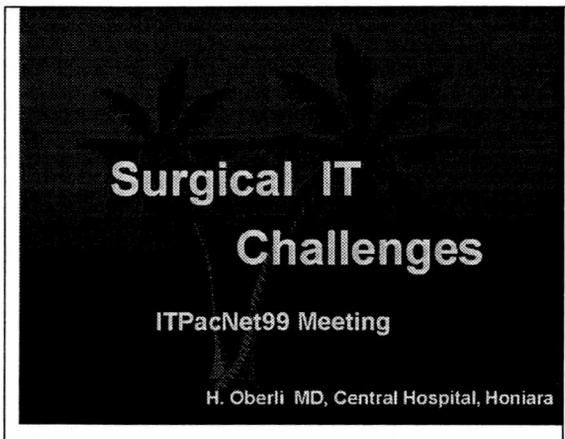
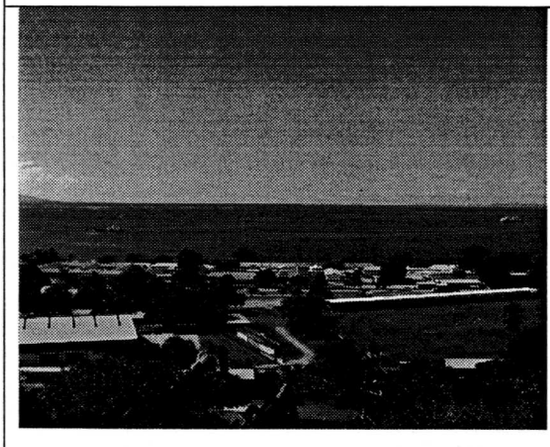
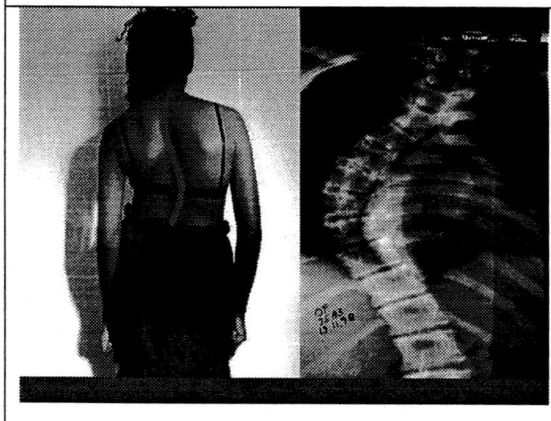
Bandwidth Requirements

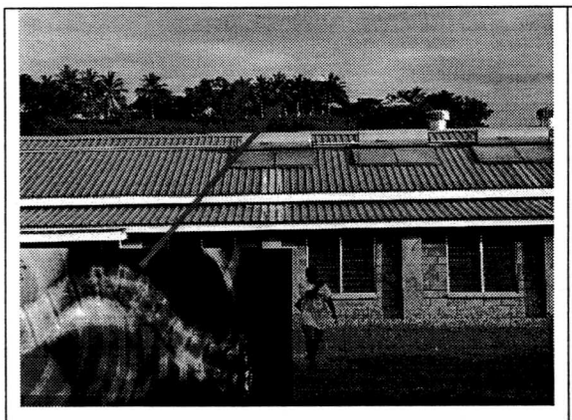
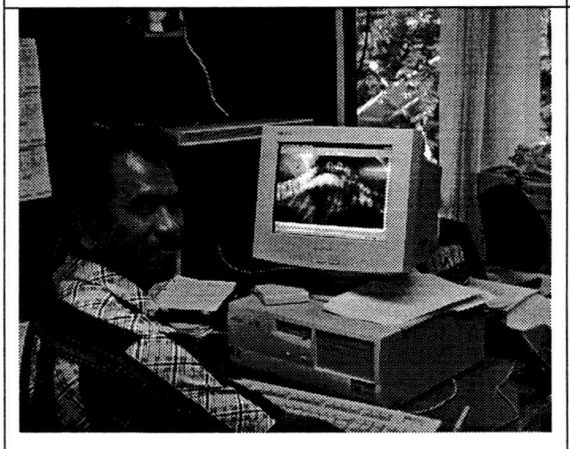
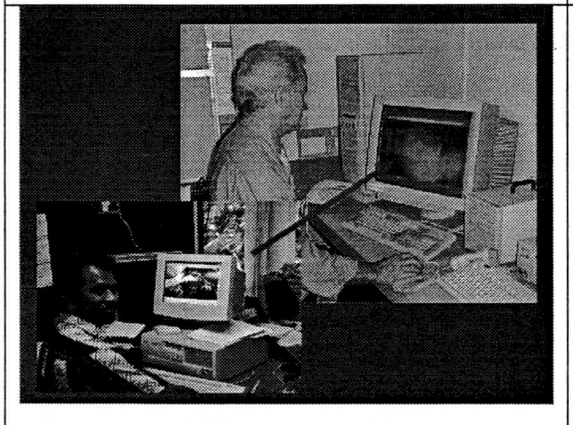
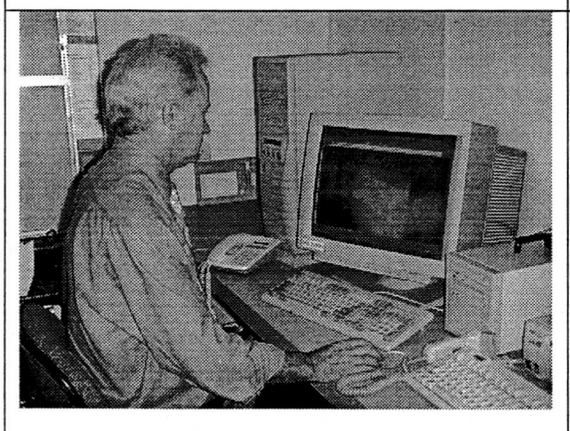
- Due to the investment and dependence of SURF on databases and their access through the internet, we are urgently seeking solutions to increasing affordable bandwidth.
  - A rapid solution to FIG ISP issue
  - SITA solution
  - UN System hub

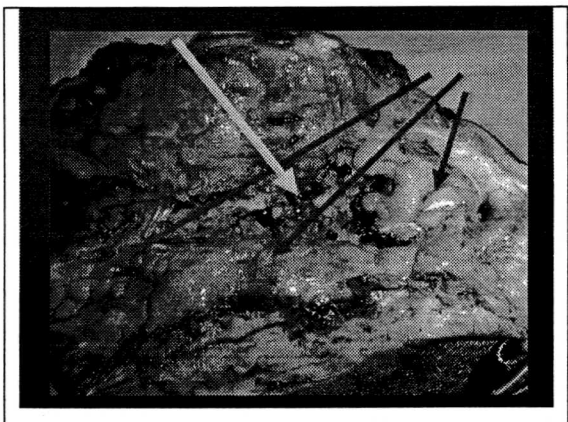
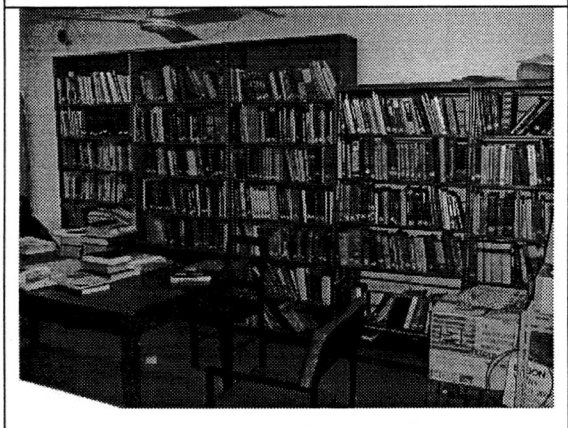
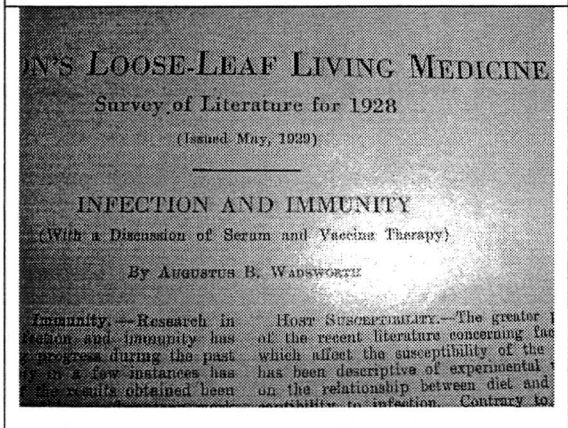
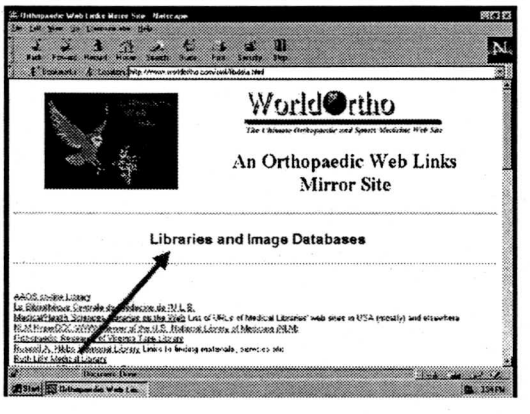
TANGIO TU MAS

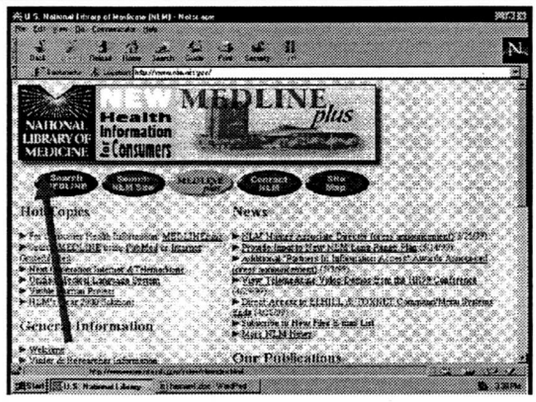
APPENDIX 19 – A SPECIALIST SURGEON'S CASE STUDY

User Challenges – "Mercy Mission", a Specialist surgeon's Case Study by Dr Herman Oberli

	**Slide 1.** The Central hospital in Honiara is the only tertiary medical institution in the Solomon Islands where more than 8,000 patients are admitted per year and more than 50,000 consultations are held at the general out patients and Accidents & Emergency departments. Three different situations illustrates the use of IT applications to solve difficult problems.
	**Slide 2.** The Central Hospital in Honiara as seen from the Forum Fisheries Agency office.
	**Slide 3.** **Case One**: This 16 years old girl presented with a severe deformity of her spine which cannot be treated locally. Digital pictures of the patient and of her x-ray file were sent to specialists overseas in order to get advise on how to manage this crippling condition.

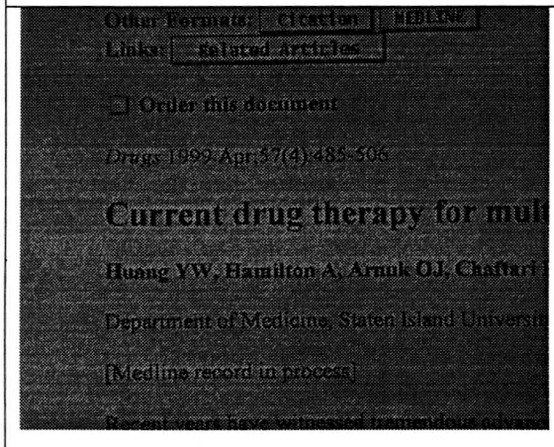
	**Slide 4.** Digital photos of the x-ray films were saved as JPEG files on floppy disk and the disk was hand carried to the Forum Fisheries Agency IT staff ....
	**Slide 5.** ... the digital files were attached to an email message and ...
	**Slide 6.** ...sent to a specialist in Australia for radiology.
	**Slide 7.** ... the radiologist had a close look at his screen and called in a spinal surgeon to view the films. The surgeon was so impressed by this case that he immediately arranged free treatment for our patient by his hospital.

	**Slide 8.** **Case Two:** This is a special type of cancer destroying the patient's femur and we did not know the best management we could provide within our limited resources.
	**Slide 9.** The library at the Central Hospital looks quite impressive if you do not stand too close to the shelves so that you cannot read the dates of the publications.
 N'S LOOSE-LEAF LIVING MEDICINE Survey of Literature for 1928 (Issued May, 1929) INFECTION AND IMMUNITY (With a Discussion of Serum and Vaccine Therapy) By Augustus B. Wadsworth Immunity.—Research in ... progress during the past ... in a few instances has ... the results obtained been Host Susceptibility.—The greater ... of the recent literature concerning fac... which affect the susceptibility of the ... has been descriptive of experimental ... on the relationship between diet and	**Slide 10.** Some of the books in the library should rather belong to a medical museum. No Help was available from the old publications in the library.
 WorldOrtho An Orthopaedic Web Links Mirror Site Libraries and Image Databases	**Slide 11.** Up to date information was accessed on the World Wide Web (WWW) via the Forum Fisheries Agency's Internet connection to the outer world.



Slide 12.

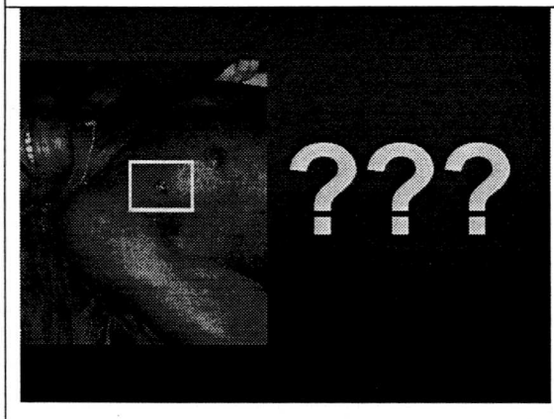
World's leading medical libraries could be searched for advise and information from one of the most remote hospitals in a less developed country.



Slide 13.

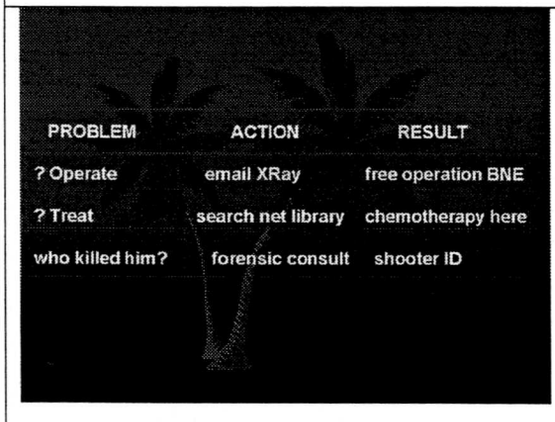
On the Web sites of the leading medical libraries all latest information on bone tumours was retrieved immediately.

Some information was so recent that the printed version of the articles was probably not yet available in many libraries of the industrialised world.
Our patient could be treated locally based on the most recent information.



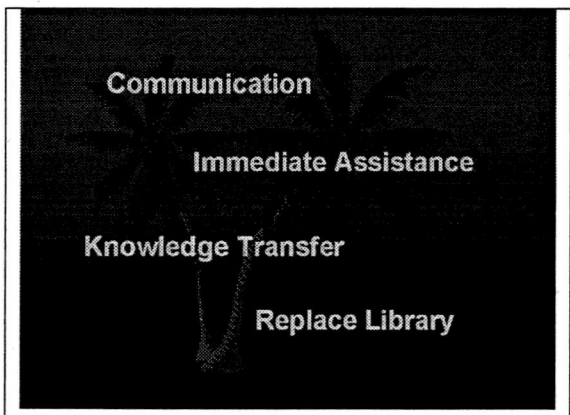
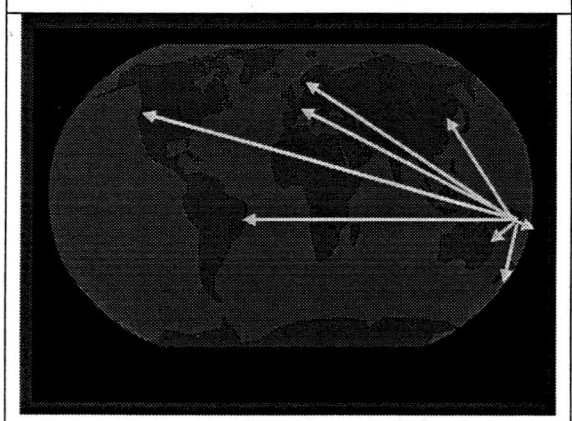
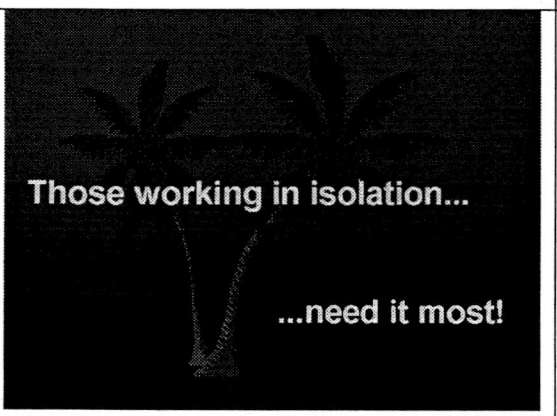
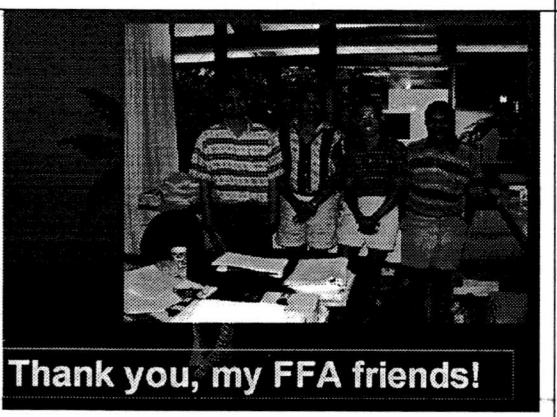
Slide 14.

Case Three:
The public prosecution asked for expert opinion on the nature of this gunshot wound for forensic purpose.
A digital picture was sent by email to a forensic pathologist overseas and very crucial information was provided immediately by the contacted specialist.



Slide 15.

This table summarises the three cases, actions taken and resulting outcomes.

	**Slide 16.** These are four possible areas where applied Information Technology is of paramount importance to remote medical services worldwide.
	**Slide 17.** In developing countries specialists are scarce and the medical problems sometimes are of a complexity which is unheard of in the industrialised world. A wide network of specialist contacts in many continents is needed in order to deal with many medical problems in a satisfactory way.
	**Slide 18.** The people working in the most remote areas of the world depend heavily on the modern IT and Communications infrastructure and need it the most. In poor countries like the Solomon Islands, access to such technology is often not as affordable as we would like it to be.
	**Slide 19.** My sincere thanks to the Director and all the very helpful and always friendly IT staff of the Forum Fisheries Agency.

APPENDIX 20 - FFA'S CORPORATE DATA RESOURCE FACILITY

Introduction

FFA Corporate Data Resource (CDR) is regarded as one of the key IT developments at FFA (since 1994) having a profound impact on the organisation, quality and use of business data within FFA.

CDR can be defined as a comprehensive and integrated framework which defines objectives, principles and strategy for FFA data management. It includes data and process modelling methods, design and development standards for databases and applications as well as the system integration principles. CDR however is far from being a theoretical concept. During the three year period (July 1994 - June 1997), the FFA data management foundation was established (including the FFA Corporate Data Model), and subsequently six highly integrated applications were developed and put into production. These applications are used for managing and improving core business processes and data.

Current Status of CDR

As a platform for managing FFA's data resource, CDR has delivered important results during the four year period, 1994-1997. These results can be grouped into two broad categories:

- **General** - Defining the strategy and establishing the foundation for sound management of fisheries and related data, with the objective of maximising its quality, timeliness and useability,

- **Specific** - Development and implementation of six core business applications.

GENERAL CDR ACHIEVEMENTS

The key results that are applicable to the overall management of data at FFA, and which also have implications for member countries, are summarised below:

DATA MANAGEMENT FOUNDATION

It is important to say that this foundation was established at the very start of CDR development and has been used since with very little modification. The foundation is essentially comprised of:

- Data management and data modelling standards, guidelines and principles,

- FFA Corporate Data Model for Core Business Areas,

- The introduction and acceptance of the 'CDR Objective'
  "To maximise the quality, timeliness and useability of the Corporate Data Resource, where corporate data resource includes both business data (eg. Vessel, Catch, Marine Product, Agreement, Country, Project, Account, etc.) and systems data (eg. Entity, Attribute, Process, Program, Database)."

INTEGRATED CDR DATABASE

Fisheries and other relevant data managed by CDR reside in a highly integrated and well organised database which is shared between applications and used by all business users. This database also represents an important source of data for other systems outside CDR, such as VMS for example.

STANDARDISED COMPUTING ENVIRONMENT

Computer technology used for the development and implementation of CDR includes up-to-date software and hardware and is characterised with:

- Client-Server computing environment with client PC's running Microsoft Windows95/98 and the database server running UNIX operating system,
- Relational Database (ORACLE Ver 7.3.2),
- Graphical User Interface (GUI) developed using Microsoft Access,
- ODBC software for database connectivity,
- Standard networking protocols such as TCP/IP.

APPLICATION DEVELOPMENT STANDARDS AND COMMON USER INTERFACE

All CDR applications are based on standards developed with the objectives to:

- Assist developers in building applications timely and efficiently,
- Achieve high levels of software quality and minimise time and effort required for program maintenance,
- Create systems that closely satisfy user requirements,
- Establish common, consistent and easy-to-use user interface across the applications portfolio.

(NB. For more details, see references No 1. - Volume III, and No 9.)

CDR AS A CHANGE AGENT

During the four-year period, CDR has played a quiet but driving role in changing old perceptions and developing new attitudes and appreciation for proper data management practices. The concepts of data modelling, data integration and data sharing are now better understood and generally accepted. Business objectives are more and more seen as being dependent on timely and quality information.

SPECIFIC CDR ACHIEVEMENTS

VESSEL ACTIVITY AND CATCH SYSTEM (VAC) - A BRIEF HISTORY.

Vessel Activity and Catch system was developed and put into production in October and November 1994. Data from the superseded MFTIS system was migrated into the new database. The migration exercise proved to be a huge and non-trivial task since the MFTIS database was unstructured and contained inconsistent, redundant and even wrong data.

