



Final Report

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Ministry of Transport, Government of the Cook Islands

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Ministry of Transport

Executive Summary

Student Consultant, Elizabeth Li
Development Partner, Aukino Tairea

I. Background Information

The Ministry of Transport is a government agency of the Cook Islands. Its mission is *to ensure the safety, security, efficiency, and regularity of Cook Islands aviation and maritime activities*. The Ministry of Transport also oversees liquor licensing, motor vehicle dealer licensing, and the Cook Islands Meteorological Service (CIMS).

The Ministry employs seven full-time staff members. Each staff member works at his or her own PC running Windows XP. Most of their work utilizes Microsoft Office products, including Word, Outlook, Excel, and Access. Communications are done either in person, by phone, or over e-mail. The staff store and share all of their electronic work documents on a shared server, accessed on their PCs via the S: drive. The Ministry has no designated individual in charge of IT management and planning, usually calling external services for assistance.

II. Consulting Tasks

The student consultant first assisted the Ministry in reorganizing their shared server. With many outdated files, duplicates, unsorted folders and inconsistent naming, the existing setup of the server made it difficult for the staff to find the documents they need. The consultant worked with the Ministry staff to revise the folder hierarchy and establish naming conventions.

The consultant also helped the Ministry publish its Joomla website, which had not been worked on in three years. Desired content included up-to-date information on each division, legislations and forms available for download, job vacancies, and contact information. The website would improve external communications by reducing walk-in, phone and e-mail queries.

To improve internal communications and productivity, the consultant developed a Joomla-based intranet that included news and announcements, a shared calendar, shared contacts, and a task manager. The consultant trained the staff and provided Joomla documentation on maintaining both the website and intranet.

During a four-day trip to the island of Aitutaki, the consultant observed work processes at two of the Ministry's operators, the Airport and the Ports Authority, and made recommendations on how those processes could be simplified using IT.

Finally, the consultant searched for ways to improve the Ministry's data management, especially in licensing operations. The consultant conducted training on basic database design and worked with the Ministry to explore the relationship between Access and Excel.

III. Outcomes Analysis and Recommendations

The shared server's folder structure was successfully reorganized and a naming convention established. The sustainability of this solution is dependent on the staff's engagement and responsibility over their own files and folders.

Although progress was made on the website, including some new content, functionality and a more professional design, it is far from complete because the staff was slow in contributing content. Again, staff engagement is key in making the website successful in the long run.

The intranet was completed with all desired features and was met with positive staff feedback, particularly on the shared calendar. The long-term challenge is integrating this new technology into the Ministry's daily workflow.

At the Aitutaki Airport, the consultant recommended making a part of their process electronic to simplify information management and reporting. At the Ports Authority, the consultant created an Excel spreadsheet and accompanying documentation to save time on repeated calculations.

To eliminate duplicate work and data in the licensing database, the consultant proposed a change to the database design: separating receipt information into a new entity. However, due to greater priority on the other tasks, this change was not implemented before the consultant's departure.

Other recommendations include:

- Regularly test backups to ensure they work in the event of a server crash
- Log all IT faults so the Ministry can monitor and fix recurring problems
- Designate a small committee to manage and plan IT for continuing growth
- Hold regular workshops to maintain skills and interest in IT

The government's ICT division can support the implementation of these recommendations.

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Ministry of Transport

Final Consulting Report

Student Consultant, Elizabeth Li
Development Partner, Aukino Tairea

I. About the Organization

Organization

The Ministry of Transport is one of several ministries in the Government of the Cook Islands. It was originally formed in 1996 as the Ministry of Tourism and Transport. Transport was separated from Tourism in 2000.

The mission of Ministry of Transport is to ensure the safety, security, efficiency, and regularity of Cook Islands aviation and maritime activities.

The Ministry's vision is "to provide a safe and sustainable transport system" (Tairea). The government funds Ministry activities.

The Ministry is responsible to many stakeholders, including airlines, the Airport Authority, shipping providers, and license holders. Specific individuals include the Public Service Commissioner, who the Secretary of Transport reports to, and Minister of Transport, who reports to the Cabinet.