The VAC system has been upgraded several times to cater for new or changed business requirements. A major sub-system for managing the FSM Arrangement was developed and integrated into VAC in the first half of 1995 and subsequently amended in December 1995.

VESSEL ACTIVITY AND CATCH SYSTEM (VAC) - CURRENT STATUS.

Within the South-Western Pacific region there are currently two multilateral agreements on Purse Seine fishing. These agreements are:

- Treaty on Fisheries Between the Governments of Certain Pacific Island States and the Government of the United States of America,
- Federated States of Micronesia Arrangement for Regional Fisheries Access.

The significance of these agreements for the regional fisheries and participating island countries is immense. FFA had been given the role of the administrator for both agreements. This is a complex role critical for ensuring that agreement objectives are achieved.

The Vessel Activity and Catch system (VAC) was designed and built to provide means for effective and successful administration of these two multilateral agreements. At the same time, the overall VAC functionality can be extended to incorporate requirements for administration of any future multilateral agreements on Purse Seine fishing in the region. Furthermore, VAC can be used as a template for systems that would manage data on activities and catch of other types of fishing vessels, such as Longline and Pole and Line.

VAC Data

The following essential data is managed using the VAC system:

- Positions (ie. geographical locations) and other control information such as catch on board of vessel, intended activity, etc. reported by vessels during the course of their fishing trips.
- Fishing trips undertaken by individual vessels including details on departure and return dates and ports, and various control dates.
- Date and time, position and other details of individual activities performed by individual vessels as part of their fishing trips (reported using logsheets).
- Details of vessel catch activities.
- Types and quantities of species (fish) harvested during individual catch activities (including target species, by-catch and discards).
- Vessel Licences issued under multilateral agreements.
- Unloading (transhipment) activities including details on fish destinations and fish recipient (canneries and fish carriers).
- Eligibility criteria and register of eligible vessels under the FSM Arrangement.

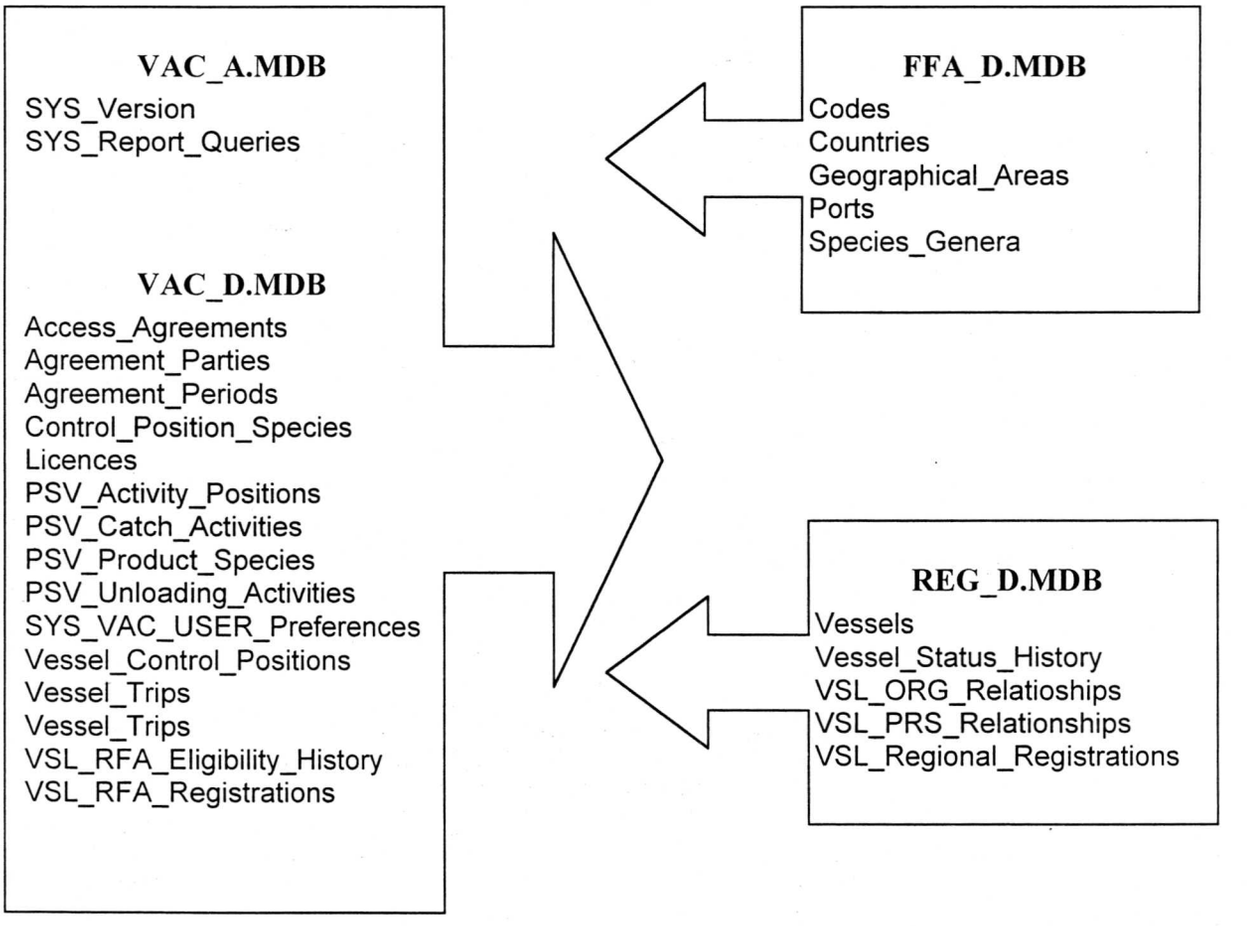
VAC Functionality

Business requirements fulfilled by the VAC system include:

- Collection, data entry and verification of fishing trips control data.
- Analysis of vessels' reporting compliance and production of control reports.
- Collection, data entry and verification of catch data for individual vessels.
- Analysis and reporting of catch data as required by the US Treaty.
- Analysis and reporting of catch data as required by the FSM Arrangement.
- Other analyses of catch data across different parameters such as species, zones, time periods, etc.
- Maintenance and viewing of unloading data and cross-checking with vessel reporting.
- Issuing of vessel licences under the two multilateral agreements.
- Preparation of annual reports for both agreements.
- Administration of the Register of eligible fishing vessels for the FSM Arrangement.
- Standardisation of vessel types, species types, fish school types and associations, geographical area (zone) types, etc.

- Elimination of data redundancy and inconsistency found in previous systems.
- Possibility for providing interfaces to other standard packages such as Microsoft Word and Excel or MapInfo which can be used to analyse and present data in various formats.
- Possibility to extract data for member countries and distribute it electronically without delays.
- Possibility for easy addition of new queries and reports etc.

VESSEL ACTIVITY AND CATCH (VAC) INTEGRATION



REGIONAL REGISTER SYSTEM (REG) – A BRIEF HISTORY.

Regional Register system was already in place at the start of CDR. It did however require modifications and additions not just to be fully integrated within the CDR Applications Portfolio, but also to satisfy various additional user requirements. This development was completed in the first half of 1995.

In November 1995, a sub-system for managing 'vessel sightings' was incorporated into REG system. This additional functionality enabled recording and analysis of various events when vessels were sighted within EEZ's of FFA member countries.

REGIONAL REGISTER SYSTEM (REG) – CURRENT STATUS.

The Regional Register system (REG) was initially developed to enable effective administration of the Regional Register of Foreign Fishing Vessels. This register has a key role for many aspects of fisheries management in the South-Western Pacific region, and particularly for the monitoring, control and surveillance objectives.

All vessels from DWFN countries involved in fishing activities within the region are required to be registered on the Regional Register. The registration has to be renewed annually and is a prerequisite for issuing fishing licences. With the implementation of the FSM Arrangement, the requirement for inclusion on the register was extended to include local vessels that fish in the waters of other regional countries.

Each vessel recorded in the REG database is assigned a unique identification number - VID (Vessel ID). This number is essential for effective identificaion of vessels and for cross-referencing of all fisheries management data such as: Access Agreements, Vessel Licences, Violations and Prosecutions, Vessel activity and catch data, Observer data, etc.

The REG system has been upgraded several times to include new features, eliminate certain deficiencies and improve the user interface. It now has a broader scope than in the beginning, since it has been recognised that all Vessels, local or foreign, involved in any fishing activity within the region should be recorded in the REG database. Consequently, the REG database is no longer limited to only those Vessels that must be registered under the provisions of the Regional Register. This makes the REG database a unique and comprehensive repository of fishing Vessels' information and also improves the integration and quality of all regional fisheries management data.

REG Data

The following essential data is managed using the REG system:

- Vessel details, including name, type, IRCS, country of registration, technical characteristics, fishing gear, etc.
- Full history of vessel regional registrations including the current one.
- Full history of any changes in vessel status in relation to the regional registration.
- Current and previous vessel captains, including dates when changes occurred.
- Current and previous vessel fishing masters, including dates when changes occurred.
- Current and previous vessel owners and charterers, including dates when changes occurred.

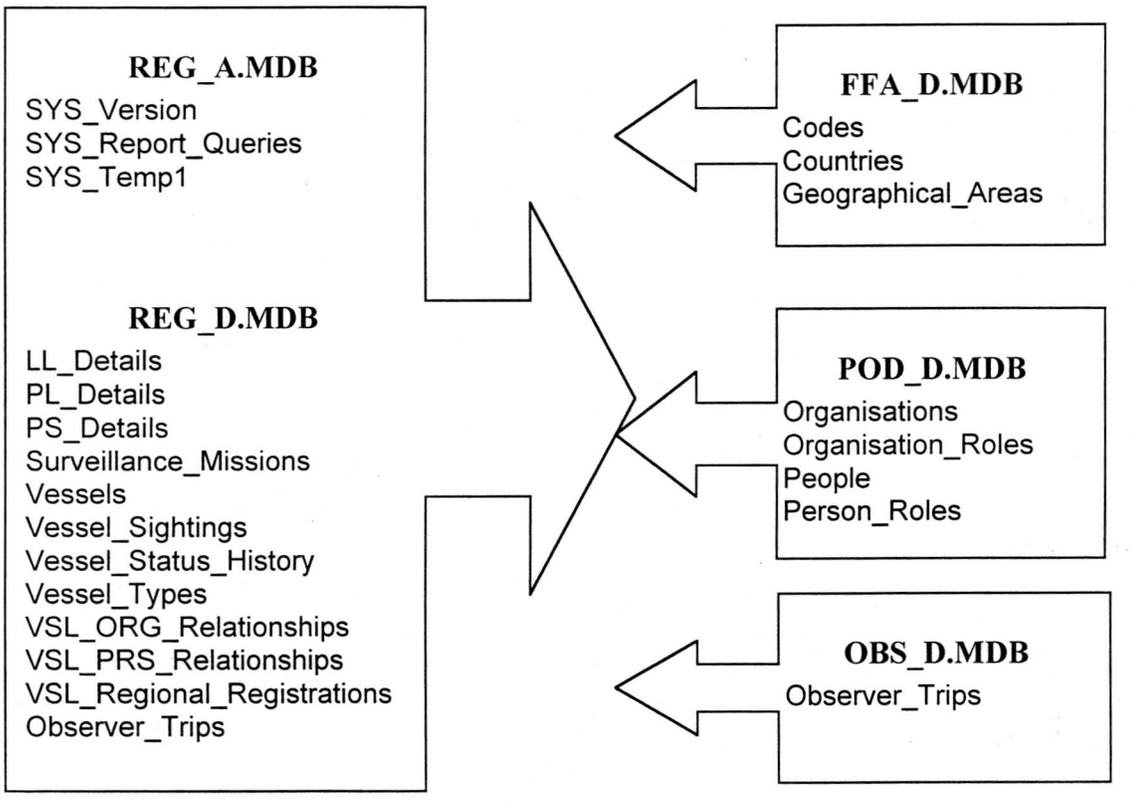
- Details on surveillance missions and sightings of vessels in the regional waters, including vessel markings and type, date and time, position, activity, etc.

REG Functionality

Business requirements fulfilled by the REG system include:

- Administration of the Regional Register of Foreign Fishing Vessels, including annual registrations, printing of registration certificates, status changes, etc.
- Recording and management of data on all other vessels that may be of interest to FFA and member countries. For example, these may include local vessels that are not required to be on the Regional Register but are licensed to fish in the waters of their own country and consequently are of interest to the users of the FAL system.
- Management of historical data. The complete history of Vessel Owners, Vessel Charterers, Vessel Captains and Fishing Masters can be recorded and easily queried. Additionally, the history of all changes to a vessel's status is provided, including the offence type that has triggered the status change.
- Recording and analysis of Vessel sightings reported by aerial surveillance and other sources. This is important in detecting possible violations and identifying offending vessels.
- Easy searching, browsing and on-screen viewing of vessel and other REG data.
- Various queries and reports on REG data with a possibility for easy addition of new ones.
- Possibility for providing interfaces to other standard packages such as Microsoft Word and Excel or MapInfo which can be used to analyse and present data in various formats.
- Possibility to extract data for member countries and distribute it electronically without delays etc.

REGIONAL REGISTER(REG) INTEGRATION



PEOPLE AND ORGANISATIONS DATABASE SYSTEM (POD) – A BRIEF HISTORY.

People and Organisations Database system was developed and put into production in May and June 1995. It was integrated with the other two applications (VAC and REG) and has become a central reference for data on people and organisations relevant to FFA and its member countries. A major migration exercise was also required to incorporate data essential for VAC and REG systems.

PEOPLE AND ORGANISATIONS DATABASE SYSTEM (POD) – CURRENT STATUS.

The People and Organisations Database system (POD) was developed to manage data on People and Organisations that are of interest to FFA and the fisheries management in the South-Western Pacific Region in general. The POD database serves as a central and integrated repository of People and Organisations, and records not just the essential details like names and addresses, but more importantly the profiles and types of business relationships ('roles').

The significance of the POD system is essentially twofold:

- **FFA Contacts**. A very specific role that FFA has as an organisation requires extensive direct contacts with numerous individuals and organisations throughout the region and elsewhere. POD system records and manages data on all these individuals and organisations.

- **Fisheries Management**. Virtually every aspect of fisheries management in the region involves many individuals and organisations that play different roles such as: Vessel Owners, Operators and Agents, Vessel Crew (in particular Captains and Fish Masters), Observers, Surveillance organisations and personnel, Canneries and other commercial organisations, Scientific and Educational organisations, various Government organisations and personnel, etc. The entire set of CDR applications makes use of data on these people and organisations and consequently it is essential to have this data recorded as part of POD database.

POD Data

The following essential data is managed using the POD system:

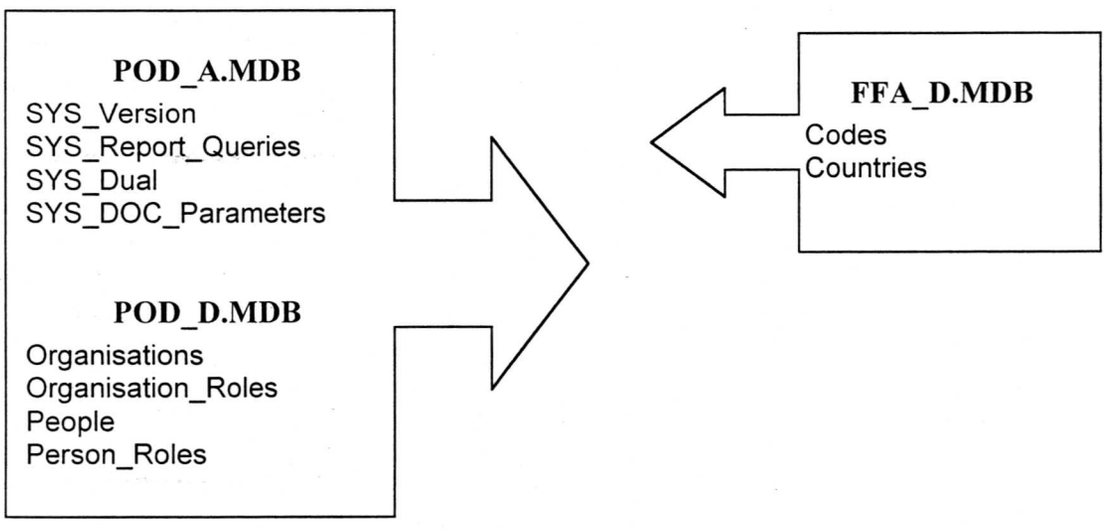
- Details on individuals (people), including name, address, contact details, organisation the person is associated with, etc.
- Person 'roles', ie. business relationships in terms of dealings and connections with FFA or other relevant parties.
- Details on organisations (companies), including name, address, contact details, person in charge (ie. manager), etc.
- Organisation 'roles', ie. business relationships in terms of dealings and connections with FFA or other relevant parties.
- Standard categories of person and organisation roles.

POD Functionality

Business requirements fulfilled by the POD system include:

- Management of data on all people and organisations that are of interest to FFA.
- Provision of a central reference point for data on individuals and organisations (the POD database), which is used not just by all CDR applications, but also by other major systems such as VMS.
- Classification and grouping of people and organisations based on specific interests that FFA has in different individuals/companies (by means of roles).
- Provision of data extraction facility for other programs that use people and organisations data (such as Lotus Organizer).
- On-screen searching, browsing and exploring of POD data.
- Provision of various queries and reports on POD data.
- etc.

PEOPLE AND ORGANISATIONS (POD) INTEGRATION



OBSERVER DATABASE SYSTEM (OBS) – A BRIEF HISTORY.

Observer Database system was identified as a separate CDR application in September 1995, when the initial OBS data model was developed. Although closely related to the VAC application, OBS has a different perspective on the US Treaty and is required to manage large amounts of data collected by observers. The system was fully developed and implemented in the first half of 1996.

OBSERVER DATABASE SYSTEM (OBS) – CURRENT STATUS.

As part of FFA's corporate Monitoring, Control and Surveillance Programme and objectives, the Regional Observer Programme plays a significant role in sustainable management of fisheries resources. Since the beginning of the USA Treaty, a large amount of data has been collected by Observers. The FSM Arrangement also has a requirement for an Observer programme. Many FFA member countries already have national Observer programmes or are in the process of implementing one.

The information collected by observers can be used in several ways. These include the verification of activities and catch reported by fishing vessels and whether the agreement requirements are violated or not. Various scientific data is also captured on Observer Forms during trips.

In order to enable effective management and use of observer collected data, the Observer Database System (OBS) is developed and integrated into the CDR platform.

OBS Data

The following essential data is managed using the OBS system:

- Details on each Observer Trip on board of fishing vessel, including trip identification, departure and return dates and ports, comments on vessel reporting and activities, etc.
- Detailed vessel characteristics including fishing gear, electronics equipment, fish storage wells, etc.

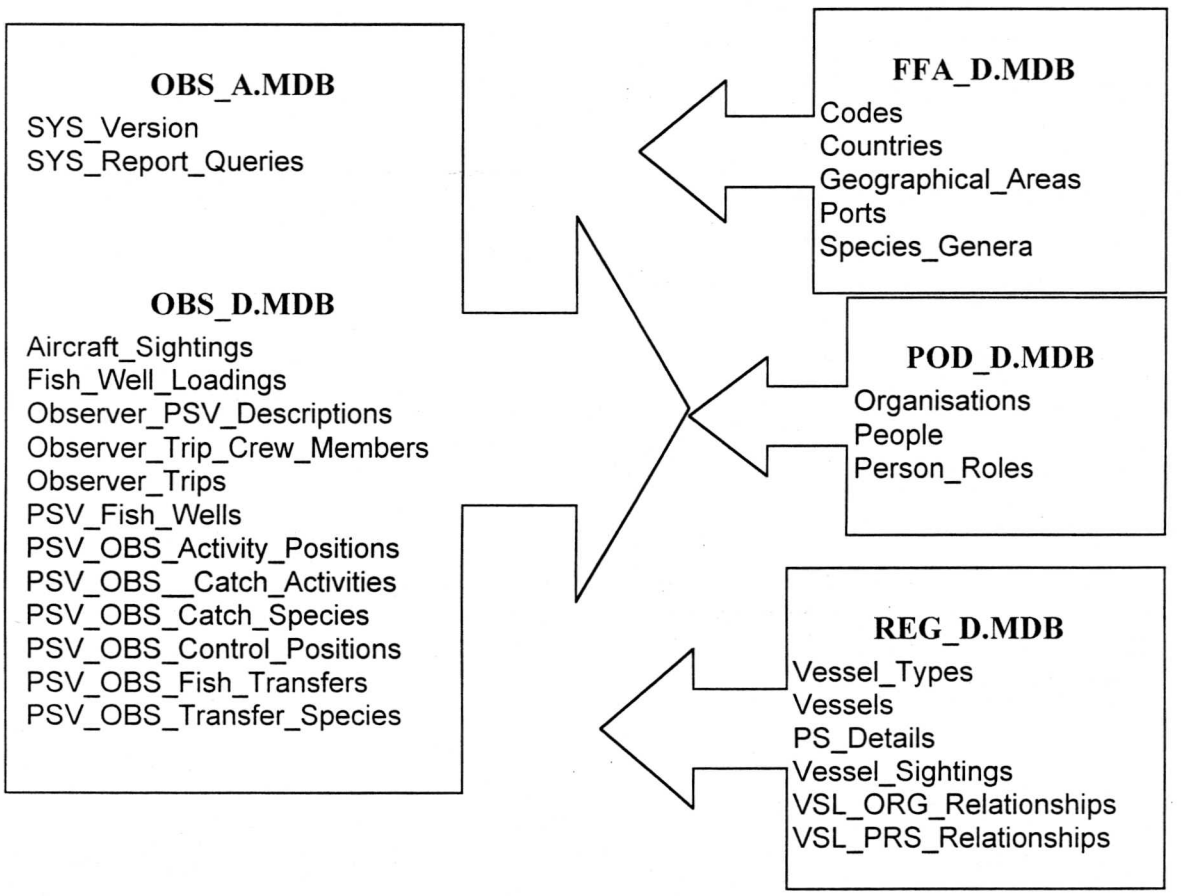
- Vessel crew for the trip, including person name, nationality, position, etc.
- Vessel activities during the trip, including activity type, date and time, geographical location, environmental conditions, etc.
- Precise details on each catch activity.
- Precise details on catch harvested by the vessel, including species involved, total amount, weight range, the outcome (eg. retained or discarded), etc.
- Vessel reporting and other compliance requirements.
- Sightings and activities of other vessels and aircraft in the region.