Facilities

The Ministry of Transport's offices are located in the town Avarua on the island of Rarotonga. The offices are on the top floor of a building at Avatiu Harbor, above a shipping company.

The space is small but not crowded. There are four enclosed offices, five other desks dispersed in the open center space, and two extra rooms used for storage. Furniture includes desks, chairs, and many cabinets used to store paper documents. Aukino also has couches and a coffee table in his office for meetings. Other assets include a small kitchen, bathrooms, and a separate meeting room in the back with a long table and chairs.

Ceiling lights and daylight through windows provide lighting. The space is air-conditioned and has 24-hour access to electricity. Although there is no physical protection beyond door locks, security in the office and the general surrounding area is good.

Programs

The Ministry of Transport has three major program areas:

- Civil Aviation: responsible for the safety, security and compliance of international and domestic air services.
- Maritime: responsible for the safety, security and compliance of international and domestic shipping services.
- Management: responsible for organizational administration, coordination, support, financial management and reporting. Liquor and motor vehicle dealer licensing are also managed under this division.

The Energy division was previously under the Ministry of Transport, but has been transferred to the Ministry of Infrastructure and Planning as of July 1, 2010 (Tairea).

The Cook Islands Meteorological Service (CIMS) came under the Ministry of Transport as of July 1, 2011.

Staff

The Ministry of Transport currently has seven full-time staff members, two vacant positions, and two part-time employees.

Aukino Tairea is the Secretary of Transport and has been for over 14 years. His responsibilities include managing the outputs of the Ministry, regulatory functions, and overall management. Diverse skills and management experience are required for his job. On a day-to-day basis, Aukino uses Microsoft Outlook, Microsoft Word, his phone, and not much else. He finds technology difficult to use.

Oscarlina "Oscar" Tapoki is the Aviation Security Specialist. Her responsibilities include inspecting airlines and conducting training. She has been in her position for almost 3 years and used to work for the Airport Authority as a security officer, supervisor, and trainer. In her work, she uses Word, Excel, PowerPoint, and Outlook. Although Oscar is not a formal IT expert, she is interested in exploring the benefits of technology to the Ministry's work. Oscar has been the student consultant's primary liaison to the Ministry.

Harriet Williams is the Licensing Officer. She receives applications for liquor and motor vehicle dealer licenses, prepares the licenses, and arranges meetings with the authority to get the licenses approved. Harriet has worked for the government for 23 years in various levels of Transport and has been doing liquor licensing with the Ministry for 8 years. Communication skills are important for her job, as she often must deal with the public. Harriet's technology use includes Access, Excel, Word, and a typewriter.

Tepora "Deb" Solomona is the Financial Controller. She is responsible for all of the Ministry's financial transactions, budgeting and reporting. She also does administrative work such as leave entitlements. Deb has been with the Ministry since its founding. She received financial training from the government as well as in Australia for 3 months. Deb hardly uses technology and is not interested in it.

Teokotai "Tai" Cummings is the Ministry of Transport's Private Secretary. In her work, she mainly uses Outlook, Word and the phone.

Ned Howard is the Director of Marine. He administrates the Cook Islands' entire marine sector. His technology use is largely restricted to Word, Outlook and phone.

Assisting Ned is Stephen "Steve" Simpson, the Maritime Training Centre Manager/Tutor.

The Maritime Administrator position is currently vacant.

Deb's former assistant, Amanda Pauka, has moved to another government department but still works for the Ministry part-time, entering financial data into MYOB and QuickBooks once a month. Her previous position of Finance Officer is currently vacant.

Mathilda Tairea, Aukino's wife, works part-time at the Ministry entering seafarers' detail into the shipping registry, a Neptune database based in the Secretariat of the Pacific Community (SPC) in Fiji.

Technical Environment

Hardware

Each staff member has his or her own workstation set up. Mixed types of hard drives, monitors, and keyboards are used across the Ministry. Oscar also brings a personal laptop to work. The computers all run separate installations of software and are not connected except by the local area network and shared server.

Software

All PCs in the Ministry run Windows XP Professional. Oscar's laptop runs Windows Vista, though she has expressed interest in updating to Windows 7.