OBS Functionality

Business requirements fulfilled by the OBS system include:

- Structured organisation and storage of data collected through Observer workbooks and forms.
- Analysis of observer data and dissemination to relevant management agencies for action as appropriate.
- Using observer data to ensure vessels' compliance to conditions of Access Agreements.
- Easy searching, browsing and on-screen viewing of information stored in the database.
- Possibility to cross-reference observer data to vessel and cannery data.
- Production of reports for FFA internal use and for distribution to member countries.
- Possibility for providing interfaces to other standard packages such as Microsoft Word and Excel or MapInfo which can be used to analyse and present data in various formats.
- Possibility to extract data for member countries and distribute it electronically without delays.
- Possibility for easy addition of new queries and reports.
- Provision of data that can be used by other regional fisheries organisations, including certain scientific data etc.

OBSERVER DATABASE SYSTEM (OBS) INTEGRATION



FISHERIES AGREEMENTS AND LICENCES SYSTEM (FAL) – A BRIEF HISTORY.

Fisheries Agreements and Licences system was developed in two stages. The first stage included the VL/FAL component for management of Vessel Licences. This was put into production in the second half of 1996. Migration of existing licence data stored in a stand-alone database was also required. The second stage provided functionality for recording and analysis of Fisheries Agreements. The final implementation and integration of the entire FAL system was completed at the beginning of 1997.

FISHERIES AGREEMENTS AND LICENCES SYSTEM (FAL) – CURRENT STATUS.

Fisheries Agreements and Licences system (FAL) was developed to enable effective management and use of data on various fisheries Agreements (also known as Access Agreements) and Vessel Licences.

Fisheries agreements can be grouped into two broad categories: multilateral ones that involve several countries (such as US Treaty and FSM Arrangement) and bilateral ones between two countries. Each agreement specifies, amongst other things, conditions and other details related to issuing of fishing licences. Vessel intending to fish in the regional waters must have a valid and current licence.

The main users of the FAL system are FFA's Economic and Marketing Division and Monitoring, Control and Surveillance Division. Data on licences is also essential for other systems outside CDR, for example VMS.

FAL Data

The following essential data is managed using the FAL system:

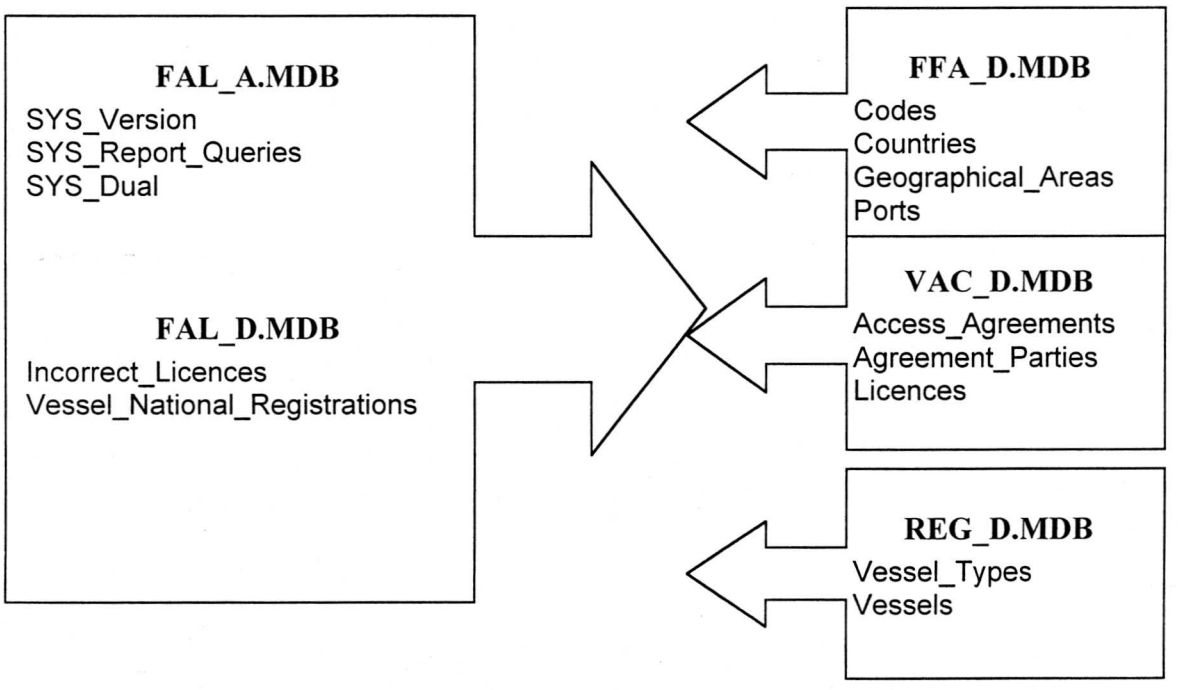
- Identification details on bilateral and multilateral Access Agreements between the FFA member countries and DWFN countries. For each Agreement all parties are recorded and they can include not just countries but also organisations from these countries.
- Other details about each agreement, including effective and expiry dates, the types and numbers of vessels allowed to fish, types and amounts of fees payable to the owner country, etc.
- Details on vessel licences issued by FFA member countries, including licence number, validity dates, vessel to which the licence is issued, agreement under which the licence is issued, etc.
- Transient data received from FFA member countries that include unverified licence information.

FAL Functionality

Business requirements fulfilled by the FAL system include:

- Recording and maintaining data for individual fisheries agreements.
- Collecting, recording and maintaining data for individual vessel licences. This also includes verification of data provided by FFA member countries.
- Providing a fast and easy way to determine if a particular vessel is licensed to fish or not.
- Providing data useful for economic analyses on the value of fishing agreements.
- Establishing a reporting and analysis mechanism that provides answers to various queries such as:
  - Which bilateral agreements are in place between the selected FFA member country and DWFN countries,
  - What are the bilateral agreements between the selected DWFN country and FFA member countries,
  - How many vessels have been issued a licence under the selected bilateral agreement as compared to the maximum allowed number,
  - How many licences are issued by vessel type and country,
  - Which vessels have actually fished under the certain Agreement,
  - Which vessels have current licences for fishing inside the waters of FFA member countries, etc.
- Searching, browsing and on-screen viewing of agreements and licences data.
- Possibility to extract data for member countries and distribute it electronically without delays.
- Possibility for easy addition of new queries and reports etc.

FISHERIES AGREEMENTS AND LICENCES (FAL) INTEGRATION



VIOLATIONS AND PROSECUTIONS SYSTEM (VAP) – A BRIEF HISTORY.

Violations and Prosecutions Database system was developed towards the end of 1996 and early in 1997 when it was put into production. It is used to manage data on violations committed by vessel captains, owners and other individuals and organisations involved in vessels' operations. All relevant details on penalties and court prosecutions are also recorded. VAP was the last system incorporated into the CDR Applications Portfolio.

VIOLATIONS AND PROSECUTIONS SYSTEM (VAP) – CURRENT STATUS.

Protecting their fish resource from illegal and irresponsible use is essential for all island countries of the South-Western Pacific region. This is a very difficult task giving the sheer size of the regional fishing grounds and therefore incidents of violations are quite regular. Offenders that are caught are liable to substantial fines and can also be subject to court prosecutions.

The Violations and Prosecutions system (VAP) was introduced to enable effective management and use of data on violations committed by fishing vessels in the region, as well as court prosecutions held as a result of these violations. As such, the VAP system represents a useful tool for FFA's Monitoring, Control and Surveillance and Legal Services Divisions in assisting member countries in the above mentioned task.

VAP Data

The following essential data is managed using the VAP system:

- All violation details, including vessel and captain involved, date and time of the event, category of the offence committed, amount of catch involved, who has observed and reported the incident, etc.
- Current status of the violation case as well as the history of the case.
- Details on the outcome of the violation case, including the type of outcome, fine imposed, whether vessel, gear or catch were forfeited, etc.
- Definition of standard categories of violations and types of violation outcomes.
- Details on prosecution cases, including date, location, court and judge, the defending individuals and organisations, verdict, fines that were imposed, etc.

VAP Functionality

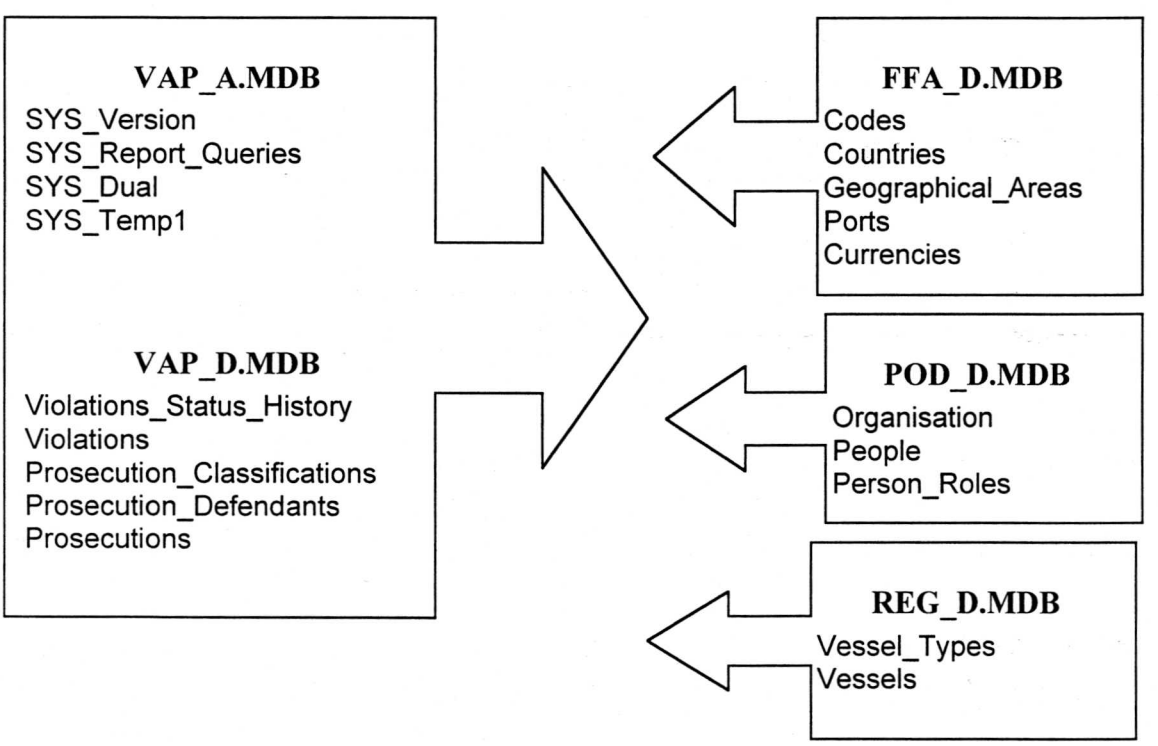
Business requirements fulfilled by the VAP system include:

- Recording and maintaining data for individual violations and their outcomes.
- Recording and maintaining data for prosecution cases.
- Standardisation of violation types and their outcomes.
- Classification of prosecution cases for easier reference by legal professionals.
- Possibility to identify frequent offenders.
- Establishing a reporting and analysis mechanism that provides answers to various queries such as:

- What are the previous convictions (if any) for an individual or a company,
- Has a vessel been involved in any violations and if so, what were these violations,
- How much a country has received (in monetary terms) as a compensation for violations in its EEZ,
- Which fishing country has the worst record for the violations committed by vessels registered in this country, or operated by companies from this country,
- How many violations were reported by aerial surveillance,
- How many violations have resulted in prosecutions, etc.

- Easy on-screen browsing and viewing of VAP data.
- Elimination of shortcomings found in the previous stand-alone user developed system.
- Possibility to extract data for member countries and distribute it electronically.
- Possibility for easy addition of new queries and reports.

VIOLATIONS AND PROSECUTIONS (VAP) INTEGRATION



CDR Security

Security mechanism for the FFA CDRM is based on the specification defined in the Applications Development Standards and Guidelines document. This specification has been further refined to include additional category of users, namely 'system developers' (or 'system owners').

The main concepts involved in the definition of security mechanism are:

- **User** - A person identified by the unique 'user name' (or 'user code') that can access and use application systems. The exception to this definition are users called 'system owners' (described later) since they do not represent a physical person.
- **User Group** - A collection of users that all share the same 'rights' in accessing application systems.
- **Application Object** - A single component of an application system that can be protected from unauthorised access. Application objects are: (database) tables, queries, forms, reports, macros and modules.
- **Owner** - A special user that has all the rights for an application object and can restrict other users from accessing this object. In the FFA CDRM environment all objects that form a single application are owned by a single user (also called 'system owner' or 'system developer'). The name that identifies a system owner is in the form of: *xxx_dev*, where *xxx* is the three letter code of the relevant system. For example *reg_dev*, *pod_dev* and *vac_dev* are the system owners for the REG, POD and VAC systems respectively. System owners belong to a special user group called FFA DBA.
- **Permission** - A right (privilege) assigned to a user group (or an individual user) to access an application object in a certain way (eg. read, write, delete, etc.). For the FFA CDRM applications all permissions are defined on a user group level which makes the security administration much easier.

Note: Within the MS Access environment there are three default user groups, namely Admins, Guests and Users. To make an application secure it is important to revoke all permissions from these three groups.

SECURITY MECHANISM EXAMPLE - POD SYSTEM

The user groups for the POD System are: *POD Admins*, *POD Users* and *POD Guests*. A single user can belong to only one of these three groups. (Note that this does not prevent a user from being a member of user groups for other applications. For example user *xyz* can belong to *POD Users* and *VAC Guests* at the same time). The following diagram shows the POD security setup:

POD Security Setup

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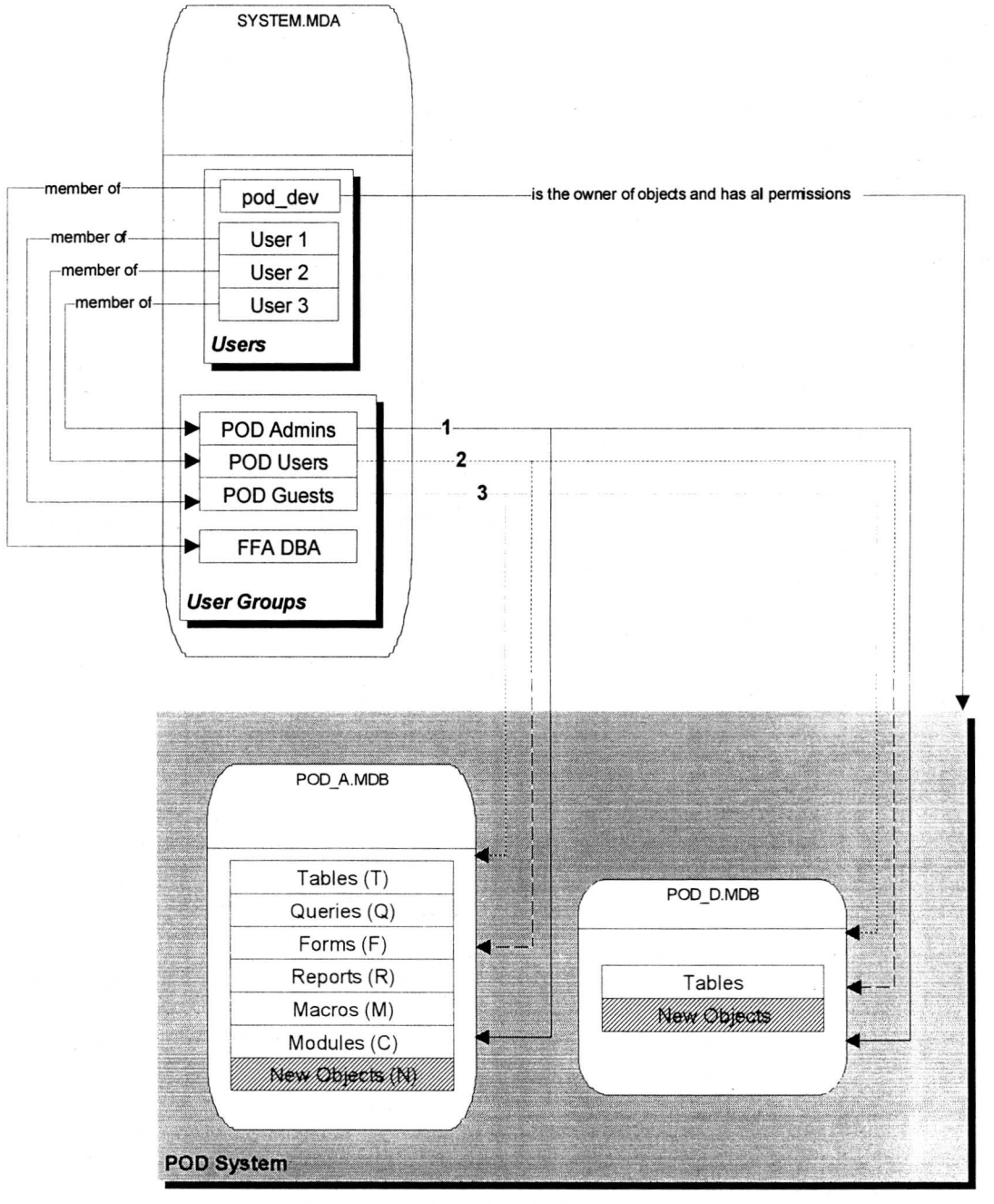


1 - Read, Update, Insert and selective Delete permissions for T & Q objects,
Open / Read for F, R, M and C objects,
no permissions for N objects.

2 - Read, Update, Insert and selective Delete permissions for T & Q objects,
Open / Read for F, R, M and C objects,
no permissions for N objects.

3 - Read permissions for T & Q objects,
Open / Read for F, R, M and C objects,
no permissions for N objects.

Future Potential

This section presents some thoughts on the future potential and role of the CDR platform and its applications, in relation to the FFA's business and management of regional fisheries in general. Some recommendations on how to maximise the value of CDR (both now and in the future) are also given.

CONTINUED SUPPORT FOR FFA MISSION AND BUSINESS OBJECTIVES

The 'CDR Objective' is clearly and strongly aimed at providing the best possible support (from the Information Technology perspective) for the FFA's mission statement and business objectives. This support should remain in place regardless of any possible changes to the tactical or strategic perspective of FFA's business. The CDR, as a firmly and soundly established data management platform, is capable of evolving and adapting to such changes.

RECOMMENDATIONS

One of the key things to realise in relation to the FFA's CDR platform, is that it should be viewed as a 'live' environment that has a demonstrated value for FFA and its member countries. This means that it should not only be regularly maintained for optimal use, but more importantly, it should be allowed to improve and evolve together with the dynamic environment in which FFA operates for the benefit of its member countries.

The first two recommendations given are quite specific and should be addressed in the near future. The other four are presented more as guidelines and have a strategic perspective.

REVIEW AND OPTIMISE CDR UTILISATION AT FFA

CDR applications are used within all FFA programmes and have significant number of users. The underlying integrated database holds information that not only extends across departmental boundaries, but is essential for other major systems like VMS. In the light of this, it is important to conduct regular reviews of the current utilisation, operation and performance of CDR.

The main objective of this review will be to ensure that CDR systems are utilised in an optimal way and that all critical information is kept complete and up to date.

The review will basically involve the following activities:

- Identify any potential obstacles that may result in under-utilisation of applications. For example, it is possible that there are certain deficiencies in current work procedures (both manual and computerised). It is also likely that business users will have requirements for additional queries and reports, or other comments and suggestions that can improve the utilisation and overall value of CDR.

- Investigate whether links to all information sources are in place and whether they operate in the most effective way. Information sources include various member countries' departments and officials (such as Licensing Officers), Vessel Operators, Observers and other external sources. This is critical to ensure the reliability, completeness and adequate frequency of incoming data.

- Analyse system performance and identify and eliminate any 'bugs' in program code. In other words, make sure that there are no outstanding problems on the system level that will hinder applications' utilisation.

COMPLETE THE ORIGINAL CDR APPLICATIONS PORTFOLIO (MARINE PRODUCT PRICING)

Marine Product Pricing (MPP) is one of the core business areas originally defined in the FFA Corporate Data Model. Its significance was identified by business users and consequently it was included in the data model and the proposed set of applications.

MPP essentially deals with data on Marine Products (tuna in particular), Product Markets and Market Prices, as provided by various information sources. It also takes into account different product forms, size categories and quality categories. This data is particularly important for various economic analyses and forecasts and is essential for determining the value of catch.

Marine Product Pricing is the only application from the original FFA Corporate Data Model that has not been implemented yet. The recommendation is to design and develop this system and incorporate it into CDR data management platform. This will achieve the complete integration of all FFA core business data making it available to business users across the organisation.

MAXIMISE THE VALUE OF CDR FOR MEMBER COUNTRIES

The overall value of CDR can not be assessed only by its use and contribution to the data management at FFA. It is clear that as much as business objectives of the Forum Fisheries Agency are aligned with the objectives of its member countries, the objective of CDR should be to maximise the quality, timeliness and useability of regional fisheries data in general.

It is believed that CDR results have already had positive implications on data management in member countries. In order to maximise this influence, it is recommended to address the following tasks:

- Review the current utilisation of CDR systems and data by individual FFA member countries.
- Encourage FFA to take a pro-active role in providing the benefits of CDR to member countries. Determine where and how this can be accomplished.
- Identify key areas where the CDR concept and its applications can be actively deployed in the member countries. The objective is to:
  - Improve individual countries' fisheries data management, and
  - Establish a common data management platform between FFA and its member countries.

COOPERATION WITH OTHER REGIONAL ORGANISATIONS

A nice example of cooperation between regional organisations, in relation to the management of fisheries data, has been the 'Meeting on Tuna Fisheries Data Collection Forms' held in Brisbane, Australia on 11-14 December 1995. The participating organisations, SPC and FFA, had their teams working together on the design of standard data collection forms for use throughout the South-Wester Pacific region. The common forms have important implications such as: improved quality of data, reduced cost and effort involved in data collection and exchange, etc.

This exercise was quite successful and the forms have been introduced and accepted by all involved parties.

There are also many other areas where regional organisations can (and should) work together to achieve common objectives. Some of the issues that need to be addressed include:

- Information sharing and distribution,

- Standardisation in data management practices and business data models,
- Maximising the value of data for all parties involved, including island countries, distant water fishing nations, vessel owners, regional organisations, etc.

QUERY DATABASE AS A TACTICAL MANAGEMENT TOOL

CDR applications developed so far provide essential mechanisms for collecting, verifying, storing and maintaining detailed information on vessels, their fishing trips and catch, observer data, people and organisations, fisheries agreements and licences, violations and prosecutions, etc. These mechanisms are used daily at the operational level of the FFA's business.

As part of individual CDR applications, numerous standard queries and reports are also included for use in control and management functions, particularly on the tactical level. To further assist managers in getting required information, a separate application was introduced, called the 'Query Database'.

The Query Database was envisaged as a tool that would quickly deliver summary information based on various parameters, which is what analysts and middle management are primarily concerned with. As a separate application, with a simple user interface, the Query Database represents a centralised and extensible collection of selected queries, thus eliminating the need to access the detailed level of data.

At this stage however, the Query Database is only partially implemented and the recommendation is to finalise the development of this potentially very useful tool.

FFA BUSINESS STRATEGY MANAGEMENT AND EIS

Forum Fisheries Agency's business operations are clearly directed by its mission statement and aimed at achieving strategic objectives. At the same time, FFA is part of a dynamic world of constant changes, global businesses and global communications. This means that at certain intervals, the mission statement needs to be revisited and key objectives re-affirmed, amended or modified as appropriate.

At the highest level of management (and this includes data management too), the process of *business strategy planning* will focus on *defining, sharing and achieving business objectives.* This involves specific functions such as:

- Defining organisation's mission and business objectives on various levels of the organisation's hierarchy,
- Setting up and monitoring strategic projects, ie. the actions required to achieve objectives,
- Defining, monitoring and analysing key performance indicators used to measure the success in achieving objectives,
- Reviewing business processes to determine if and how they can be improved, etc.

These business requirements can be supported by specific software tools for Strategy Planning and Management and Executive Information Systems (EIS).

It is recommended to evaluate and possibly implement such tools at the strategic management level of FFA.

References

ABOUT THE CDR DOCUMENTATION SET

The FFA CDR Documentation Set is a collection of nine documents (volumes) written with the objective to give a complete and detailed description of the FFA Corporate Data Resource (CDR). This Documentation Set is the principal reference material for both the users of CDR applications, and the IT professionals involved in the support, maintenance and further development of CDR. The nine comprising volumes are:

- *Volume I* - CDR History, Current Status and Future Potential
- *Volume II* - Systems Administration Manual
- *Volume III* - Common User Interface for CDR Applications
- *Volume IV* - Vessel Activity and Catch System (VAC)
- *Volume V* - Regional Register System (REG)
- *Volume VI* - People and Organisations Database System (POD)
- *Volume VII* - Observer Database System (OBS)
- *Volume VIII* - Fisheries Agreements and Licences System (FAL)
- *Volume IX* - Violations and Prosecutions System (VAP)

Forum Fisheries Agency

Presentation to
ITPacNet99, FFA, Honiara, 2-4 June 1999

Andrew Richards
FFA Manager Monitoring, Control and Surveillance

Introducing

the Forum Fisheries Agency

Member Country

Vessel Monitoring System

The Vessel Monitoring System

- The VMS automatically monitors the location of vessels - then analyses and presents this information to FFA and Member Country operators
- The FFA VMS is capable of handling position reports of up to 2000 vessels

The FFA VMS

- Each Member Country can tailor aspects of the FFA VMS to reflect their requirements
  - » e.g. how frequently it wishes to monitor vessels and which vessels it wishes to monitor
- Designed to be integrated with other fisheries management systems - e.g. vessel licencing system, the FFA Regional Register and the People and Organisations Database (POD)

Who Uses the VMS

Vessel operators or owners

- purchase and install ALC
- send position reports
- send/receive e-mail

Member Country personnel (TUNA Client systems)

- request and display vessel positions
- receive/send e-mail
- generate reports
- maintain the TUNA Client system

FFA personnel (MAKO Client systems)

- as for Member Country personnel
- maintain the MAKO Support system

Uses for the VMS

- Provide near-real-time monitoring
- Detect vessel activities to be monitored, eg:
  - » entering or leaving your EEZ
  - » travelling slowly in an EEZ for which the vessel is not licenced to fish
  - » travelling slowly in a closed area
  - » failing to return a scheduled position report
  - » dead in the water

Uses for the VMS

- Provide data for manual cross-correlation of claimed catch location, from a vessel's log, with reported vessel location at the time the catch occurred
- Provide an indication of fishing activity and targeted species by human analysis of the vessel's track pattern, location and speed

Uses for the VMS

- Provide information on **known** vessel activity allowing surveillance missions to quickly identify **unknown** vessel activity
- Provide two-way electronic mail communication between the FFA Headquarters, Member Countries and vessels

Uses for the VMS

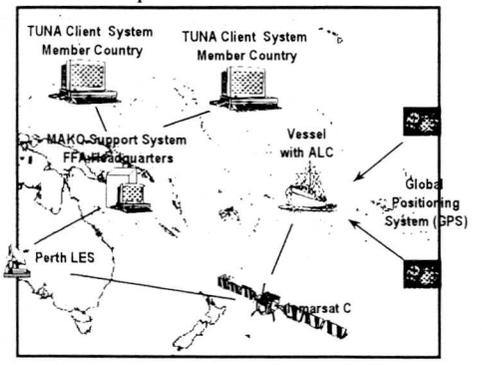
- Assist search and rescue efforts
  - » finding vessels near to a ship-in-distress
  - » if the ship-in-distress is carrying an ALC, then the last reported position may be used to identify the search area

How VMS Works

Position information is ...

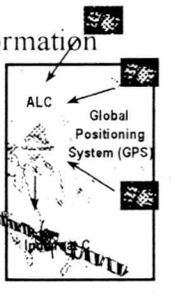
- Collected from vessels
- Transferred to the FFA Headquarters
- Processed and analysed
- Sent to Member Countries
- Presented as a map display
- Responded to as appropriate

Example VMS Scenario



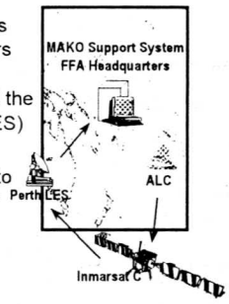
Collecting Vessel Information

- An **Automatic Location Communicator** (ALC) is installed on all vessels
- ALC uses the GPS to determine its location
- ALC automatically reports its position at preset intervals or when requested by VMS operators



Transferring Vessel Information

- Vessel position information is sent to the FFA Headquarters via the Inmarsat-C communications system and the Perth Land Earth Station (LES)
- Vessel operators, FFA and Member Countries are able to use the Inmarsat-C for other tasks, e.g. e-mail communications

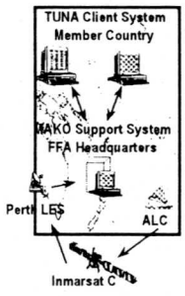


Processing and Analysing

- Vessel position reports are automatically processed and analysed by the MAKO Support system at FFA Headquarters
- Rules are used by the Decision Engine to analyse each position report
- VMS data is stored in an Oracle database at FFA Headquarters

Communicating Information

- The Decision Engine sends alert messages as required
- Member Countries request vessel position and other information as required
- Information is stored locally



Communication Methods

- Internet
- IDD {telephone}
- Satcom-C (-ALC comms, telex, fax, GMDSS comms, access to FleetNet, currently not configured for VMS download)
- Data security is achieved using an encryption program - called **SmartCrypt** - which encodes and decodes data

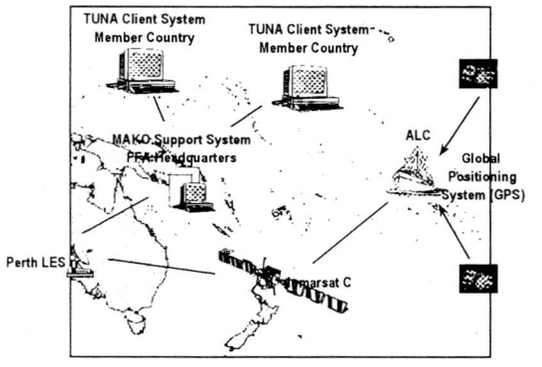
Presenting VMS Information

- Track Explorer is used to display vessel positions
- Users can request vessel positions - using **queries**
- Vessel position sightings can be entered manually

Responding to Position Reports

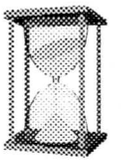
- Alert messages inform VMS users about vessel activities
- Users can respond to alerts in a variety of ways, e.g.:
  - immediate position report (poll)
  - change polling rate
  - send an e-mail
  - deploy surveillance craft

FFA VMS



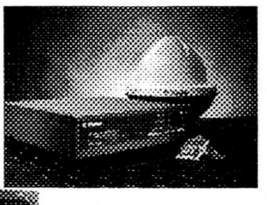
Future Uses of the FFA VMS

- Collection and processing of catch reports (and other reports) from vessels
- Tracking of non-fisheries related vessels such as hazardous chemical and oil tankers
- Detect likely trans-shipment of catch at sea by analysis of possible rendezvous with other vessels



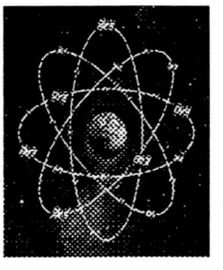
Examples of Inmarsat-C Automatic Location Communicators

- 'Hands off' automatic position reports
- Can be used for text messaging
- can generate distress messages



Key Purpose of VMS

- The key purpose of the VMS is to provide support to existing surveillance and monitoring programs by integrating position reports with air & sea surveillance patrol schedules to target potentially suspicious behaviour and eliminate search time



VMS Progression

- 1993: issue of VMS first raised at MCS
- 1995 business feasibility study undertaken
- 1995: funding became available from Australian Dept of Defence
- in 1996: tender was released
- 1996 (Nov) contract signed with Aspect Computing
  - » Subcontractor : Absolute Communications NZ

VMS progression (continued)

- 1996 (Nov) contract signed with Aspect Computing
  - » Subcontractor : Absolute Communications NZ

VMS Progression (continued)

- 1996 (Nov) - 1997 (Oct)
  - » Confidence Trial/ Technical Trial
- 1998 Jan - Nov
  - » software revisions and testing
  - » acceptance testing
  - » MC upgrades and revision
- 17 March 1999 - Project sign-off
- 1 April 1999 Admin. arrangements in place
  - » VMS Register, help desk etc

Questions ???

SOPAC Wide Area Geographic Information System (WAGIS)

Strategic White Paper

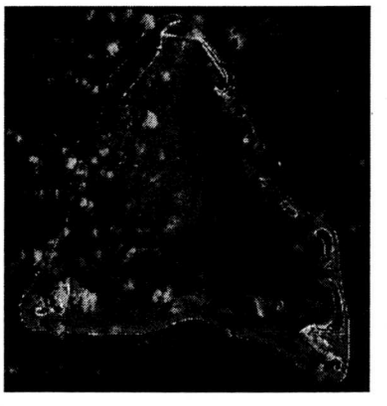
Franck Martin, Network and Database Developer.

Project Description

SOPAC (South Pacific Applied Geoscience Commission) is a regional organisation mandated by Pacific Island Countries (PICs) to study and monitor the geology of the Pacific. One of SOPAC work program components is the storage and manipulation of digital data.

SOPAC has acquired during the years various sets of data: Cruise Data, Marine Data and Coastal Data. SOPAC has quite early adopted the MapInfo suite of software for its requirement in GIS (Geographic Information System) or digital mapping.

SOPAC has converted some of its dataset to MapInfo, and has also produced a number of MapInfo tables. This digital mapping data is managed by various SOPAC Units, and has not been globally homogenised.



This project aims to provide an organisational method to SOPAC to store digital data from MapInfo. It will provide a MapInfo Interface to select and retrieve tables of data from a common location. A metadata database will be created to store information on each table such as: Author, Location, Date, Accuracy, Revision, Notes,.. This metadata will be stored on a Microsoft SQL server database. A MapInfo Interface will be developed in MapBasic to allow the user to retrieve seamlessly the relevant table for his work.

Agents will be developed to exchange metadata information between sites. These agents will be made available to other organisations.

Moreover, the SQL server will include snapshots of SOPAC Aerial Pictures Catalogue, to allow users to pre-select images. When an image is rectified (geographically referenced and corrected), it will then be added to the list of available MapInfo tables.

This information will also be provided through a web interface, which will allow non-MapInfo users and users form the Pacific to display in a short summary the information available in SOPAC. The display will be textual as well as graphic in a small picture map.

Due to the size of the data, it is recommended to acquire a proper storage system. An aerial picture is about 50MB alone and SOPAC holds about 1000 Images. Digital maps already produced by SOPAC account for more than 5GB of space. A Server with a capacity of 36GB secure storage will be installed to cater for this high volume storage.

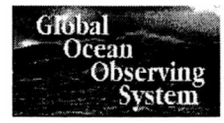
Benefits

It will strengthen SOPAC position as Regional Data Centre.

SOPAC produces a CD-ROM every year containing regional geographic information. This CD will be extended to a country by country geographic data set leading to a higher level of accuracy.

The online information inside SOPAC will allow the harmonisation of information from various SOPAC Units and sectors. Data from Sewage, Electricity, Water, Phone, Roads, Geology, Land, Hazards will be consistent in location and accuracy.

SOPAC projects will benefit from a database of information available in SOPAC, and cost will be reduced from the original survey work. The project results will contribute back to the digital mapping database.



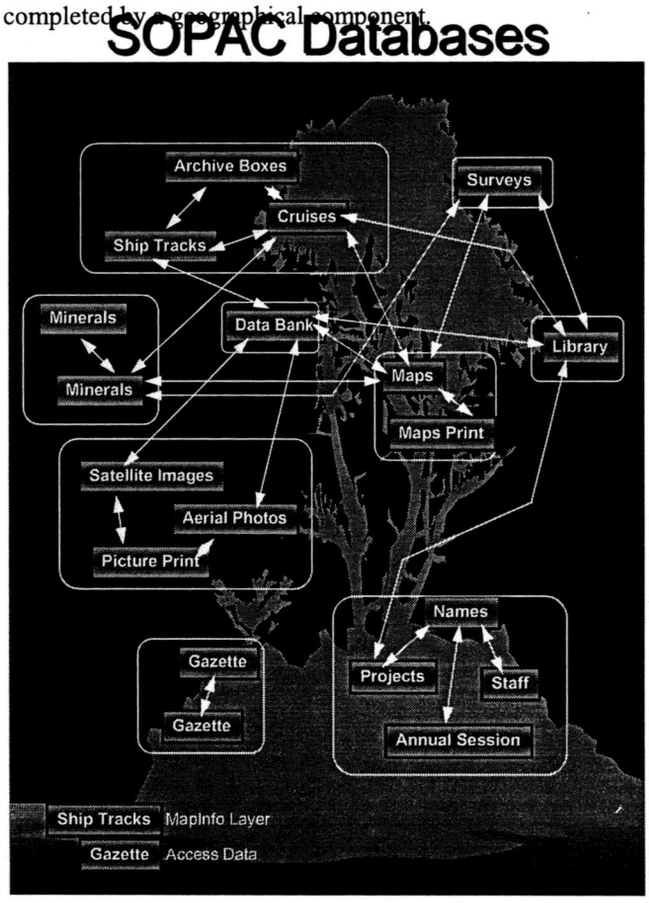
Internet users will be able to consult SOPAC datasets world-wide. It will create a synergy of projects within SOPAC, and attract more co-operation projects from various countries. SOPAC Member countries will also be able to consult the digital maps held in SOPAC and the results of SOPAC work program tasks in a shorter time, enabling these countries to drive more closely the future SOPAC work program.

Other organisations will be able to contribute to the metadata catalogue as well as mirror the whole catalogue.

Components

Databases

Based on the activities of research vessels for petroleum exploration, a database of Research Vessels exploration was established as early as 1980. This database was then strengthened by other data sets that were completed by a geographical component.

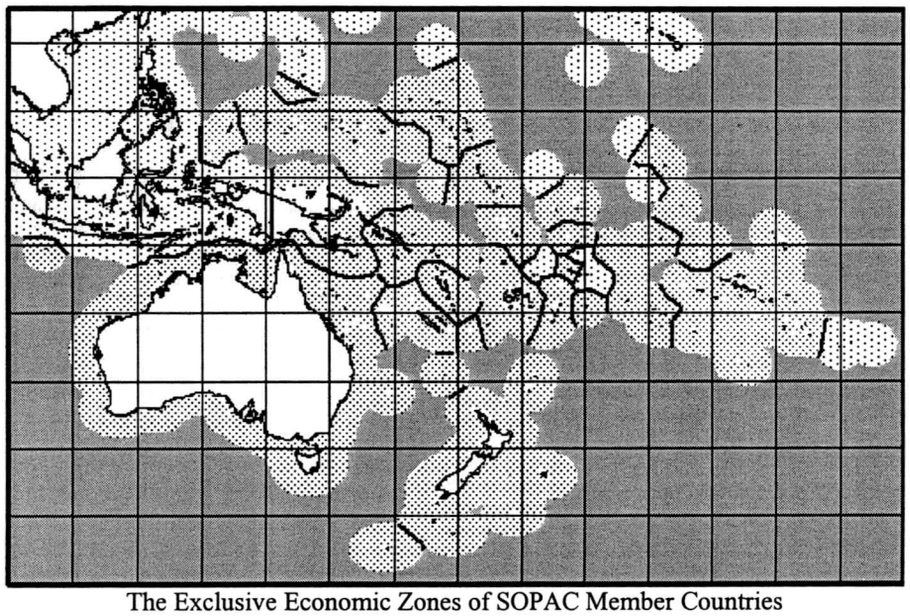


Databases Diagram

Digital Maps

Location

The data included here has been compiled for the following area.

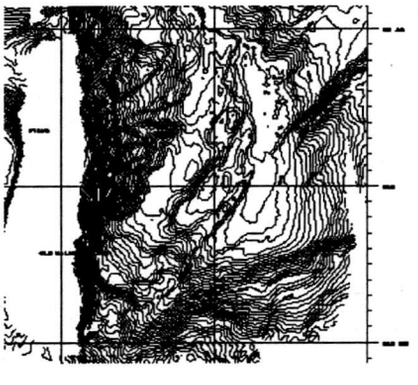


The Exclusive Economic Zones of SOPAC Member Countries

Contents

Here are the different categories of map produced in SOPAC. These maps are part of the release of the CD-ROM SOPAC Data, distributed to all SOPAC member countries.

- **Bathy**: Bathymetric data
- **Coasts**: Coastlines
- **Cruises**: Shiptracks of research cruises
- **Hazards**: Hazard data Worldwide
- **EEZ**: Exclusive Economic Zones boundaries
- **Geol**: Geology features
- **Gravity**: Gravity data in a raster format
- **MapBasic**: An addon to MapInfo to print Maps
- **Names**: Names of locations
- **Nodules**: Poly-Metallic Nodules
- **Spot**: Spot image availability
- **Topo**: Topographic data of the land and seabed in a raster format.

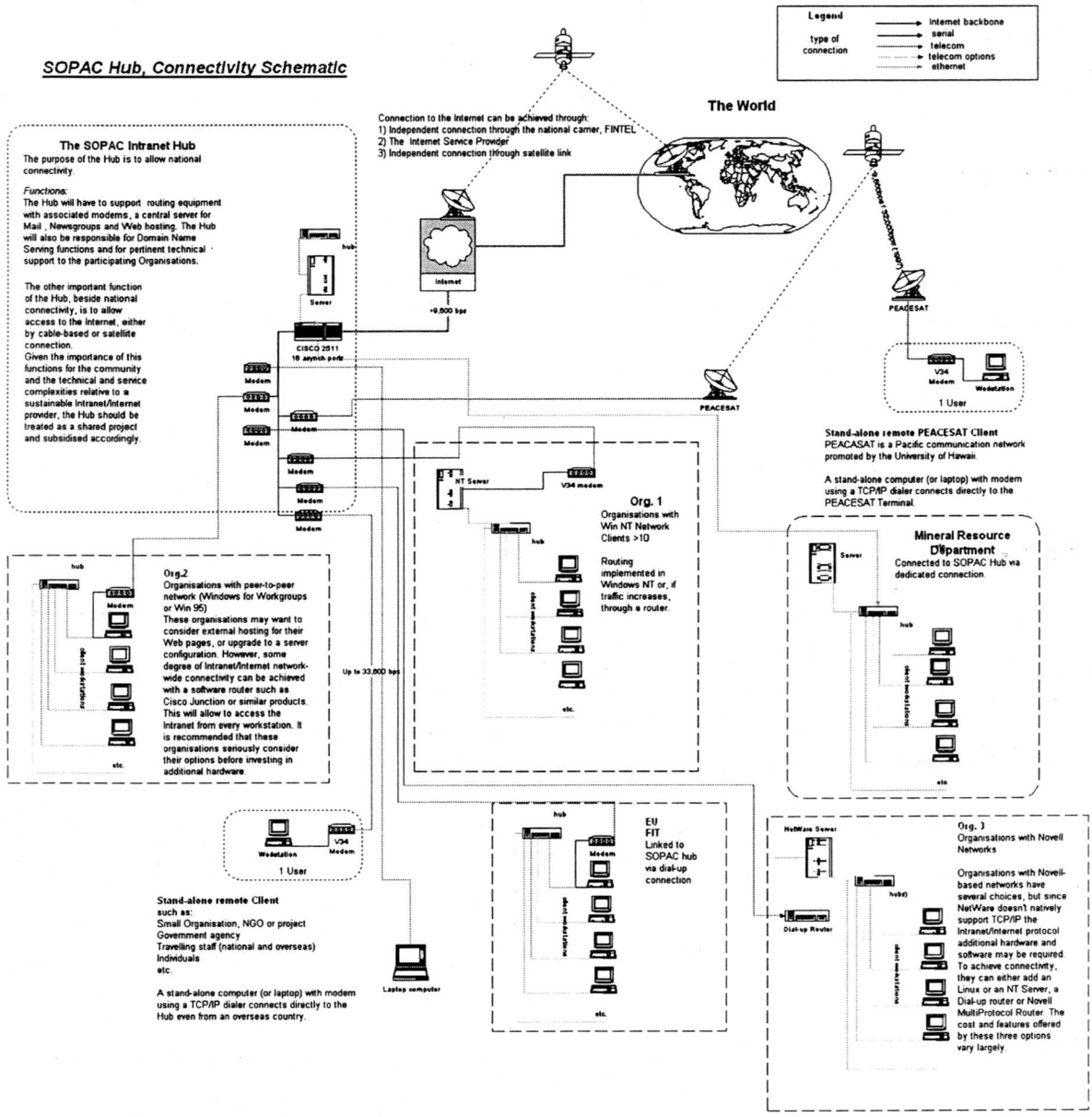


SOPAC also store digital map from various countries. It acts as an information repository for the benefit of Pacific Nations.