The primary application software used as work tools are Microsoft Office 2007 applications, including Word, Excel, PowerPoint, Access, and Outlook. In addition, Mathilda uses Neptune in her database work for the SPC, and the finance staff uses MYOB and QuickBooks, the finance software packages provided by the government. The Ministry uses ESET NOD32 Antivirus 4 as its antivirus software. Backups are done using Cobian Backup.

Shared Server

The Ministry keeps all of its electronic work documents and databases on a shared server. It was set up by an external IT specialist. The physical server is an IBM System x3200 M2 located in Deb's office and runs Windows Server 2003 Standard Edition. On staff PCs, the server is accessed via the S: network drive. The only staff members with administrator access are Oscar and Harriet.

In the past, the shared server froze every week. When this happened, Oscar would reboot the server and call an IT expert for assistance. However, this problem has not occurred in the past six weeks.

Internet Connection

The Ministry of Transport's Internet service provider is Telecom Cook Islands, the primary telecommunications company of the Cook Islands. Broadband plan and usage information can be found on Telecom's Internet portal, Oyster. The Ministry's monthly plan has a speed of up to 512 KB per second and a maximum volume of 3GB. The staff finds the connection very slow.

Other Equipment

Each staff member has a telephone with an assigned extension number at his or her desk. Shared equipment in the office include a printer, copier and scanner, and several fax machines. Harriet also uses a typewriter for typing licenses on cardboard paper.

Technology Management and Planning

Who is Responsible

The Ministry of Transport currently has no designated individual or committee in charge of managing, planning, or budgeting technology. Historically, the Ministry has never had such a person. However, Oscar recently became interested in IT because it has helped her work.

If there is a problem with technology, the Ministry simply calls someone who has the expertise to address it. For simple problems, this is usually Oscar; for more complex problems, the Ministry often acquires the services of an external IT specialist, such as Harriet's nephew Tariu Tairea. Harriet occasionally requests assistance from the ICT Division at the Office of the Prime Minister. The Ministry rarely reports or logs problems.

Equipment maintenance is varied. The photocopier is maintained by the machine's service provider. The ICT Division sponsors two PCs. For other machines, the Ministry must allocate its own operating funds to replace them if they are broken.

Backups

Data is backed up daily in Deb's office on a Western Digital hard drive. The Ministry also does a secondary backup every Monday, which is taken off site for the rest of the week. These backups are a huge improvement over past backups, which were irregular and involved dragging and dropping files instead of using specialized software. Unfortunately, none of the backups have ever been tested or used to restore anything, so the Ministry does not know if files have been lost.

Updating Software and Virus Definitions

There are currently no concrete plans to install new software or upgrade existing software. If the staff feels that new software is necessary, they must do research and convince Aukino why it is needed. For updating virus definitions, the Ministry subscribes to a provider. The current program's license was just renewed in April and will run for the next three years. The Ministry has had no problems with viruses and spyware in the past.

Internal and External Communication

Because the Ministry of Transport is so small, internal communications are conducted mostly in person and infrequently through e-mail. File sharing is done using the shared server, though some staff members e-mail files as attachments. This practice is inefficient, a waste of space, and causes confusion in which of the multiple copies of a document is the official version.

External communications are mostly conducted through phone or e-mail. Licensing operations occasionally require use of the post office. There is a website in development, but the staff member who was working on it is no longer with the Ministry. There has been no progress on the website for 3 years, making most of the content outdated.

The Ministry has web access at work, and the browser of choice is Internet Explorer 7 or 8. Microsoft Outlook is used to check e-mail. This e-mail cannot be accessed remotely, so staff members use a separate Hotmail account in the rare times they need to send e-mail while traveling.

The only errors the Ministry has experienced with communications were caused by human error, e.g. forgetting to save or accidental deletion.

Information Management

The Ministry of Transport manages its information both by paper and electronically. Most important paper documents, e.g. certificates, are kept on cabinet shelves. Less important documents, e.g. correspondences, are kept in filing cabinets with a file reference. Many files are paper only. Some are electronic only, such as the databases. Other files have both hard and soft copies. The Ministry is attempting to gradually move away from paper.

For the most part, there is little overlap and interaction between divisions; each division focuses on its own work. Some work requires information flow across multiple divisions, such as correspondences and some licenses. Most information flow among staff is up and down, to and from Aukino, who must oversee everyone's activities.