Network

SOPAC bases its expertise from the creation of the Fiji Internet/Intranet Group. It has enhanced SOPAC skills in Wide Area Network (WAN) technologies. Early test with the PEACESAT satellite system as proven the capability of SOPAC to install and manage satellite based links.

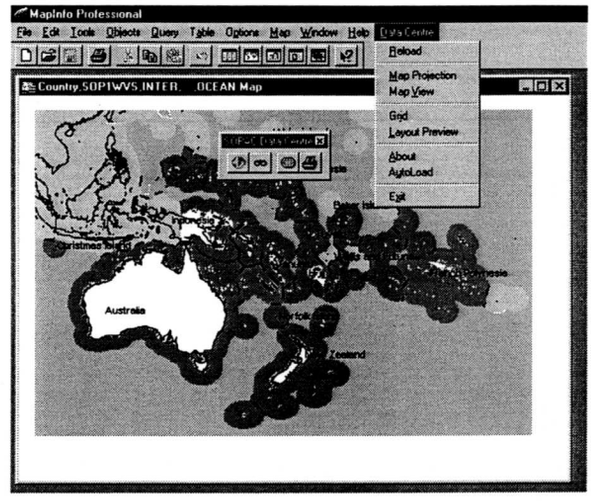
This experience has also strengthened the co-operation within South Pacific Organisations Co-ordinating Committee (SPOCC) agencies.



Interface

MapInfo Interface

The main interface to WAGIS will be through MapInfo. The MapInfo SOPAC tool will be enhanced to contain a map loader. The user won't be presented with a set of files but a categorised description of available layers.



For the moment the MapInfo SOPAC tools allow the automatic creation of maps within MapInfo. This tool is available free of charge from our web server.

SQL Engine

Microsoft SQL server will provide the link between MapInfo and the MapInfo tables. It will use the metadata stored in the MapInfo table files to automatically index and populate its metadata catalogue. It will also provide a way of releasing MapInfo tables for modifications.

The engine will take care of confidential information and in particular, the release of new scientific data collected within SOPAC EEZ member countries.

The SQL Engine will process a catalogue of digital maps and distribute it via e-mail to SOPAC staff and other interested parties on a regular basis. The SQL engine will also send announcement of new digital sets available in SOPAC after a digital map has been certified for release. Some of this data will be copied and compiled as part of SOPAC Data CD-ROM.

Web Interface

Finally, the map data will be available through SOPAC web site. The user will be offered the possibility to compose its own maps based on the data available in SOPAC. This interface will be useful for external users as well as for SOPAC own staff.

Through Secure Server Layer (SSL) protocols and certificates, member country representatives will access confidential data pertaining to their area.

Most of the non-geographical data stored in SOPAC is already available on SOPAC web site. Users can also subscribe to an Internet Explorer Active Channel to receive scheduled update of database information.

SOPAC Web Site

www.sopac.org.fj

The toolbar will be present on all pages and will help you navigate between the Web Zones:

SOPAC will bring you back to the home page www.sopac.org.fj. The home page presents the latest additions to the site. Check this page often.

SECRETARIAT lists all the activities related to the operation of the SOPAC secretariat. The different units pages are located here as well as the special projects pages. A brief description of SOPAC and links to other Regional organisations are present here.

MEMBERS lists information pertaining to member countries and provides a host for some of our member country geological home pages.

DATA gives access to all data collected and stored at SOPAC. This data includes:

- Research Vessels in the region
- Reports published by SOPAC
- Task Profiles
- Staff list
- Aerial Photography
- Press Releases
- Data Bank
- And many more...

FIG The Fiji Internet Group created in 1995 to give SOPAC and other organisations access to the Internet has its home page here.

SEARCH Type any word or sentence here and the search engine will look for matches in our pages or reports.

SOPAC member countries include:
Australia | Cook Islands | Federated States of Micronesia | Fiji Islands | French Polynesia (Associate) | Guam | Kiribati | Marshall Islands | New Caledonia (Associate)| Nauru | New Zealand | Niue | Papua New Guinea | Samoa | Solomon Islands | Tonga | Tuvalu | Vanuatu

APPENDIX 22 - SPC IT PLAN

Table of Contents

Introduction

The Secretariat of the Pacific Community is committed to the efficient use of Information Technology and Telecommunications to improve the delivery of services to the region and increase the effectiveness of its internal operations.

The Secretariat's Corporate Plan 1999 – 2003 identifies as key objectives to "promote the use of information technology and telecommunications (IT&T) to enhance information dissemination" and to "provide expert advice on appropriate IT&T options for the region".

This document provides strategies for appropriate use of Information Technology and Communications services over the next five years to ensure SPC remains at the forefront of IT adoption within the region by continuing to use practical technologies to advance programme delivery to island states and territories.

Information Technology & Communication Services at SPC today

Information Technology and Communications Unit

The Secretariat of the Pacific Community established its "Information Technology and Communications Unit" (IT&C) in April 1998 and gave it responsibility for the provision of IT&C services for the entire Secretariat. Through the unit, the Secretariat is now able to develop its systems in a co-ordinated fashion, avoiding compatibility problems and ensuring high quality services to all sections of the organisation.

Functions

Communications

The IT&C Unit supports the essential communication systems of the Secretariat both internal (LAN) and external. This includes pro-actively developing new systems (fax, email) and refining existing systems as technological improvements make that possible.

Strategic management support.

Information is a corporate resource and effective utilisation of such a resource is critical at the senior management level. The IT&C unit provides expert advice to the executive as to the directions of IT regionally and globally and where the Secretariat can direct resources to achieve maximum benefits, for the headquarters operations and within member countries.

Systems development

The IT&C unit develops information systems in support of the corporate objectives, for program and administrative use. This ensures that they are appropriate, integrated and easy to maintain, complying with the Secretariat's development standards.

Standard setting and Purchasing

The IT&C unit has a key role in specifying and purchasing IT hardware and software supplies to ensure that these remain consistent with the Secretariat's standardised platforms. The highly

specialised nature of the purchases makes it essential that deliveries are checked and approved by IT staff.

Training

The IT&C unit provides training appropriate to the needs of SPC staff and to the systems environment of the organisation. The twin objectives of training are to keep staff abreast of the opportunities that IT technologies offer for the improvement of service delivery and to ensure that the Secretariat's significant investments in IT are fully utilised.

Maintenance

Maintenance and repair of the hardware and software used to support the Secretariats information systems is a critical function of the IT&C unit. Associated with this is the necessity to implement appropriate disaster recovery procedures and to protect the integrity of the Secretariats critical data resources.

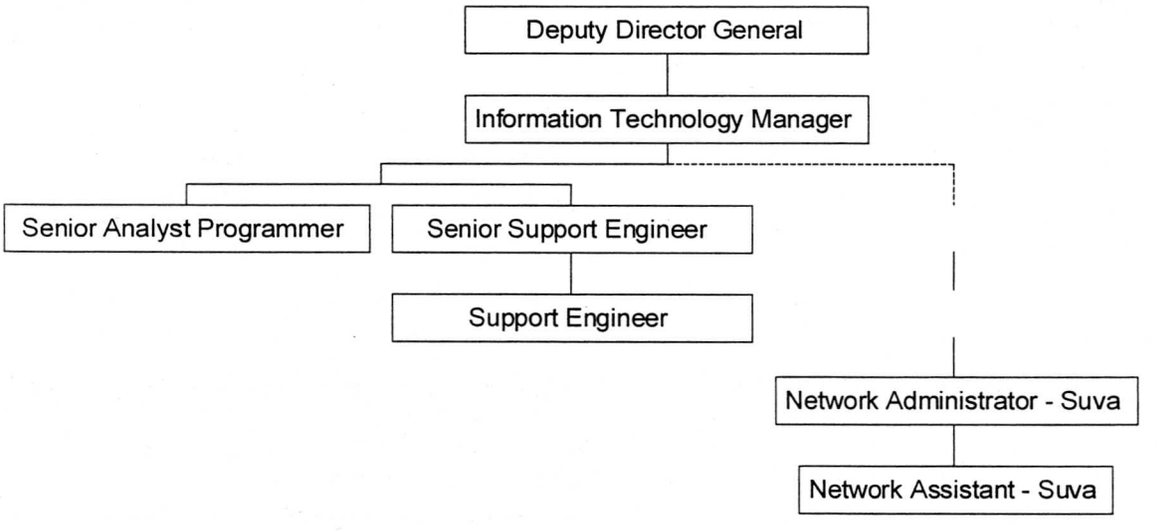
Conference support

The provision and maintenance of the conference translation and audio-visual services has been traditionally the responsibility of the Conference Technician, a position recently incorporated into the Information technology and communications unit, a task that has been enlarged with the provision of professional audio-visual presentation facilities in the Noumea conference centre.

Technical Assistance to Member Countries

Within the context of limited resources, the IT Unit has been able to respond to requests from member countries for technical assistance, received through the other technical programmes of the Secretariat. To date these requests have been dealt with on an *ad hoc* basis. This function is expected to continue and may be strengthened if external funding can be identified for a *Regional IT Initiative* which received overwhelming member country endorsement at CRGA 1998.

Structure



Until April 1998 IT service provision was addressed in an *ad hoc* fashion by the various programmes. This led to a fragmented approach, with incompatibilities arising due to uncoordinated activities, and

resulted in programmes that made budgetary allocations to IT having high quality support whilst other areas were poorly serviced.

The IT&C Unit at SPC currently consists of 6 staff, two of whom are based in the Suva office. The Network Assistant, Suva, is a training position, recently created as an ad hoc item from the 1999 budget. However, in light of its very low budgetary implication (4,000 CFP units) and the continuing need to provide additional technical support to the Suva office, it is expected that this position should continue.

Computer and Communications Committee

Prior to the creation of the IT&C unit this committee, which consists of IT staff and representatives from the executive and programmes, provided co-ordination between the IT activities in taking place in the various areas of the Secretariat. Its current function is to promote dialogue between the IT staff and SPC staff to ensure that the IT unit can respond to staff needs and staff are aware of potential directions in IT and how they can be used to facilitate their professional activities.

Due to the logistics of inter-office meetings, this committee currently contains only Noumea representatives but the minutes are available to all staff.

Financial Resources

1998 was the first year in which a consolidated budget for the IT&C unit was prepared:

			1998	1999
Noumea				
	Salaries and Allowances			
		Information Technology Manager	58,300	68,100
		Computer Services Engineer	58,800	65,700
		Computer Specialist	53,600	58,400
		Computer Training & Development Assistant	47,800	47,800
	Total Salaries		**218,500**	**240,000**
	Maintenance			
		Duty travel	6,000	14,000
		Network Maintenance	25,200	66,500
		Indexing Software	20,000	0
		Computer Training	2,500	0
	Total Maintenance		**53,700**	**80,500**
Suva				
	Salaries and Allowances			
		Network Administrator	18,900	19,500
		Network Attachment	0	4,098
	Total Salaries		**18,900**	**23,598**
	Maintenance			
		Duty Travel	3,000	1,500
		Network Maintenance	4,000	4,000
		Server Purchase	14,000	0
	Total Maintenance		**21,000**	**5,500**
	Total IT& C (Noumea and Suva)		**258,400**	**269,098**

Publications

The Publications section has worked extensively with the IT&C unit to develop electronic publishing to complement its more traditional hard copy methods. Publications staff provide essential design and editing skills which build upon the technical services provided by IT&C to ensure that the SPC web site remains one of the key Pacific information resource tools on the Internet.

Registry

The Registry section has responsibility for the operation and maintenance of the PABX and manual fax systems. The PABX is maintained and configured under a service contract with ERS.

In practise, automation of the fax systems, coupled with the need to integrate the various communications systems with the accounting software has meant that the IT&C unit works closely with Registry to ensure these systems continue to operate.

Building maintenance

The building maintenance section is currently responsible for:

- **Fire Alarm system**, maintained under contract by **ERS**
- **Security system**, maintained under contract by **Espace Bureatique.**

Support contracts

Support contracts have been purchased where specialist hardware or software is involved that provides a mission critical service. These support contracts provide for software upgrades and helpdesk services, ensuring that systems can be re-established in the shortest possible time.

- **Cisco Systems** Australia, for the Internet router unit.
- **RightFAXNT** USA, for the Fax server software and card
- **Lasata**, Australia, for the financial systems (SunSystems, Vision)
- **Microsoft, Australia.** Subscription to the TechNet and MSDN programmes provide regular updates and technical fixes to Microsoft products.
- **Norman Defence Systems, Netherlands,** updates and support for anti-virus software.
- **Verisign, USA.** Secure server ID provision to allow secure access to SPC web sites.
- **Fulcrum, Australia.** Support and upgrades for the integrated indexing system.

Contracts maintained by the Oceanic Fisheries programme, with HP Australia and Oracle systems have recently been allowed to lapse due to the reduced importance of these systems to the OFP.

Systems

Desktop environment

A recent comprehensive upgrade policy in Noumea has endeavoured to ensure that all staff, regardless of organisational unit or grade, have access to appropriate computer support tools to ensure their maximum effectiveness. This consists of the following minimum provision to each desktop:

- Pentium PC with at least 32MB RAM (or Macintosh equivalent)
- Minimum 1GB hard disk
- 15 inch colour monitor, Minimum 1024x768 resolution
- Windows95 SR1 or Windows NT4 & SP3

Workstation type	Noumea	Suva	Total
Windows PC	148	74	222
Macintosh	10	7	17
Total	**158**	**81**	**239**

Standard Software as follows:

- Microsoft Office 97 (SR1) - contains Word97, Excel97, Access97, PowerPoint97
- Microsoft Outlook98
- Norman NVC 4.63/ThunderByte Anti-Virus v8.09
- Vision for SunSystems

A similar upgrade programme needs to be undertaken at the earliest possible opportunity in Suva. Given the rapidly falling price of RAM memory and the productivity improvements that can result from the provision of a responsive workstation, this will be a relatively cheap exercise that will yield dividends in reduced maintenance, improved staff morale and institutional standardisation.

Networks

All officers are provided with common networking, printing and communications services by a modern Local Area Network (LAN). All of the buildings in the Noumea complex are connected via Fibre Optic at 10 Mbits. Connections to individual servers and workstations are made using UTP copper cable.

In Suva, buildings are linked using 10Base2 coaxial cable, with UTP making the connection between the desktop and the nearest hub.

The following network infrastructure is currently installed:

Server	Noumea	Suva	Total
Windows NT	13	2	15
Unix	3	1	4
Total	**16**	**3**	**19**
Network Hardware			
Hub	15	11	26
Network Printer	17	8	25
Router	1	1	2
Modem	4	3	7
UPS	2	1	3
Server Monitor	2	1	3

The network servers provide several mission critical workflow services, which are available to all staff:

- Microsoft Exchange server 5.5 SP1

Provides integrated email and messaging services, including shared folders and Internet mail connectivity

- Microsoft SQL Server 6.5

Provides rear-end database services in support of the financial software, fax systems and increasingly the fisheries databases as Oracle and HP-UX are phased out.

- SunSystems 4.2.2 Accounting software

The basis of the financial system, providing for greater control over financial movements and finer reporting than was possible with the previous system.

- Microsoft SMS Server

Monitors the hardware and software on the network, creating an automated inventory and simplifying the rollout and upgrade of software products.

- RightFAXNT 6.0

Provides LAN based fax services, allowing officers to send faxes automatically from any networked PC whilst ensuring that audit and recording requirements are complied with.

Intranet (Internal network)

The Noumea office benefits from a comprehensive Intranet service hosted on one of its servers, which provides staff with access to news, support services, network help and general information. The Intranet has proven a very effective method of dispersing instructional information to staff and its informal style encourages staff to explore and make use of new services. Very little use has been made of the Intranet as a method of disseminating information to staff in the Suva office. As soon as the communication limitations between the two sites are resolved the corporate intranet will become an essential organisational information resource for all staff, regardless of their location.

Internet (external access)

Since 1996 the Noumea office has been connected to the Internet through a leased line from OPT. The link is currently of 28.8 kbps capacity and OPT has been unable to provide a quotation for any speed increase. There are three major components involved in the provision of Internet services:

- Cisco 2511 access server - manages the external connection to the Internet and dialup access to the SPC network. Provides fundamental security
- Linux firewall - separates the internal LAN from the external Internet, ensuring external access to proprietary information is denied and regulating the provision of services to ensure the limited bandwidth is used to best effect.
- External web server (www.spc.org.nc) - provides information on SPC's activities to the outside world.

In Suva internet connectivity has been provided through participation in the Fiji Internet Group (FIGNet), a consortium of non-profit organisations who have pooled resources to share a leased line from the only licensed Internet provider, Fiji Telecom.

The extremely high prices have severely restricted the utility of this service, with the Suva office having access to a one tenth share of a 19.kbps circuit, giving them an effective bandwidth of 1.92kbps. Although this connectivity has proven useful for limited inter-office email, the low speed of the link has effectively denied Suva staff access to the information services enjoyed in Noumea.

Services

Web publishing

Web publishing is increasingly used a primary method of publication, particularly in the fisheries areas. Significant savings can be realised over conventional methods.

Web access

A substantial proportion of Noumea based staff make daily use of the SPC Internet connection in support of their tasks. This is primarily by the use of web access to research information to remain abreast with developments in their fields.

Mail access

All staff have access to world-wide electronic mail, the use of which is substantially more cost-effective than fax or telephone calls, particularly when the ability to work collaboratively is factored in. As email is the Internet service with the lowest hardware costs to implement, this has proven effective in improving connectivity within the region even when other services are not available.

Achievements to date

Communication cost reductions

Electronic mail

Communications costs have been substantially reduced by the widespread use of email and automated fax systems.

Due to the fixed cost nature of the Secretariat's Internet connection, email messages incur no incremental cost. Actual savings are difficult to quantify as the medium encourages correspondence that would not take place via a different medium (increased communication for professional purposes and, inevitably, some private use of the system). Even if one guesses that only 50 per cent of the email

correspondence would have been made by fax or telephone, SPC would have had to pay an additional 100,000 CFP units in communication costs for the Noumea office alone.

Statistics related to the Secretariat's use of email can be found in Appendix 4:.

Automated fax

Facsimile transmissions costs have been substantially reduced by the introduction of an automated fax system providing:

- automated scheduling for 'cheap rate' periods
- reduced transmission times by sending 'short' pages
- Reduced need for manual operation of fax machines, saving significant staff time.

Statistics related to the Secretariats use of the automated fax system can be found in Appendix 5:

Efficiency improvements

Impact on support positions

Introduction of workflow applications, such as electronic mail, word-processing and spreadsheets have made unprecedented changes to the working environment of the Secretariat:

The majority of professional staff now type their own reports and project documents without the need for secretarial services. For documents that require expert input, this considerably reduces the number of drafts and amount of production time required.

As a consequence, secretarial positions have now been recast as 'Project Assistants' performing a wider range of tasks, relieving professional staff of many administrative matters and even taking on some professional tasks and increasing the job satisfaction for those in PA positions.

Some sections now operate without any or with fewer support staff which would have been impossible without the Intranet. The annual cost for a B3 support position is around CFP units 37,000.

Introduction of email as primary means of communication has reduced paper flow and the requirement to distribute it. While SPC is not a paperless office, most internal communication takes place electronically. While the organisation may not have fully exploited these efficiency gains in terms of staffing requirements, a conservative estimate would be one full-time support position (annual costs: CFP units 30,000).

Improved projection of corporate image

Information Technology improvements have contributed significantly to raising the profile of the organisation, within the region and on a global scale:

The organisation has made extensive of its web site, to promote its aims and objectives and to provide instant access to pertinent information, regardless of location. Several programmes have enthusiastically embraced use of the SPC Web site. Statistics indicating the access to the site can be reviewed in Appendix 2:.

Recent acquisition of multi-media projection facilities for the conference centre allows the production of high-quality professional presentations to large audiences.

The SPC web server is now used a supplementary method of advertising staff vacancies and many applications have resulted from candidates who first discovered the vacancy using the World Wide Web.

The use of electronic publication capabilities has reduced both the costs and delays associated with production of the Secretariats numerous publications. The fisheries programmes have made particular use of this, publishing up to date statistical information on the SPC web site far in advance of printed paper materials.

Planning Context and Strategies

Structure and Functions

Current structure and functions have generally proven to be quite effective in meetings the needs of the organisation.

The resource requirement for support, training and maintenance is in direct relationship to the number and skill level of the network users. The recommendation of the SPOCC ITPacNet group over the last three years has been for organisations to base their support needs upon a user to staff ratio of 30:1. Current staff ratios are 30:1 in Noumea and 45:1 in Suva, although the latter ratio will fall with the end of some large projects. Across both offices the ratio is 38:1.

A user to IT support staff ratio of 30:1 to 35:1 will be targeted for the Noumea and Suva offices.

Whilst absolute ratios are not critical they provide a tool for decision-makers to gauge additional support requirements that would result from a future substantial change in staff members, by the addition of new programmes or projects.

Resources permitting, an additional position at the support (Band 3) level will be established in Noumea to relieve professional staff of lower level tasks. Alternatively, this could be addressed by reallocation of existing support staff resources.

Such tasks include the ordering and verifying of purchases and deliveries which is currently done by professional staff. The cost of an additional support position at B3 level is around CFP units 37,000 per year (from the core budget). This could be achieved within existing resources if a staff member were transferred from another section.

The Information Technology and Communications Unit will maintain high quality service can be maintained with specific attention to:

- Ensuring that equivalent support services are provided to the Suva and Noumea offices.
- Ensuring that staff have access to reliable workflow support services
- Minimising down time for network equipment
- Ensuring that solutions provided remain mainstream, cost-effective and modern whilst avoiding cutting-edge or unproven technologies.
- Provisioning for replacement of equipment with an effective life span of three years.
- Ensuring that SPC is in a position to offer advice, support and be a role model for the effective use of information technology within the region.

The Information Technology and Communications Unit is committed to the provision of high quality service to the organisation as a whole.