The information most critical to the Ministry, including details on licenses, seafarers, certificates, and other functions, are stored in various Access, Excel, and Neptune databases. The Access and Neptune databases were built by external services while the Excel spreadsheets were created internally. There is little consistency in database management within the Ministry.

Harriet's situation is of particular interest. She currently enters individual liquor license data using a form in Access and uses Access to generate monthly, 6-monthly and annual reports.

Harriet also enters a subset of that same data, the receipt information and fees, chronologically into an Excel spreadsheet and uses that for financial reports. She then checks these reports against each other for numerical errors. This pattern presents the problem of duplicated work, entering the same data repeatedly. In addition, Harriet saves a new copy of her databases with new names every time she updates them, resulting in multiple copies with small differences. These copies are difficult to distinguish. Harriet never received training in using Access.

Business Systems

Currently, Deb manually manages the Ministry of Transport's accounting processes. Her former assistant comes in a few hours per month to enter the records into MYOB and QuickBooks. The electronic copy is checked against the manual copy for errors. Reports are sent to the Ministry of Finance and Economic Management every month. It is important to send these reports punctually and ensure their accuracy and compliance with government standards. If reports are not sent on time, the Ministry of Transport does not receive its monthly funding. If faults are found in reports, the MFEM questions the Ministry. The government handles payroll and other benefit systems; the Ministry submits staff hours.

Deb has been with the Ministry since its beginning and has always managed financial records manually. Unfortunately, she is not interested in technology. Because the same records must also be entered into financial software each month, duplicate work exists. It is possible this process will change once the vacant Finance Officer position is filled.

II. Scope of Work

Task 1. Reorganize the Shared Server

As mentioned in the Technology Infrastructure section of this report, the Ministry of Transport stores all of its electronic work documents on their shared server. The server contains over 10,000 files in various file types, including Microsoft Word, Excel, PowerPoint, Access, and PDFs. The files are currently organized into several levels of folders and subfolders. The first level is by division, e.g. Civil Aviation, Maritime & Shipping, and Finance; the second level is by task, e.g. licenses and permits, accidents and incidents, manuals, and legislation. Third levels and beyond vary in organization. The contents of the server are backed up daily and weekly.

The student consultant found many problems with the current setup of the shared server. There are too many files, many of which are duplicates or outdated versions. No method of prioritization is in place, miscellaneous unsorted files and folders occur at every level, and naming is inconsistent within and across folders. Because staff members do not have an established naming convention to follow, they later have trouble remembering where they saved their files. The shared server is also only accessed via the Windows Explorer UI, which can be confusing to navigate and is limited in search capability, as one must remember part of the filename. In short, the current setup makes it difficult for the staff to find, distinguish, and retrieve what they need.

To address these issues, the student consultant proposes simply reorganizing the contents of the shared server. The consultant and the Ministry will need to jointly analyze and improve upon the current folder hierarchy, documenting where files and folders are moved. The Ministry must establish and enforce a naming convention. Prioritization can be accomplished by separating outdated files, and symbolic links can be used to decrease the distance to desired files, e.g. grouping together shortcuts to similar tasks. These new rules, conventions, and organizational schemes will be recorded in a constantly accessible document to encourage sustaining practice. Effectively reorganizing the shared server will improve the Ministry's workflow.

Expected Outcomes:

- Rules and conventions for saving files in the shared server developed based on staff input and documented for continuing reference
- Folder hierarchy revised based on staff input
- At least 20% of existing files in the server renamed according to new naming conventions
- All new files added to the server named according to new naming conventions

After the root organizational issues are addressed, the Ministry can transition to a more sophisticated document management system; see Task 3: Implement an Intranet.

Task 2. Complete and Publish the Ministry Website

The Ministry of Transport currently does not have a live public website. A Joomla-based website is in development, but it has not progressed for three years because the staff member that had been working on it left the Ministry. The three-year hiatus made the little existing content outdated and irrelevant. Without a website, the Ministry does not have an online presence to provide information to external, including global, audiences. Where clients could quickly look up legislations or print license applications from the website, they must instead

walk into the Ministry's office, make a phone call, or send an e-mail to request information and documents. The Ministry receives public inquiries daily.