Support to Suva Operations

Historically, the level of technical support provided in the IT area to the Suva office has been substantially lower than that provided in Noumea. The creation of an integrated organisational IT unit has allowed substantial progress to made to addressing this disparity, notably by the following activities:

- Provision of IT support staff based in the Suva office.
- Regular and increasing support visits from Noumea based support staff (1996;0-1997;1-1998;5-1999 (Q1);3)
- Noumea attachment for Suva based IT staff
- Provision of communal software tools from 'Noumea' IT funds, in an effort to priovde the same tools to staff in both offices.
- Development of the ComET project to provide a dedicated inter-office link

Despite these efforts, it is evident that Suva still lags behind Noumea in the level of service provision. The increase in staffing levels, coupled with the logistical difficulties encountered at the Suva office due to the dispersion of offices, mean that consideration should be given to the provision of a professional level (P04) analyst/programmer position in the Suva office.

It is important to distinguish between the need for development and support staff. All systems development takes place in Noumea, and it envisaged that the dramatic communication improvements that will result from the successful implementation of the ComET project will allow Noumea professional analysts to provide high level development assistance to the Suva programmes. However, implementation of the ComET project may require SPC to provide connectivity to other organisations and groups, such as FIGNet. Whilst the benefits of improved connectivity to the Secretariat are undeniable, this will entail a significantly highly level of technical expertise in the Suva office.

To address the increased support need in the Suva office, and the necessity of supporting the communications infrastructure of the ComET project, an analyst/programmer position at grade P04 will be created.

This position should be established on a two-year contract basis. The needs of Suva will need to be reassessed when the new building is completed (currently scheduled for 2001) and the option of sharing IT&C support services between SPC, SOPAC and TCSP, and possibly others, considered.

Difficulties in providing comparable service for the Noumea and Suva offices due to separate budgetary resources for the provision of communal hardware and software has often resulted in advances being made in Noumea that could not immediately be replicated in Suva. A common network maintenance budget would allow systems improvements to be planned for both locations and cost-benefit decisions be made based on the effects on the entire organisation.

To permit equity of service provision across both SPC offices, a consolidated budget submission should be prepared.

Staff expectations

With the introduction of network services the expectations of all professional staff have expanded. This situation is not unique to SPC. At the recent TeleHealth conference a delegate reported recent experience in attracting a medical worker to accept a job in Tokelau, whose only requirement was that they must be provided with a working email connection.

In the SPC context, all professional staff expect the following services provision:

- A modern PC per staff member, capable of operating current standard software packages (such as MS Office).
- Unrestricted Internet mail access
- Access to information services (world wide web)
- Network services such as printing, backup and file sharing
- Helpdesk and support services
- Training in the use of services

Staff recruitment would become much more difficult without the provision of these services and the implications of these expectations are manifold and are reflected in the strategies of this plan under other headings. In summary however, they clearly limit the organisation's range of options in the area of IT&C.

Hardware

Personal computer equipment has a short operational life span. The cost of support far exceeds the cost of equipment in most corporate environments, making older machines increasingly difficult to keep operational and three years has been globally adopted as the usable life of a personal computer. As long as the current PC (or Macintosh) technology remains the standard, this will not change.

The implication of this for SPC's IT planning policy is that a budget must be allocated to purchase a desktop computer for each staff member every three years.

Project funded positions will be budgeted with the provision of a replacement PC every three years.

Resources permitting, provision will be made for replacement of a third of PC's for core funded positions annually.

Staff workstations are currently being replaced on an *ad hoc* basis. Funding for these replacements or upgrades is identified on a one-off basis from many different sources according to the section or program involved.

To give an idea of the scale of investment of resources required, a 3-year replacement program requires annual expenditure of about CFP units 290,000. The core budget would have to carry about CFP units 125,000, with the remainder to be borne by project funds.

The Noumea office has recently undertaken a substantial upgrade program, with the consequence that the majority of staff are provided with up to date equipment. A similar upgrade program needs to be undertaken in Suva, and provision made to carry this forward on a rolling basis.

Communal infrastructure, such as servers, routers, hubs and modems are also subject to similar life-span limitations.

Budget provision will be made to replace these units at the end of their operational life. Funds will be provided through either a central allocation or a network connectivity charge on each workstation.

The costs of replacement are estimated at 190,400 CFP units. Assuming a three-year operational life, this requires an annual replacement allocation of 62,000 CFP units.

These could be budgeted for by either a central allocation or a network charge to be levied on a per user basis. The central allocation has the advantage of being simple to implement whereas the network charge has the advantage that the total levied will be in relation to the number of users and will ensure that the budget reflects the size of the network. It would also allow the organisation to charge projects for the use the network facilities and would result in an annual charge of approximately 420 CFP units per staff member (Appendix 1:).

Software

Very little software is fully licensed at either of the SPC offices. In general the Pacific Islands have very low compliance rates with International Intellectual Property Rights (IPR) legislation. In many countries the legal status of software copying is uncertain, due to the fact that copyright controls were formulated in the early part of the century.

In Fiji software is not currently covered by copyright at all, whilst in New Caledonia the situation is unclear, France having strong IPR regulations, which the territory has yet to adopt. It is inevitable that the implementation of the WTO regulations will affect all pacific island states and territories, requiring consideration of IPR compliance issues.

Amongst the regional organisations SPC is not alone in having a licensing problem. FORSEC moved to a position of compliance a little over a year ago, but required a donor-funded project to do this. SPREP has some licensed software; however, FFA and SOPAC are in the same position as SPC. USP's software is, for the most part, licensed, however, the university benefits from substantially discounted academic pricing.

Full compliance will prove costly for SPC. The cost of fully licensed software for the SPC standard software packages (Office, Mail, Network) adds US$950 to the cost of each PC. To fully licence the Secretariat's standard software will cost in the region of US$250,000 for both offices. This does not include specialised packages used by individual programs and departments. Details of the licences required are provided in Appendix 3:

The significant expenditure required to formalise software licensing with the SPC means that it is not an issue that can be resolved immediately from normal recurrent budgets. Instead, the Secretariat is adopting a strategy that will lead to the full compliance within three years.

From January 2000, any new PC, regardless of the source of funding, must be purchased with licensed software.

The annual costs for the planning period are estimated at 32,000 CFP units per annum for three years for the core budget. For projects the total costs will be about 49,000 CFP units per annum over the same period. It should be noted that unlike computer hardware, software licences do not need to be re-purchased (unless a switch is made to a different product). Therefore software licences can be transferred to replacement workstations without additional cost after the initial purchase.

Network software needs, such as server products, will be fully licensed as soon as possible either by central provision or a user connectivity charge.

Purchase of required server software would involve an initial cost of 55,000 CFP Units.

Provision for upgrades of all software.

On average major upgrades occur at approximately 24 monthly and cost approximately 25% of the purchase price of the software; equating to a 12.5% annual update cost.

The provision of legally acquired software updates for the core funded staff for the SPC standard products will cost 12,500 CFP units per annum.

Internet/Intranet

Internet access is a fundamental requirement for professionals operating in the SPC technical programs. They must be able to communicate with their peers in the region and the world to

- **Research** and remain abreast of the latest developments in their field on a global basis
- **Participate** in collaborative projects with professionals in any part of the world

- **Publish** critical information in a cost-effective and timely manner. (A recent Tuna Fisheries Bulletin was available on the SPC web site within 30 minutes of its completion by a senior scientist, whilst a previous edition took several months to print and distribute at great cost by traditional means.)

Development, maintenance and support of Internet services remains a critical priority for the IT&C unit. Services are currently extremely limited by the low speed, high-cost links available in the Pacific.

The IT Unit has made considerable progress with the development of the Secretariat's Intranet. However, current communication restrictions between the headquarters in Noumea and the regional office in Suva have meant that the opportunities that the Intranet offers to the whole of the organisation have not been able to be fully used. Many programs are split across the two locations with staff in both offices and find extreme difficulties in effective management due to high telecommunications costs and poor availability.

The problem could be addressed by either leasing a higher capacity line from the commercial carriers or through the establishment of a private network between the two locations. The first option has been explored but costs have remained prohibitive. Recently, two donors have expressed in the concept of the ComET project which involves the installation of a dedicated a dedicated satellite antenna in each site to provide:

- One network spanning both locations.
- Near real-time mail services, without size considerations
- File transfer
- Voice circuits
- Video conferencing

Cost savings will be considerable, both the direct costs eliminated by the reduction in telephone charges, and the efficiency improvements that can be realised by using Noumea staff to provide real-time support to the Suva office. With the development of Intranet services spanning the link it will be possible to ensure that the Secretariat operates in a well co-ordinated manner and all staff access to the information they require promptly.

At the same time, the ComET project will also allow the Secretariat to connect to the Internet with usable bandwidth.

The establishment of a high-speed connection between the headquarters in Noumea and the regional office in Suva, and between the Secretariat and the Internet is a priority for the organisation. Given the costs of the commercial alternative, the preference is for a private network.

The monthly recurrent costs of the ComET project are as follows:

- 64/64kb link between Noumea and Suva: US$1,340
- 128/512kb link between Noumea and Internet: US$8,554

The charge for the 512kb link between Noumea and the Internet will be split between the project partners, so the Secretariat can expect a monthly cost in the region of US$6000 for both links.

By comparison, provision of a 64kb circuit between Noumea and Suva using FINTEL will cost US$19,000 per month and provide no improvement in Internet connectivity.

Management Information Systems (MIS)

In 1998 the Secretariat undertook to replace its financial software system with a new product. Implementation of the chosen replacement product, SunSystems, resulted in significant difficulties. Many of these were due to the poor service provided by the consultant suppler and were overcome by the dedicated efforts of the IT and finance staff within the Secretariat. Although the situation has

improved substantially considerable configuration and training remains to be undertaken to ensure that the organisation realises the fully potential of this substantial investment.

The episode has highlighted the critical nature of "Management Information Systems" (MIS) within SPC. In the quest for more effective planning and effective use of resources, these tools will become increasingly critical to smooth operations.

Development, installation, integration and support of MIS systems must become a priority task for the IT&C unit, ensuring that decision makers have accurate information at their fingertips to allow financial and programming decisions to be made with confidence.

Security

As communications improve so do the potential security risks. There are several threats facing the organisation, of different levels of magnitude:

- Hardware/software failure - provided for by backup and recovery procedures
- Malicious compromise of the system from external sources (hacker attack) - protected by firewall
- Access to information during transit over internet - firewall protection and encryption of traffic

It is important that security threats are kept in perspective; the organisation does not deal with highly sensitive data and until recently the limitations of a slow link to external networks have made the organisation an unattractive target for hackers. All security measures involve a cost, whether it be in inconvenience, support staff time or additional hardware and software.

Care will be exercised to ensure an appropriate security level, without wasting scarce resources.

Training & User Support

The responsibility of user training lies largely with the position of support engineer. Although one of the core functions of the unit, little training took place during 1998 because resources were devoted to the implementation of the financial management software system. Training of staff in IT applications is important to enable staff to make full use of the IT resources available. While IT literacy is a criterion for recruitment to SPC, in practice, staff members in many cases come from environments which do not provide adequate opportunities to acquire sufficient IT skills. The constant advances in IT make continuing professional development a necessity.

The need for user support and training could be met addressed to some extent without additional core budget implications. A number of the Secretariat's technical programmes operate donor funded Pacific Island Trainee attachment schemes. A similar scheme for the IT Unit could meet the dual objectives of building capacity in member countries and of providing additional support to the Unit. The cost would be about CFP units 50,000 per annum (donor funded).

The IT Unit will further develop its training programme to ensure that the Secretariat achieves maximum return for its investment in Information technology and communications.

4.10 Support to Member Countries

Member countries increasingly look to SPC for backstopping services in the area of IT&C. SPC has been able to respond, within resources constraints, to requests that originated from the activities of other technical programmes in member countries. The IT Unit has assisted national fisheries and statistics departments in attaining internet connectivity, supporting the work of SPC's Oceanic Fisheries Programme and statistics programmes. The technical programmes meet the costs of such assignments.

The IT unit is currently a driving force in partnership with the SIDSNet programme of the UNDP to provide improved telecommunications capability and Internet access to one of the SPC's smallest and most isolated countries, Tokelau.

In line with SPC's corporate objective to "provide expert advice on appropriate IT&T options for the region", a proposal for a regional IT support programme, specifically aimed at the needs of the smaller islands members, was very well received by the Committee of Representatives of Governments and Administrations (CRGA) in 1998. If donor funding can be secured, this project will enable SPC's IT Unit to respond to requests from member countries in a much more comprehensive and consistent way than is currently possible under the existing *ad hoc* arrangements.

The current policy of providing IT support to member countries complementing programme activities will continue. A formal regional IT project will be provided if external funding can be identified.

Financial Summary

Recommendation	1999	2000	2001	2002	2003
Core					
Staffing					
Suva Analyst/Program.	50000	50000	50000	50000	50000
PA support	37000	37000	37000	37000	37000
Workstation 'Standard' Software Licensing					
Purchases	0	32203	32203	32203	0
Upgrades	0	15613	15613	15613	15613
Communal Infrastructure					
Software Purchases	6138	0	0	0	0
Software Upgrades	3102	3102	3102	3102	3102
Hardware and support	13032	13032	13032	13032	13032
Totals Core	**109271**	**150950**	**150950**	**150950**	**118747**
Project (Donor) Funded					
Staffing					
Network attachment	50000	50000	50000	50000	50000
Workstation 'Standard' Software Licensing					
Purchases	0	43338	43338	43338	0
Upgrades	0	21012	21012	21012	21012
Communal Infrastructure					
Software Purchases	8260	0	0	0	0
Software Upgrades	4175	4175	4175	4175	4175
Hardware and support	36080	36080	36080	36080	36080
Totals Donor Funded	**98515**	**154606**	**154606**	**154606**	**111268**

Notes:

- The table indicates the projected **incremental** costs that would result from each of the recommendations proposed.
- Several recommendations, whilst concerning items of significant cost, such as the maintenance and replacement of staff workstations, have no **incremental** cost as they are currently being funded out of existing budgets.
- The costs shown for hardware and support represent the **incremental** costs above those already provided for in the IT and finance section budgets.
- The projected costs assume that communal service provision can be split between program and core staff according to representation.

Appendix 1: Communal service provision

Communal Resource provision (CFP Units)						
Hardware			**Noumea**		**Suva**	**Grand**
Servers	**Unit Cost**	**Noumea**	**Total**	**Suva**	**Total**	**Total**
Windows NT	7500	10	75000	2	15000	90,000
Unix	3000	1	3000	1	3000	6,000
Network Hardware						
Hub	350	16	5600	11	3850	9,450
Network Printer	1500	17	25500	8	12000	37,500
Router	4500	1	4500	1	4500	9,000
Modem	350	4	1400	3	1050	2,450
UPS	3000	2	6000	1	3000	9,000
Server Monitor	1500	2	3000	1	1500	4,500
Total Value of Equipment			**124000**		**43900**	**167,900**
Total annual replacement cost (33%)			**40920**		**14487**	**55407**
Total annual maintenance cost (5%)			**6200**		**2195**	**8395**

Support contracts	**Noumea**	**Suva**	
Cisco	450	0	450
RightFAX	2500	2500	5,000
SunSystems	13647	4550	18,197
ThunderByte	1800	1800	3,600
Microsoft	3700	500	4,200
Verisign	1000	0	1,000
Fulcrum	500	500	1,000
LogCaster	500	500	1,000
WebTrends	290	0	290
Total support contract	**24387**	**10350**	**34,737**
Annual maintenance and support			**98,539**
Network user charge			**394**

Rank	Countries	Sessions	SPC Member?	Rank	Countries	Sessions	SPC Member?
1	United States	11570	Yes	60	Iceland	5	
2	Australia	2489	Yes	61	Latvia	5	
3	Fiji	1144	Yes	62	Slovak Republic	5	
4	Canada	975		63	Bulgaria	5	
5	France	929	Yes	64	Dominican Republic	4	
6	New Zealand	865	Yes	65	Yugoslavia	4	
7	UK	606	Yes	66	Mauritius	4	
8	New Caledonia	319	Yes	67	Trinidad and Tobago	4	
9	Germany	250		68	China	4	
10	Japan	223		69	Barbados	4	
11	Italy	195		70	Guyana	4	
12	Netherlands	188		71	Solomon Islands	3	Yes
13	Switzerland	180		72	Kenya	3	
14	Sweden	150		73	Mozambique	3	
15	Belgium	100		74	Botswana	2	
16	Micronesia	100	Yes	75	Bahrain	2	
17	Spain	93		76	Costa Rica	2	
18	Singapore	92		77	Bermuda	2	
19	Norway	80		78	Antigua and Barbuda	2	
20	Finland	78		79	Bosnia and Herzegovina	2	
21	Brazil	72		80	Kiribati	2	Yes
22	Philippines	49		81	Norfolk Island	2	Yes
23	French Polynesia	47	Yes	82	San Marino	2	
24	Denmark	43		83	Uruguay	2	
25	Hong Kong	43		84	Ukraine	2	
26	Taiwan	41		85	Cyprus	2	
27	Poland	39		86	Venezuela	2	
28	Guam	36	Yes	87	Faroe Islands	1	
29	Indonesia	33		88	USSR (former)	1	
30	Ireland	32		89	Yemen	1	
31	Portugal	31		90	Malta	1	
32	South Africa	31		91	Zambia	1	
33	Malaysia	28		92	Kuwait	1	
34	Austria	27		93	Brunei Darussalam	1	
35	Thailand	26		94	Tanzania	1	
36	Cook Islands	24	Yes	95	Vatican City State	1	
37	Greece	23		96	Cote D'Ivoire	1	
38	Israel	20		97	Macau	1	
39	Mexico	20		98	Belarus	1	
40	Argentina	19		99	Namibia	1	
41	India	15		100	Senegal	1	
42	Papua New Guinea	13	Yes	101	Bahamas	1	
43	Korea (South)	13		102	Macedonia	1	
44	Russian Federation	13		103	Zimbabwe	1	
45	Hungary	12		104	Oman	1	
46	Turkey	11		105	Togo	1	
47	Tonga	11		106	Turks and Caicos Islands	1	
48	Luxembourg	10		107	Bolivia	1	
49	Colombia	10		108	Suriname	1	
50	Czech Republic	9		109	Estonia	1	
51	Croatia (Hrvatska)	9		110	Saudi Arabia	1	
52	Slovenia	9		111	Honduras	1	
53	Romania	8		112	Cambodia	1	
54	Vanuatu	7	Yes		**Total**	**21599**	16
55	Arab Emirates, United	7					
56	Chile	6					
57	Lebanon	6					
58	PR	6					
59	Peru	5					

Appendix 2: SPC web site statistics.

Notes:

- Despite the vast majority of user sessions that have originated from the USA as one would expect, the SPC web site has received hits from over 112 countries.
- Many hits reported from the USA from domains 9.com, .edu, and .org may in fact have originated from other countries.
- The SPC web site has received hits from 16 of its member states, although the hits from Pacific Island members are considerably lower than those from the metropolitan members.

Appendix 3: Software licences

Software Licence Summary														
	Unit	Noumea					Suva					(Noumea & Suva)	
	Price	T	O	Require	Cost	Value	T	O	Require	Cost	Value	Total	Value
Server													
Windows NT 4.0	$ 649	10	2	8	$ 5,192	$ 6,490	2	1	1	$ 649	$ 1,298	$ 5,841	$ 7,788
SQL Server	$ 770	1	1	0	$ -	$ 770	1	1	0	$ -	$ -	$ -	$ 1,540
Exchange Enterprise	$1,613	1	1	0	$ -	$ 1,613	1	1	0	$ -	$ -	$ -	$ 3,226
Systems Management Server	$ 492	1	1	0	$ -	$ 492	1	1	0	$ -	$ -	$ -	$ 984
RightFAXNT 6.0	$9,500	1	1	0	$ -	$ 9,500	1	1	0	$ -	$ -	$ -	$ 19,000
LogCaster	$ 299	1	1	0	$ -	$ 299	1	1	0	$ -	$ -	$ -	$ 598
Fulcrum KnowledgeBase	$2,900	1	1	0	$ -	$ 2,900	1	0	1	$ 2,900	$ 2,900	$ 2,900	$ 5,800
Diskeeper	$ 210	10	10	0	$ -	$ 2,100	2	0	2	$ 420	$ 840	$ 420	$ 2,520
NT Quota Enterprise	$1,090	3	3	0	$ -	$ 3,270	1	1	0	$ -	$ -	$ -	$ 4,360
Max2C	$ 646	1	1	0	$ -	$ 646	1	1	0	$ -	$ -	$ -	$ 1,293
Arcserve Enterprise	$ 789	1	1	0	$ -	$ 789	1	1	0	$ -	$ -	$ -	$ 1,578
Arcserve SQL Agent	$ 645	1	1	0	$ -	$ 645	1	0	1	$ 645	$ 645	$ 645	$ 1,290
Arcserve Exchange Agent	$ 645	1	1	0	$ -	$ 645	1	0	1	$ 645	$ 645	$ 645	$ 1,290
NVC Enterprise	$2,000	1	1	0	$ -	$ 2,000	1	1	0	$ -	$ -	$ -	$ 4,000
WebTrends	$1,499	1	1	0	$ -	$ 1,499	1	1	0	$ -	$ -	$ -	$ 2,998
Total Server Products					**$ 5,192**	**$ 33,658**				**$ 5,259**	**$ 6,328**	**$ 10,451**	**$ 58,265**
Upgrades @ 12.5% annually						**4,207.30**					**791.00**	**$ 4,998**	
Workstation													
Windows NT WS*	$ 238	148	2	146	$ 34,748	$ 35,224	74	0	74	$ 17,612	$1,303,288	$ 52,360	$ 52,836
Mac OS 8.x	$ 99	10	0	10	$ 990	$ 990	7	0	7	$ 693	$ 4,851	$ 1,683	$ 1,683
Office 97 Professional	$ 466	141	2	139	$ 64,774	$ 65,706	74	0	74	$ 34,484	$2,551,816	$ 99,258	$ 100,190
Office98 Macintosh	$ 388	10	1	9	$ 3,492	$ 3,880	7	0	7	$ 2,716	$ 19,012	$ 6,208	$ 6,596
BackOffice CAL	$ 198	151	5	146	$ 28,908	$ 29,898	81	0	81	$ 16,038	$1,299,078	$ 44,946	$ 45,936
Diskeeper dient	$ 55	148	10	138	$ 7,590	$ 8,140	74	0	74	$ 4,070	$ 301,180	$ 11,660	$ 12,210
Total WorkStation Products					**$ 140,502**	**$ 143,838**				**$ 75,613**	**$5,479,225**	**$ 216,115**	**$ 219,451**
Upgrades @ 12.5% annually						**$ 17,980**					**$ 684,903**	**$ 702,883**	

* Due to reduced support costs and improved security of WindowsNT workstation, this will become the standard PC operating system, replacing Windows95.

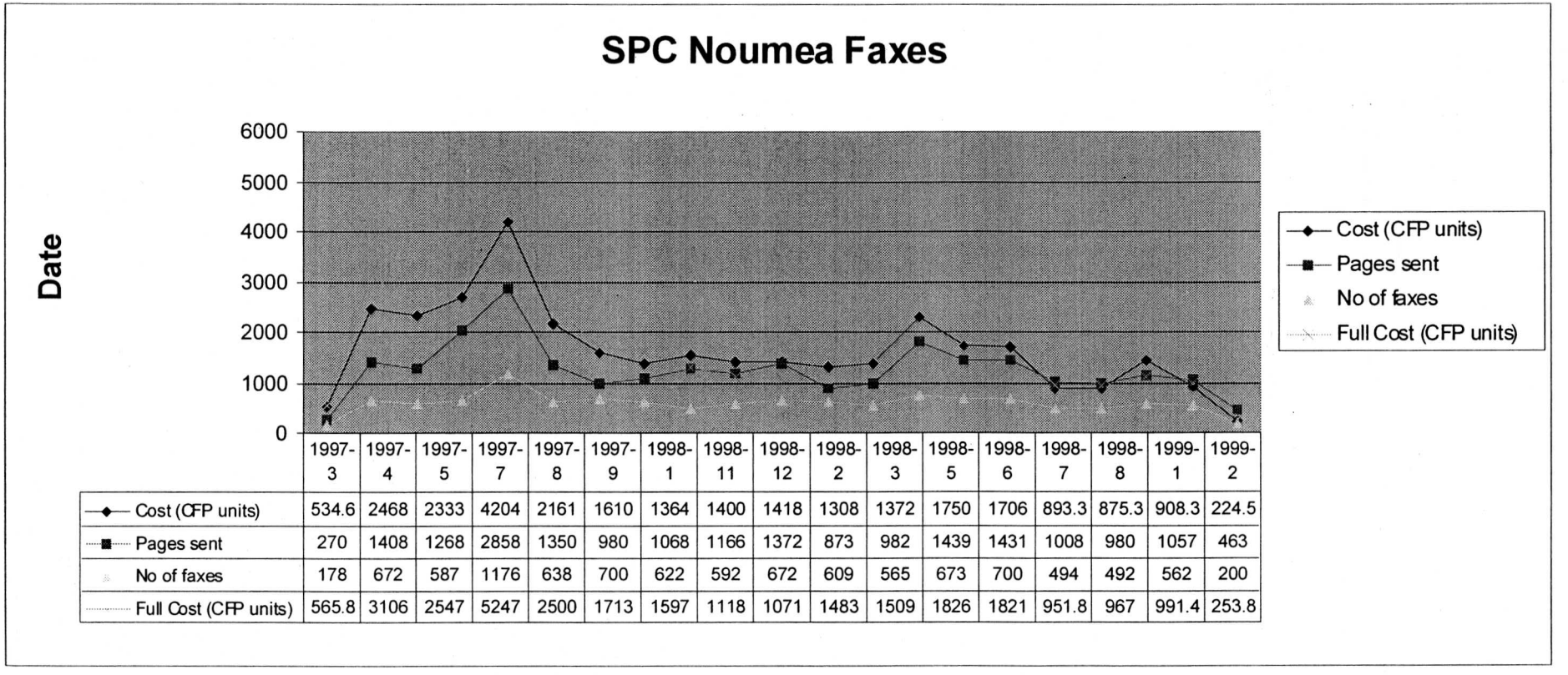
Appendix 4: SPC email statistics

Month	No of Messages	50% Official	Fax Equivalent	Intenet Costs	Saving
1997-01	3357	1679	3357	1750	1607
1997-02	4709	2355	4709	1750	2959
1997-03	7483	3742	7483	1750	5733
1997-09	4649	2325	4649	1750	2899
1997-10	11800	5900	11800	1750	10050
1997-11	12640	6320	12640	1750	10890
1997-12	15994	7997	15994	1750	14244
1998-03	11741	5871	11741	1750	9991
1998-04	8258	4129	8258	1750	6508
1998-05	13481	6741	13481	1750	11731
1998-06	20486	10243	20486	1750	18736
1998-07	11766	5883	11766	1750	10016
1998-08	27632	13816	27632	1750	25882
1998-09	18885	9442	18885	1750	17135
1998-10	26741	13370	26741	1750	24991
1998-11	22415	11207	22415	1750	20665
1999-01	16552	8276	16552	1750	14802
Total saving over 2 years.					**208836**

Notes:

- The number of official messages has been conservatively estimated at 50% of total email traffic
- Fax equivalent has been calculated using an average fax charge of 2 CFP units per fax.
- Statistics relate to the traffic sent from the Noumea office.

Appendix 5: SPC Fax statistics



	1997-3	1997-4	1997-5	1997-7	1997-8	1997-9	1998-1	1998-11	1998-12	1998-2	1998-3	1998-5	1998-6	1998-7	1998-8	1999-1	1999-2
Cost (CFP units)	534.6	2468	2333	4204	2161	1610	1364	1400	1418	1308	1372	1750	1706	893.3	875.3	908.3	224.5
Pages sent	270	1408	1268	2858	1350	980	1068	1166	1372	873	982	1439	1431	1008	980	1057	463
No of faxes	178	672	587	1176	638	700	622	592	672	609	565	673	700	494	492	562	200
Full Cost (CFP units)	565.8	3106	2547	5247	2500	1713	1597	1118	1071	1483	1509	1826	1821	951.8	967	991.4	253.8

Notes:

- Automatic scheduling of faxes for cheap rate has saved approximately CFP units 5000 over a two year period

APPENDIX 23

GIS and Remote Sensing

SOPAC Policy Paper

20 May 1999 v2.3

South Pacific Applied Geoscience Commission (SOPAC)
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SOPAC Miscellaneous Report ____

Contents

1 EXECUTIVE SUMMARY

The purpose of this document is to detail SOPAC's policy on GIS & Remote Sensing with respect to standards, data confidentiality, data exchange and the unit within SOPAC responsible for formulating, maintaining and updating the above as well as recommendations for SOPAC governing council.

2 BACKGROUND

Geographic Information Systems (GIS) have become an essential tool for analysing and displaying spatial data with linkage tabular or attribute data that allows presentation of accurate and timely information to decision makers to assist in the responsible management of the resources of the Pacific Island Countries.

In addition, images from remote sensing platforms such as satellites and aircraft offer a cost effective method for analysing onshore, coastal and inshore resources and the ability to integrate these images into Geographic Information Systems provide valuable tools for resource monitoring, hazard mapping, asset management and land use planning.

SOPAC is the regional organisation that has the mandate for GIS and Remote Sensing due to its extensive experience in applying these tools for developing scalable and sustainable solutions using cost effective and readily available components.

SOPAC is recognised as the most appropriate organisation to provide the link between remote sensing data suppliers, hardware and software suppliers, research institutions and the end users of the systems and data where the cycle of design, deployment and training is essential. This has proved to be the most effective method of assisting member countries with GIS and Remote Sensing applications that are sustainable.

SOPAC conducts 4 programs with 14 units (see Attachment A) where all 9 technical units employ GIS and Remote Sensing in their ongoing tasks. The Information Technology Unit is tasked with overall coordination in this field.

3 STANDARDS

To assist in delivering the most effective services the following standards should be adopted.

3.1 Data Documentation

All spatial data should be fully documented and should include:

- Location of data
- File names and file formats
- Data origin and accuracy
- Data scale
- Projection, spheroid, datum and scale
- Annotation
- Ownership

For example, SOPAC and Fiji Forestry data catalogues are readily accessible at SOPAC's web site. It should be noted that the catalogues only contain the information on the datasets and not the data itself.

SOPAC is in the process of implementing a metadata catalogue format based on ANZLIC recommendation. This metadata catalogue will be available in draft form in August 1999. The metadata catalogue will contain required information for data documentation.

3.2 Data Scale and Sheet Coverage

It is important to recognise that the scale of spatial data defines not only the ratio between the map and the real world but also the accuracy and the representation (generalisation). It is impossible to transfer data from one scale to another. SOPAC will adopt the scale set for individual countries and the following table demonstrates the set for Fiji:

Scale		Suitability
1:	500,000	Overview
1:	250,000	Topographic map series
1:	50,000	Topographic map sheet series
1:	25,000	Topographic map sheet series working sheets
1:	10,000	operational scale Forestry Plantation maps, Utilities in urban areas
1:	5,000	cadastral maps, Utilities
1:	1,000	cadastral maps, Utilities

3.3 Common File Formats

System established within one country should have the export and import facility to deal with agreed common file format of the country, this is DXF for vector data and TIF or ERDAS LAN for raster data in Fiji. Data formats are further detailed in Attachment B.

3.4 Reference of New Spatial Databases

New established databases should be established with the agreed common:

- Data scale
- Projection, spheroid, datum and scale
- Annotation
- Map sheet coverage
- File format

3.5 Data Availability

The main spatial data sources necessary to establish the base of every GIS should be delivered free of charge. This data is:

- The main road network
- The river system
- The main villages and towns
- The main landuse cover
- Contour information or DTM

3.6 Map Projection and Datum

SOPAC will support the main projection used in the country. In Fiji for example, the Fiji Map Grid with WGS72 and not Cassini or other projections will be adopted. It creates unnecessary workload if more than one projection is used in a country. SOPAC will adopt the official projection system as specified by the country or in substitute by the PCGIAP geodesy sub-committee.

For Regional Data or when the Datum is not available SOPAC will use the WGS84 Datum as specified by appropriate body.

3.7 Physical File Format

Standardisation of physical file formats should be adopted in a country and installed software must be capable of import and export to this file format.

MapInfo is the Regional standard as per IT-PACNet recommendations, SOPAC will adopt this file format exclusively for storing Vector data. SOPAC will develop converters to national file format if the need arise.

For Raster Data, SOPAC will adopt TIFF to store image data.

3.8 GIS Software

The regional standard for GIS vector data is MapInfo and the tools include MapBasic with optional addons such as Vertical Mapper. The MapInfo GIS has been adopted under the SPOCC Regional Information Technology Strategies committee that meets annually to review IT standards for member countries of the SPOCC organisations.

4 DATA EXCHANGE

4.1 Open Data Policy

If image data or digital maps are produced through aid donor support, SOPAC will not charge if this data is used by another government sector. For example, if an image backdrop or a street map is created for a power utility under EU funding, SOPAC will not charge if a water utility requires the same data. This policy, however, will be mindful of copyright laws.

4.2 Open Software

When SOPAC provides assistance in developing software the source code and detailed documentation will be provided. In addition, SOPAC will select software that is cost effective and appropriate for the task. SOPAC will adopt the GNU licence format.

4.3 Sustainable Hardware

SOPAC selects and installs hardware solutions that provide the most effective investment for the end user environment that may be subjected to poor power and lack of climate control.

4.4 Communication among Users

SOPAC supports communication between GIS and Remote Sensing users through assistance in setting up e-mail facilities. SOPAC supports the Regional GIS and Remote Sensing newsletter and the GIS-PACNet mailing list and in addition informs all Pacific Islands Countries about available image data for the region and latest technical news through its web site.

To Subscribe to the list send SUBSCRIBE GIS-PACNet to list-request@sopac.org.fj

4.5 Data Clearance

Data held in SOPAC will be classed in 4 categories:

1. Confidential
2. Regional Data
3. Country Data
4. Public Domain

Any person requesting Category 1, 2 or 3 data from SOPAC will need to fill in a form that will be developed either as a standard or customised to suit the situation and submit it to the Director who will seek approval from the Member Country Representatives as appropriate. An undertaking is included that the data is for the sole use of the recipient and cannot be transferred to further parties without similar approval.

Category 4 data is already from the public domain and will be transferred on the understanding that copyright notices are preserved.

All data recipients will inform SOPAC of the purpose of and the work done with the requested data.

5 RESPONSIBILITIES

The unit within SOPAC responsible for formulating, maintaining and updating GIS & Remote Sensing Policy is the Information Technology Unit where any updates will be carried out in consultation with other units and such updates transmitted to the SOPAC Governing Council for endorsement.

ATTACHMENT A - SOPAC CORPORATE STRUCTURE 1999

1. **Resource Development Program**

   1.1 Mineral Resources Unit
   1.2 Water Resources Unit
   1.3 Energy Unit

2. **Environmental Science Program**

   2.1 Coastal Unit
   2.2 Hazard Assessment Unit
   2.3 Ocean Unit

3. **National Capacity Development Program**

   3.1 Human Resource Development Unit
   3.2 Disaster Reduction Unit
   3.3 Information Technology Unit
   3.4 Publications and Library Unit

4. **Corporate Services Program**

   4.1 Finance Unit
   4.2 Personnel Unit
   4.3 Administration Unit
   4.4 Support Unit

ATTACHMENT B - SOPAC Recommended Data Formats.

1 Introduction.

The following document defines the recommended formats for the exchange of data between the secretariat and other organisations. The document is divided in three parts:

1. Media and formats
2. Official Data Formats
3. Other data formats for exchange

The first part describes the media and physical formats employed for data storage, the second the official or recommended formats while the third part describes the data formats that SOPAC secretariat can read or export to, but none of these formats are used for data storage inside the secretariat. It is therefore recommended to provide data in the formats defined in the second part unless it is absolutely impossible by the third party. In the case where none of the formats described are suitable, please contact us directly before supplying any data.

2 Media and formats

The following media and formats are specified in the order of preference. All sizes are native size without any compression scheme,

2.1 DVD-ROM

Size: 12 GB
Format: DVD standard
Comments: This is to become the preferred format as soon as the technology will allow the creation of DVD-R. DVD-Ram medium is currently being evaluated.

2.2 CD-ROM or CD-R

Size: 650 MB
Format: iso9660 or Joliet
Comments: This is the preferred format. It can contain up to 650MB of data. The CD-ROM can be in the iso9660 or Joliet format for support of long file names.

2.3 ZIP disk

Size: 120 MB
Format: PC-Format
Comments: Easiest format to transfer files between computers. ZIP disk and drives are now widely used.

2.4 Floppy disk

Size: 1.14 MB
Format: PC-Format
Comments: This medium is not recommend for Pacific Island Countries due to mould and fungus growth on the media after several months. Floppy disks should be Teflon coated to maximise useful lifetime..

2.5 Exabyte tape

Size: 2 GB or 5 GB (High Density)
Format: Unix tar format, native NT tape backup format, ArcServe 6.5 format.
Comments: No hardware compression or password-protected sessions should be used. DAT and Exabyte are equally preferred.

2.6 DAT tape

Sizes: 2 GB (DDS), 4GB (DDS2), 12 GB (DDS3)
Format: Unix tar format, native NT tape backup format, Arcserve 6.5 format.
Comments: No hardware compression or password-protected sessions should be used. DAT and Exabyte are equally preferred.

2.7 QIC 150

Sizes: 150 MB
Format: Unix tar format
Comments: This media is not recommended for new data exchange, it is only for backward compatibility with older systems.

2.8 Reel

Sizes: 650 bpi or 1200 bpi
Format: Unix dd format
Comments: Lower densities such as 300 bpi are not read by our drive. This media is not recommended for new data exchange, it is only for backward compatibility with older systems.

3 Official Data Formats

The following formats are classified by data type.

3.1 GIS Vector

Format: MapInfo Native format
Additional information to supply: Datum (7 parameters) and projection parameters.
Comments: Preferred format for data storage. MapInfo was the only available low cost GIS software when it was chosen.

3.2 GIS Raster

Format: ERDASS imagine img
Additional information to supply: Datum (7 parameters) and projection parameters
Comments: Raster software is not as convenient and low cost as MapInfo, therefore ERDASS imagine is the recommended application for processing raster data before converting data to GIS backdrop or final GIS vector data. In addition, some raster data can be used in MapInfo through the Vertical Mapper add-in.

3.3 Satellite or Aerial photo

Format: ERDASS imagine img, TIFF
Additional information to supply: Datum (7 parameters) and projection parameters
Comments: ERDASS is used to rectify and correct satellite and aerial photo. Rectified TIFF images can be used for backdrop display.

3.4 Digital Terrain Model

Format: XYZ ASCII delimited
Additional information to supply: Datum (7 parameters) and projection parameters
Comments: The data should not be gridded but simply filtered for errors. Such data is recommended over gridded data as it leaves the operator the choice of grid step.

3.5 Bathymetry and Imagery non gridded

Format: XYZ ASCII delimited
Additional information to supply: Datum (7 parameters) and projection parameters
Comments: The data should not be gridded but simply filtered for errors. Such data is recommended over gridded data as it leaves the operator the choice of grid step. Imagery should be slope corrected as well as other correction.

3.6 Multi-beam bathymetry or imagery raw data

Format: xtf
Additional information to supply: Datum (7 parameters) and projection parameters
Comments: Format developed by TRITON which is now widely accepted.

3.7 DTM/Bathymetry or other Gridded data

Format: Vertical Mapper, XYZ ASCII delimited
Additional information to supply: Datum (7 parameters) and projection parameters
Comments: Gridded data is not convenient as the resolution is already fixed but it may be the only format available

3.8 Seismic

Format: SEG-Y
Additional information to supply: track lines
Comments: SEG-Y is a common recognised format, particular care should be taken in the writing of SEG-Y headers for greater compatibility.

3.9 Ship track, magnetism, gravity

Format: MGD77
Additional information to supply: Datum (7 parameters) and projection parameters
Comments: This format is widely used by the US National Data Centre to collect research vessels activities.

3.10 GPS rover data

Format: NMEA format
Additional information to supply: equipment and accuracy
Comments: none

3.11 GPS base station data

Format: RTM format
Additional information to supply: equipment and accuracy
Comments: none

3.12 CTD

Format: Any
Comments: No format is currently recommended. Format should be provided for interpretation.

3.13 Weather data

Format: Any
Comments: No format is currently recommended. Format should be provided for interpretation.

3.14 Wave data

Format: Any
Comments: No format is currently recommended. Format should be provided for interpretation.

3.15 Document

Format: Microsoft Word, PageMaker
Additional information to supply: version
Comments: Use of styles is highly recommended as well as embedded images rather than OLE documents. For PageMaker all linked documents must be supplied.

3.16 Presentation

Format: Microsoft Power Point
Additional information to supply: version
Comments: none

3.17 Spreadsheet

Format: Microsoft Excel
Additional information to supply: version
Comments: none

3.18 Database

Format: Microsoft Access, Dbase, ASCII delimited (Tab)
Additional information to supply: version
Comments: no format is particularly recommended as most of the SOPAC databases are being transferred to Microsoft SQL Server.

4 Other data formats for exchange

These formats are for the exchange of data. SOPAC can read and write to these formats when no other format is supported or available.

4.1 Image

Format: TIFF, JPEG, GIF, Bitmap
Comments: Particular attention should be given to format that perform lossless compression such as JPEG.

4.2 Raster

Format: DXF, shapefile, ARC-Info export format
Comments: DXF does not contain any attribute data and is not suitable for GIS but only for mapping. ArcInfo data is not readable unless converted in the ArcInfo export format. For all these formats the datum (7 parameters) and projection parameters must be supplied.

4.3 Document

Format: WordPerfect, RTF, ASCII, PDF, HTML
Comments: All major formats can be read, however conversion between formats may loose the pagination. Acrobat PDF is mainly used for export.

4.4 Spreadsheet

Format: Paradox, Lotus
Comments: All major formats can be read.

5 Data from Research Vessels

The following data must be provided when sensors are installed:

1. Bathymetry and Imagery raw data
2. Bathymetry and Imagery non gridded
3. Ship track, magnetism, gravity
4. Seismic
5. Other non gridded data
6. CTD
7. Weather Data

Microsoft and the Internet:

How to configure your server for the worst.

Franck Martin, SOPAC

Internet in the Pacific is expensive, many companies cannot afford high speed connections. The Pacific is all these Island states located in the middle of the Pacific Ocean, not the Pacific Rim. Here in Fiji, we pay USD10, 000 a month for 64kbps. Very early a group of organisation was set up to share such tremendous costs. What we have is a 19.2kbps link shared between 10 organisations. Hopefully by the time you read this, the situation may have changed. With such configuration, setting properly Internet services is quite a challenge. I propose you to share some of my findings.

Why should you care about such slow speed configuration, because the Internet is global and you cannot presume of the Internet quality of your clients. Internet was built at a time when 300bps links where considered fast links. This was at these times that Unix was created not at a time where T1 links are offered to residential US customers. This is the reason why, in general, Unix servers behave better than Microsoft servers in poor network conditions such as low speed or high traffic. For the user point of view low speed or high traffic is equivalent as less packets are transmitted between the client and the server. I propose you here to set up a test computer in a bad network environment. The best way to set your computer for testing is to use a dial-up connection to internet where you have set up the maximum modem connection speed to 300bps or even lower if your modem can support it:
Right Click on your dial-up connection in the dial-up folder. Click on Properties, and click on the Configure button of the modem. Set the maximum speed to the lowest value you can find. Here with my Sportster modem I can set it to 110bps.
In this condition a 1kBytes web page will take about 10 seconds to be downloaded.

The philosophy behind the Internet is that data is organised in packets, which are transmitted to a receiver via a non-specific route. The receiver sends acknowledgement packets to the sender to certify the good reception of the data. What happens when the packets get lost? The sender will wait for an amount of time before declaring the packet lost. This is called the timeout period. In Internet Information Server the timeout period has been configured improperly. When you use Active Server Pages, ASP, the server evaluates if the script has entered an indefinite loop or error if after 120 seconds the script has not finished to execute. It means that the maximum time to create a page is 2mn or that you have exactly 2mn to download the page if the script is generated at the same time you download the page. Here the Timeout is not based on the last packet sent but on an absolute value. The result is that I have never been able to access www.microsoft.com from Fiji due to this configuration. You may have experienced the dreadful error message while surfing:

"The maximum amount of time for a script to execute was exceeded. You can change this limit by specifying a new value for the property Server.ScriptTimeOut or by changing the value in the IIS administration tools. "

If you want to experience the difference surf www.amazon.com and www.dvdexpress.comwith the slow configuration I suggested earlier. The way out depends of the server manager. There are 2 solutions to insert in your script or globally at the IIS 4.0 management console level:

1. <%Buffer=True%>
2. <%ScriptTimeout=480 '(480s=8mn)%>

The first setting instructs IIS to first process the script in the page, save the result in a buffer, then send the result. As the page is processed at the server, it won't take long to generate the HTML before sending it. The downside is that the client has to wait a few extra seconds for the page to complete before it starts to receive some HTML.