The student consultant will assist the Ministry in completing content for the existing Joomla website and publishing it. In addition, to promote sustainability, the consultant will work with the Cook Islands Government's ICT Division to train Ministry staff in updating and maintaining the website using Joomla. A completed and well maintained website will improve the Ministry's external communications.

Expected Outcomes:

- At least one staff member from each division trained to add and edit content through the frontend and be responsible for his or her division's content
- One or two staff members trained to maintain the site through the Joomla backend
- Website includes, at a minimum, the following content:
 - Up-to-date information about each division
 - Legislations available for printing
 - Application forms available for printing
 - Job vacancies
 - Contact information
- Help documents created for continuing reference

Task 3. Implement an Intranet

An intranet was one of the original expected outcomes the Ministry of Transport provided to the student consultant. Requested features included a new document management system, shared calendar and contact list, quick links to databases, automated numbering of documents, and digital forms. Upon further analysis of the organization and research of existing products on the market, the consultant determined that the chosen intranet solution must be inexpensive, given the Ministry's limited funding, and as simple as possible, given the staff's limited IT expertise. SharePoint, a popular intranet solution, is too feature-rich and costly to bring additional value to the Ministry.

The consultant recommends developing the intranet using Joomla, the same platform used for the Ministry website. Skills learned from maintaining the website can be applied to the intranet. Joomla has many free extensions available to add features such as shared calendar, shared contacts, project management, and digital forms. In addition, Joomla has become a government standard on the Cook Islands, supported by the ICT Division as well as a wider vibrant community of developers, making it a good option for effective maintenance.

Staff input showed universal agreement that the intranet ought to be a separate internal site rather than a restricted section of the public website mimicking an intranet. Thus, the consultant proposes hosting the intranet on the shared server and will assist in installing the necessary components. Internal hosting provides the extra benefits of avoiding bandwidth costs and faster performance.

The consultant recommends focusing first on news and announcements, shared calendar, and shared contacts. These features will help improve communications within the Ministry and assist in communal tasks such as scheduling meetings.

Next, the intranet can incorporate a document management system such as DOCman. The system will allow the Ministry to track more information about files and improve search. The consultant recommends implementing this feature after the shared server has been reorganized; simply moving the files to a new system does not solve the root organizational issues.

Finally, the Ministry expressed difficulty in keeping track of action item deadlines and their associated documents, such as when individual certificates expire. A project or task management feature will alleviate that difficulty.

Expected Outcomes:

- Joomla and its technical requirements installed on shared server
- All staff members trained to use features on the frontend
- One or two staff members trained to maintain the intranet through the Joomla backend
- Intranet includes, at a minimum, the following features:
 - News and announcements
 - Shared calendar
 - Shared contacts
 - Document management
 - Project/task management
- Help documents created for continuing reference

Task 4. Make IT Recommendations to Operators in Aitutaki

The Ministry of Transport's aviation and maritime regulations extend not only to Rarotonga, but to all of the smaller, less developed islands as well. To observe this reach, the student consultant will go on a four-day trip to the outer island of Aitutaki and visit the Airport and Ports Authority there. The Aitutaki Airport and Ports Authority are subsidiaries of the Airport Authority and Ports Authority, respectively, both of which are headquartered in Rarotonga and regulated by the Ministry of Transport.

The student consultant will observe and document the work processes at the Aitutaki Airport and Ports Authority and make recommendations on how IT can make those processes more efficient. In addition, the consultant will collect any relevant information about those organizations to be included on the Ministry of Transport's website.

Task 5. Improve Data Management

The student consultant observed several problems with current data management in the Ministry of Transport, particularly with Harriet's licensing operations. As described previously in the Information Management section of this report, Harriet maintains a Microsoft Access database and an Excel workbook for two different types of reporting, but enters the same data in both applications. Both types of reports can likely be generated using just Access or just Excel. The fundamental issue is lack of training and consequent lack of understanding of how these applications are meant to be used, i.e. for relational vs. flat tables.

The consultant proposes working with the Ministry to further explore Access and Excel's capabilities, make improvements to the Ministry's current data management to eliminate duplicate work, and conduct basic training in database design. These outcomes will increase productivity and prepare the Ministry for future data management needs.

Expected Outcomes:

- All staff members have better understanding of Access and Excel, when to use one vs. the other, and how to use them together
- At least two staff members trained in basic database design, including data types, records, tables, relations, entity relationship diagrams, and normalization
- Current data management practices adjusted based on new knowledge

III. Outcomes and Recommendations

Task 1. Reorganize the Shared Server

The student consultant worked with Oscar to evaluate and edit the server's high-level folder organization. First, to reduce redundancy and confusion, several folders were merged. The Admin and MOT folders were combined into one Admin folder, as they had both served administrative purposes. The Maritime and Shipping subfolders, which contained same or related content, were merged as first step to cleaning up the Maritime section.

A new folder was created for the Cook Islands Meteorological Service (CIMS), an organization newly under the MOT umbrella beginning this year. Later, another new folder was created for the Cook Islands Maritime Training Centre (CIMTC) as a separate workspace for Steve, since most of the documents under Maritime are used only by Ned.

The consultant and Oscar then evaluated possibilities for using shortcuts to make files more accessible. Options considered:

- a) Keep original documents in their division folders; use outside folders to group together shortcuts. For example, create a Licenses folder containing shortcuts pointing to each division's own license folders.
- b) Pool original documents in a single location organized by type. For example, group all divisions' license folders in together in a Licenses folder. Then create shortcuts within division folders to the pooled location.
- c) Put document folders or shortcuts in the Admin folder.
- d) Put document folders or shortcuts in a separate top-level folder.

Ultimately, the decision was a combination of options b and d. The original documents were pooled in separate top-level folder named Important Documents, and shortcuts to Important Document subfolders were created within division folders. Refer to *Appendix A. Shared Server Screenshots* for before and after screenshots. All high-level changes made during the month of June were logged in a Word document and made accessible to the staff.

The consultant wrote several best practices for naming and organizing folders, such as putting dates in filenames of date-dependent files or files with multiple copies, using revealing file names, deleting obsolete files, and separating older versions of files from current working copies. Meanwhile, Oscar developed, with input from the other staff, a filename format for general use:

Section - Type - Title - Reference or Version Number - Date

Section means division and is labeled using a shorthand code, such as CA for Civil Aviation and LLA for Liquor Licensing Authority. A reference number is only required for letters.

Oscar and the consultant combined their work to create a single naming conventions document, made accessible to all staff on the root level of the server drive. The document is attached in *Appendix B. S: Drive Naming Conventions*. Oscar also created quick reference cards for each staff member's desk and led a staff meeting, followed by individual training, on how to use the new format, emphasizing use on letters.

All new documents added to the server used the filename format. The most commonly used files and folders were also renamed using the format. Oscar and the consultant began going through the other older files and folders, reorganizing and renaming files, deleting duplicates. It was

soon apparent that the original goal of having 20% of files renamed before the consultant's departure was unrealistic, given the attention needed to complete other tasks and the sheer number of files in the server—over 10,000.

The consultant and Oscar also faced the challenge of lack of staff engagement. Staff agree that the conventions are beneficial and that they should follow them, but in practice they do not actively think about it. Ideally, for the most productivity in improving the server, each staff member should take charge of his or her own division folder.

Complete renaming and reorganization of the shared server will depend on the staff gradually doing it themselves and forming new habits.

Task 2. Complete and Publish the Ministry Website

Retaining the structure left by the previous developer, the content was organized such that each primary public-facing function had its own section of the site with relevant article categories. These five sections were Civil Aviation, Maritime, Liquor Licensing, Motor Vehicle Dealer Licensing, and CIMS. The three larger functions, Civil Aviation, Maritime, and Liquor Licensing, each received a submenu that appears only when the user has navigated to that section. CIMS just includes a short description and a link to the CIMS website.

The consultant trained Oscar, Steve, Ned and Harriet on updating the content using the Joomla frontend. Each individual is meant to be in charge of content for his or her own sections. The consultant also trained Oscar in managing the site's menus and configuration from the Joomla backend.