The second setting increases the timeout period and gives a few extra minutes to download the page. The first method is preferred.

Now let's move to the caching part. An ASP page by definition is generated on the fly, therefore its lifetime is null. If you look in your browser you will see that the page as already expired because it has just been generated. On my server I use always ASP pages as they allow me to include scripts that will add a banner on top of all the pages. I create then a style for all pages saved in a single file. The problem is that the content of the page does not change, but the page is considered new. Usually I add the <% expires=1200 'mn%> in the server script to indicate to the browser that the page will expire only in one day and that it should be kept in its cache for the time being. ASP pages have the extension .asp in a browser. A program such as squid which is a cache server running on Linux, does not cache pages terminating by asp unless the default configuration is changed. Your pages won't be stored in cache servers because they have the wrong extension. You need to go in IIS management console and specify IIS to treat htm and html pages like asp pages. In IIS 4.0 management console, select the advanced properties of the root web. At the extension level duplicate the settings for asp to a new htm, html extension setting. Basically you instruct IIS to process htm pages through the asp.dll. This is not a problem in my case, as I'm not using html pages but exclusively asp pages. The other advantage is that in case of mirroring, the pages will be saved with their html extension, and cause less problem in the browser. Usually an asp page mirrored will cause Internet Explorer to ask you if you want to open or save the page.

One of the recommendations in slow links is to decrease the Maximum Transfer Unit MTU. In TCP/IP, information is sent by packets. The MTU specify how big the packet should be. Having a large packet allows reducing the proportion between the header and the actual data. The header contains information on who is the sender, who is the receiver and some extra information such as a Circular Redundancy Check, CRC. The CRC permits to check if the packet has not been altered by errors. A single error requires the whole packet to be re-sent. With big packets this costs lot of bandwidth. The second downside is that not many packets will go through a connection per second. We are loosing what I will call the multi-tasking of TCP/IP. I mean, several applications can work concurrently on the same connection and forward different types of packets without starving each other. In general on Ethernet networks the MTU is 1500 bytes by default, on Token ring it is 1700 bytes, but it is recommended for slow connection to set the MTU to 576 bytes. Slow connection can be defined as anything below 64kbps. On Windows 95 or NT you can specify the MTU of the dial-up connection by editing the registry, don't forget to reboot after editing the registry:

- NT

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\<Adapter Name>\Parameters\Tcpip
Value Type: REG_DWORD Number
Valid Range: 68 - <the MTU of the underlying network>
Default: 0xFFFFFFFF
Description: This parameter overrides the default Maximum Transmission Unit (MTU) for a network interface. The MTU is the maximum packet size in bytes that the transport will transmit over the underlying network. The size includes the transport header. Note that an IP datagram may span multiple packets. Values larger than the default for the underlying network will result in the transport using the network default MTU. Values smaller than 68 will result in the transport using an MTU of 68.

- Windows 95

Hkey_Local_Machine\System\CurrentControlSet\Services\Class\netTrans\000n
MaxMTU = 16-bit integer
Data Type: String
Specifies the maximum size datagram IP that can pass to a media driver. SNAP and source routing headers (if used on the media) are not included in this value. For example, on an Ethernet network, MaxMTU will default to 1500. The actual value used will be the minimum of the value specified with this parameter and the size reported by the media driver. The default is the size reported by the media driver.

Now arise another problem linked with the MTU. Due to the ping of death, administrators have disabled the Internet Control Management Protocol, ICMP, as a whole. The ping of death is one of the denial of service attacks. It sends a very large ping, that the server must store before returning it. If the ping data is bigger than the allocated free memory it may put the computer in a very bad state. The quick solution is to disable ICMP, but the ICMP protocol is a vital part of TCP/IP. It sends vital information to senders about the state of the network. It tells the sender to slow down if the network is congested or it tells the sender to send its packet in smaller parts. Here is how TCP/IP works. When a sender communicates with a receiver, it tries to communicate in the most efficient way. The sender tries to adjust the size of packets to the maximum packet size that won't be required to be split due to the MTU of a network segment between the sender and the receiver. If data is coming from a network of a 1500 bytes MTU and needs to be transferred on a network of a 576 bytes MTU, the router will cut the original packets in 576 bytes packets unless the don't fragment flag is set. To find the best packet size the sender will send a packet with the don't fragment flag set. If a router somewhere down the line needs to fragment the packet, then it will drop the packet because the don't fragment flag is set, and will send back to the sender an ICMP packet with its payload data the MTU size the router would like to see. The sender then acknowledges this ICMP packet and send again the data with the specified MTU and with the don't fragment flag till the data is received by the final destination. When the best MTU has been established, the following packets do not have the don't fragment flag. What's happening when a router down the line is not behaving properly or when the ICMP protocol is not properly forwarded or disabled at the sender or receiver is what we call a "Black Hole" router. The ICMP packet is not sent or is not received by the sender this leads to sessions that cannot be established. One of the solutions is to enable the "Black Hole" MTU routing discovery algorithm on the NT machine, and to make sure that the following ICMP filters are set if packet filtering is used.

1. *Path MTUBH Detect is disabled by default, but you can enable it by adding the EnablePMTUBHDetect value entry to the Registry and setting its value to 1. EnablePMTUBHDetect is an optional entry that does not appear in the Registry unless you add it. You must place it in:*

   HKEY_LOCAL_MACHINE\System\CurrentControlSet\Services\Tcpip\Parameters

   You can disable Path MTUBH Detect by deleting EnablePMTUBHDetect from the Registry or by setting its value to 0.

2. In MS-Proxy 2.0, in security, enable filter, add the default ICMP filter.

This problem affects about 5% of the web sites in the world. I have seen it on www.ausaid.gov.au and www.compaq.com sites. The later one was due to an upgrade of the servers and the system manager told me that some patches were not yet reapplied. The condition did not last long, but some network managers do not understand the problem. Usually if your network MTU is smaller than the default 1500 bytes, you will request a web page, a few bytes will come through such as the title page, and the connection will finally timeout. To detect this problem, just use the ping utility. For example, if "Ping <host name or address> -f -l 972" returns packets and "Ping <host name or address> -f -l 973 fails, the largest MTU that can be used over that route is 1000 (972+28).

MS-Proxy needs to be set. If you have enabled packet filtering, refer to the above chapter on how to let ICMP goes through, but you also need to increase the queue size of the connections. MS-Proxy will be used for your internal network to make request to the Internet. The amount of browser requests that MS-Proxy is able to take before MS-Proxy establishes the connections is too small in slow network conditions. This leads to a lot of request timeout at the browser level. The solution is to increase the queue size by editing the registry. Increasing the queue size leads in increased use of memory resources and CPU.

To change the maximum number of connection requests in the queue for each IIS service, add the ListenBackLog key to the registry. Set the value of ListenBackLog to the maximum number

of connection requests you want the server to maintain. You must place ListenBackLog in the registry at:

HKEY_LOCAL_MACHINE\System\CurrentControlSet\Services\Inetinfo

Now you can design your web page by keeping in mind that people have low bandwidth or limited browser. I like to test my web pages with Lynx. It is a text-based browser. If the page is understandable in lynx then the page can be viewed from any browser. The first part is to add the ALT option to each IMG tag. The ALT option will help the browser to display the specified text instead of the image. When you decide not to view pictures the page still make sense. How often do you find a home page composed of a single big image that you must download before continuing. Netscape has a nice feature that is not quite matched by Internet Explorer. You can decide not to load images. Then at a click you will download all the images on the page. In Internet explorer, you need 4 clicks to access the advanced tab of the option window of Internet Explorer and enable/disable pictures. You can shortcut the process by installing the Internet Explorer power tools. This will install an Image button on your menu bar. Unfortunately this button will refresh the whole page instead of only adding the images as Netscape do.

Some final web design tips. Create image libraries on your web site that will be used on multiple pages. When an image is downloaded, it won't be downloaded again if it is reused in other pages. On the GIF and JPG compression, we need to be careful. It is true that JPG compress at a higher level than GIF, but it uses 24bit encoding for each pixel while GIF will use a palette reducing the colour encoding size. It happens that if the image does not use many colours, like a screen capture, the GIF image will be smaller than a JPG image, therefore always test the 2 formats.

A Note about Microsoft Exchange 5.0 and above: It seems from the folks developing sendmail for Linux that they found that about 7% of the messages from sendmail to exchange are not being delivered with a status message of "Connection Reset" and "I/O error". This look so much related to the type of TCP/IP implementation that Microsoft is using for its whole Internet product family. However the problem is fixed with Exchange 5.5 with Service Pack 2. It is not certain if the opposite, message from exchange to the Internet leads to the same behaviour.

It is not difficult to create a slow Internet link. A simple Windows 95 PC can do it. Set the MTU of Windows 95 to 576 as described above and bring down the modem speed to 300bps or lower if you can. Launch several Internet Explorer sessions to several web sites as well as to your site. All of your site functions should still operate even if everything goes slower and slower. In all case you shouldn't get a denial of service due to poor conditions.

Cobalt RaQ 2

Low-cost, high-density Internet server appliance designed expressly for ISPs

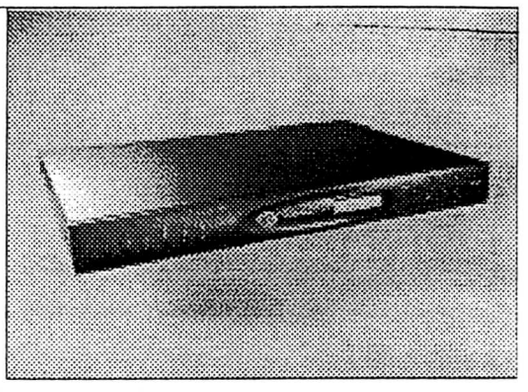
Cobalt RaQ™ 2 server appliances, from Cobalt Networks, Inc., deliver a full suite of Internet services with remote administration capabilities–packaged in a single rack unit (1RU) high industry standard enclosure. Pre-configured with the Apache web server, Sendmail, the Linux operating system, and Front Page server extensions, Cobalt RaQ server appliances provide web publishing, email, and file transfer services at a fraction of the cost of traditional Unix, Windows NT, or even "build-it-yourself" alternatives.

Because of its simplicity and low cost, the RaQ 2 provides ISPs with several alternatives for web hosting. First, ISPs can deploy RaQ 2 as a dedicated server for individual clients. This approach provides clients with a much higher quality of service, increases per-client revenue, and reduces time spent on server administration. Since RaQ 2 is so simple to configure, ISPs can provide "while-you-wait" web hosting services, with complete activation during a single phone call. Second, as a shared server solution, RaQ 2 can support up to 200 sites. Third, as RaQ 2 is based on open-source standards that support a large number of third party solutions, end customers can customize the RaQ and co-locate at ISP sites.

Benefits:

Low-cost hosting

The Cobalt RaQ 2 with name based virtual hosting support represents a pricing breakthrough for Internet servers. The low cost of ownership results not only from an attractive purchase price, but also from the ease of setup, remote administration, and pre-installed software. Since it is built on open-source standards, RaQ 2 is an excellent choice for custom web based co-location solutions.



High server density

The Cobalt RaQ 2 is designed for use in the extremely space-conscious environment of the ISP Network Operations Center. Its single rack-unit enables up to 40 Cobalt RaQ 2 server appliances to fit into a standard equipment rack, or up to 80 when mounted on both sides of a rack. Low power consumption translates to low heat generation, and a rear-mounted fan provides front-to-back flow-through cooling.

Open, standards-based design

The Cobalt RaQ 2 includes all of the software that ISPs and developers need to develop and host web sites, including Apache web server, Perl scripting language, and the Linux operating system. For the programmer, standard development tools include compilers, editors, debuggers, header files, and libraries.

Browser-based administration and maintenance, plus SNMP

All administration and maintenance is browser-based for simple remote administration. The ISP or designated end-user administrator can add and delete users or email accounts, and monitor the system from the browser. Maintenance agents provide alerts if they detect potential problems, giving the administrator time to take action before problems become serious. SNMP support means ISPs can also manage the Cobalt RaQ 2 with the same standards-based network management applications they use to manage other network devices.

Outstanding performance

The Cobalt RaQ 2 can easily handle the requirements of sophisticated sites. Each machine can handle over 250,000 emails, and over 10 million web page requests per day.

Cobalt RaQ 2

ISP and end-user services	• **Web serving** - The Cobalt RaQ 2 server appliance offers integrated support for HTTP/1.1, Common Gateway Interface (CGI) and Perl scripting. • **Email services** - Services include unlimited mail accounts for each domain, automatic vacation responses, automatic forwarding, and group mailing lists. These services can be managed by the client, minimizing the administrative burden on the ISP. • **Internet standard File Transfer Protocol** - All files, from a single text article to a full web site, can be easily transferred to or from the Cobalt RaQ 2 using FTP. • **Virtual domain support** - The Cobalt RaQ 2 offers name based virtual domains (single IP address for multiple domains) or IP based virtual domains (one IP address for each domain). • **Development Environment** - The Cobalt RaQ 2 includes a full suite of standard development tools, including C and C++ compilers, libraries. ISPs or their clients can use these tools to build custom, value-added services.
Hardware	64 bit superscalar processor 16 MB to 256MB DRAM EDO SIMMs (2 slots) 3.3V Internal Ultra ATA hard drive Dual 10/100Base-T Ethernet network interfaces External SCSI port (mini-micro 50 pin, Ultra Narrow) LCD panel for easy set-up and administration Serial console interface
Software	**Software features:** Linux® 2.0 multitasking operating system Apache® 1.3.3 web server, HTTP/1.1-compliant Virtual Hosting Services: name based and IP based CGI support Perl scripting SMTP, IMAP4, POP3 email protocol support FTP, anonymous FTP access Telnet access Domain Name Server (Bind 8.9.1) Front Page Server Extensions NTP client support Optional SSL support Code development environment Legato Networker client Security: PAM/Shadow Passwords **System management:** SNMP management support Browser-based setup wizard Browser-based server management and per-site management interfaces Online ActiveAssist real-time help ActiveMonitor maintenance agents Advanced management using Telnet Web-based performance and usage reporting Browser-based backup and restore utility Browser-based software upgrade
Physical	Dimensions: 17.00 x 12.50 x 1.75 inches (43.2 x 31.8 x 4.5 cm) (fits standard 19" equipment rack; single rack unit height) Weight: 9 lbs 3 oz (4.2 kg) Power requirements: Input rating 100-240V, 50/60Hz Maximum power consumption: 35 watts Operating environment: 32° to 108° F (0° to 40° C) 10% to 90% humidity (non-condensing) Non-operating environment: 14° to 122° F (-10° to 50° C) 5% to 93% humidity (non-condensing) LEDs: Power, Transmit/Receive, Link, Collision, 100 Mbit, Disk Activity, Web Activity
Regulatory approvals	FCC Class B, VCCI-B, UL, C-UL, TUV, CE

Ordering information

Marketing Part Number	Product Configuration
R28 132 EIU	RaQ 2 with 16MB DRAM, 3.2 GB disk, single ethernet
R28 684 EIU	RaQ 2 with 64MB DRAM, 8.4 GB disk, single ethernet
R28 CC0 EIU	RaQ 2 with 128MB DRAM, 13 GB disk, single ethernet
R28 332 FIU	RaQ 2 with 32MB DRAM, 3.2 GB disk, dual ethernet, SCSI
R28 6C0 FIU	RaQ 2 with 64MB DRAM, 13 GB disk, dual ethernet, SCSI
R28 CC0 FIU	RaQ 2 with 128MB DRAM, 13 GB disk, dual ethernet, SCSI
R28 G32 FIU	RaQ 2 with 256MB DRAM, 3.2 GB disk, dual ethernet, SCSI
R28 GF8 FIU	RaQ 2 with 256MB DRAM, 16.8 GB disk, dual ethernet, SCSI

About Cobalt Networks

Cobalt Networks, Inc. is a leading developer of server appliances that extend the reach of the Internet by setting new standards for value, integration, and ease of use. Cobalt's award winning product line – the Cobalt Qube, Cobalt Cache, Cobalt RaQ, and Cobalt NASRaQ are widely deployed as Internet and web hosting server appliances at business, educational institutions and Internet Service Providers (ISPs). Cobalt's solutions are delivered through a global network of distributors, value-added resellers and ISPs. Founded in 1996, Cobalt Networks Inc. (http://www.cobaltnet.com) is located in the heart of Silicon Valley in Mountain View, California, USA, with international offices in Japan, United Kingdom, Netherlands, and Germany.

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COBALT NETWORKS

T0008B-5000 3/99 Printed in USA

Cobalt Qube 2

Internet server appliance for businesses and educational organizations

When it comes to servers, one size does not fit it all. Needs of businesses, offices, branch offices, and educational organizations are very different from those of large organizations. Simplicity, ease of use, and low cost of ownership are critical as such organizations have limited budgets and do not have full time network administrators. However, they still require a wide range of Internet and intranet services—web, email, file sharing, and discussion groups, to foster communications.

The solution: Cobalt Qube 2™ server appliance, from Cobalt Networks, Inc. Optimized for Internet and intranet services, the Cobalt Qube 2 delivers simplicity, versatility, scalability, and excellent performance—at a fraction of the cost of traditional servers.

Features:

Complete suite of Internet services

The Cobalt Qube 2 comes pre-configured with a range of Internet and intranet services for communication and collaboration, including:

- Web publishing
- Email services including scheduled email delivery
- External modem support
- Dial-On-Demand, Full PPP Router
- Security - Firewall, Access Control, and NAT
- HTML page generation and editing
- Cross-platform file sharing
- Private discussion groups
- Document indexing and searching
- Document archival and retrieval
- DNS and DHCP server
- SSL support (optional)

Fast, simple setup and "hands-off" administration

A non-technical person can install the Cobalt Qube 2 server appliance and have it operating in less than 15 minutes. Browser-based configuration and management enables easy addition of users and groups. Automatic maintenance software runs continuously in the background to manage day-to-day details, eliminating the expense of a dedicated administrator.

Scalability and Performance

The Cobalt Qube 2 offers excellent performance for small businesses or workgroups needing simultaneous access to a variety of services. The Qube 2 can easily handle over 150 users and the requirements of even the most sophisticated sites. Each machine can serve over 10 million objects in one day.

Flexible Internet Connectivity

With the Cobalt Qube 2 you have the freedom to choose the right type of Internet connectivity for your business. Connect directly to the Internet using your choice of an external modem, a DSL router, an ISDN router or a high-speed router.

Breakthrough Price

Unlike general purpose servers, the Qube 2 server appliance is designed for the delivery of Internet and intranet services, making it much more affordable to purchase than Windows NT and UNIX alternatives. Its optimized design provides high reliability and very low cost of ownership.

Cobalt Qube 2

End user Services	• **Web publishing** - Create your own web site. The Cobalt Qube 2 offers integrated support for CGI and Perl scripting, and is also pre-configured to support Frontpage Server Extensions. • **Email services** - Individual email, group mailing lists, vacation replies, automatic forwarding, scheduled email delivery and retrieval, and multi-drop support. All standard (POP3, IMAP) email clients are supported. • **Security** - The built in packet filter firewall can easily be configured to protect your company's private data while giving your users full Internet access. Network Address Translation hides yours internal network from the Internet giving you additional protection. • **Cross-platform file services** - Windows® NT, Windows 95, and Mac OS® users can exchange information by dragging file icons to shared volumes. The Cobalt Qube 2 also supports File Transfer Protocol (FTP). • **Private discussion groups** -The Cobalt Qube 2 can automatically create discussion groups. Project teams and workgroups can brainstorm, collaborate, and conduct virtual meetings regardless of their location. • **Automatic indexing and searching** - The Cobalt Qube 2 automatically indexes all text and HTML files for easy retrieval, so you'll never lose an email or document again. • **Document archival and retrieval** - The Cobalt Qube 2 Server Appliance includes the InfoPlace Document Organizer, a web-based application facilitating the easy distribution and retrieval of documents on its hard drive. • **HTML editor** - The Cobalt Qube 2 provides each registered user with their own home page editable with Cobalt's browser-based Page Builder software
Hardware	64Bit superscalar processor 16MB to 64MB 3.3v EDO DRAM SIMMs (2 slots). Upgradeable to 256MB maximum Internal Ultra ATA hard drive Dual, 10/100Base-T Ethernet network interface PCI slot for expansion and wide-area connectivity options High-speed serial port LCD panel for easy set-up and administration
Software	**Technical details:** Linux® 2.0 multitasking operating system Acache® 1.3 web server, HTTP/1.1-compliant CGI support & Perl 5.0 scripting SMTP, IMAP4, POP3 email protocol support FTP, SMB and AppleShare® and AppleShareIP compatible file services Packet Filter firewall Network Address Translation (NAT) Domain Name Server DHCP server Adaptec SCSI card support Code development environment **Services:** Browser-based setup Browser-based administration ActiveMonitor(tm) maintenance agents ActiveAssist(tm) on-line help Text and HTML indexing and searching Private discussion groups Browser-based backup utility Remote software upgrade service Legato Networker Client
Physical	Dimensions: 7.25 x 7.25 x 7.75 inches (18.4 x 18.4 x 19.7 cm) Weight: 6.25 lbs. (2.8 kg.) Power requirements: Input rating 100-240V, 50/60Hz Maximum power consumption: 25 watts Operating environment: 32° to 108° F (0° to 40° C) 10% to 80% humidity (non-condensing) Non-operating environment: 14° to 122°F (-10° to 50°) 5% to 93% humidity (non-condensing) LEDs: Power, Network Activity, Link
Regulatory approvals	FCC Class B, CE, TUV, C/UL, VCCI
Internet access	Internet connectivity requires an external router or modem and Internet service (not included).
Ordering information	Marketing Part Number / Product Configuration Q29 132 NAU — Cobalt Qube 2 with 16MB DRAM and a 3.2GB hard disk Q29 364 NAU — Cobalt Qube 2 with 32MB DRAM and a 6.4GB hard disk Q29 602 NAU — Cobalt Qube 2 with 64MB DRAM and a 10.2GB hard disk

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