To provide legislations and forms for download, the website is using DOCman to store and organize documents, and the DOCLink plugin to link directly to documents within articles.

For a more professional layout, the consultant downloaded a free template from JoomlaShack called Jamba. This template was chosen because of its user-friendly design, flexibility, multiple color schemes, and documentation in the demo containing helpful information on module positions and styles. The consultant created a customized Ministry of Transport header with the Cook Islands crest for each color scheme.

To make the content more interesting, photo slideshows were added using the component DJ Image Slider. The first use of this component was on homepage. The consultant contributed photos of Avatiu Harbor, the Airport in Rarotonga, and the Aitutaki Airport trip.

Refer to *Appendix C. Website Screenshots* for visuals. The live website can be viewed at www.transport.gov.ck.

The consultant wrote a lot of detailed frontend and backend documentation. Some documents are general step-by-step guides to updating content; others are specific to functions and settings of components, e.g. a DOCman backend guide.

Unfortunately, the website is far from complete. Majority of the content is still missing, including the important legislations and forms. Two primary challenges were faced:

- Frequent network downtime prevented access to website.
- Lack of content contribution from staff. Similar to the lack of engagement with the shared server, the staff acknowledge the benefits of and their responsibility towards the website, but are slow to act upon it.

Oscar would like to increase momentum after the consultant leaves, setting a goal of having most of the website complete by the end of August.

Task 3. Implement an Intranet

The student consultant did most of the technical work on this task independently. However, the consultant made sure to frequently ask for and incorporate staff input. Development was generally iterative with a cycle of developing a particular feature, making the edits live for the staff to test, reevaluating the implementation based on feedback, then going back into editing.

The consultant installed WampServer, then Joomla onto the server computer. Intranet files were added to the normal daily backup. The consultant chose another template from JoomlaLashack similar in structure to the website template to create consistency between the two sites. As according to Scope of Work, the consultant first completed news, calendar, and contacts before moving onto the more complex features of document and task management.

News and announcements were implemented using Joomla's built-in article editor. Articles can be added using a "Submit an Article" link under the User Menu for logged in users. This method of adding articles is the same process used for the website.

The shared calendar utilized the JEvents component. Color-coded event categories were created for each staff member as well as for All Staff, Public Holiday and Other. Everyone's events are displayed together by default, but JEvents also allows filtering by category so that staff members have the option of viewing their own events separately. A Latest Events module was added to the sidebar for a quick view of upcoming events from anywhere in the intranet. Finally, the consultant figured out a personal calendar solution for Ned using filtering, though he was the only staff member who expressed the need for one.

QContacts was used to replace Joomla's built-in Contacts component because of its additional "section view" option to see the list of categories from frontend. Contact forms were eliminated because the intranet was not using a mail server. Categories created include Airlines, Civil Aviation (general), Government, Staff, and IT Help. QContacts currently only supports editing from backend, so the consultant trained Oscar and Ned on the backend so they could take charge of Civil Aviation and Maritime contacts, respectively.

The consultant and Oscar decided that with the newly reorganized shared server already improving document management and the staff accustomed to the Windows Explorer UI for viewing files, DOCman or another document management extension was not necessary.

Task management was implemented using the project management component Projectfork. Since large projects are uncommon at the Ministry of Transport, the consultant simplified the component to eliminate the projects aspect as well as files, discussions, and user groups. The consultant created a single "project" with all staff as members. The only sections kept were those that would be useful to staff: dashboard, tasks, calendar of task deadlines, and time tracking.

Shortcuts to the website and shared server were added to the main menu for easy access. A short URL for the intranet was also created; the staff can access the intranet from any Ministry PC by typing "mot/intranet" in a browser. To make access even simpler, the intranet was set as the homepage or a favorite on all PCs.

Refer to *Appendix D. Intranet Screenshots* for visuals.

The consultant created user accounts for every staff member except Deb, who almost never uses her computer. All staff members with accounts were trained in adding and editing news and calendar events.

As with website, the consultant wrote a lot of detailed documentation, including component-specific guides such as Projectfork and QContacts guides. The consultant also provided links to help resources such as official Joomla documentation and forums, the Joomla Extensions Directory, JoomlaShack template demos, and components' individual documentation. Finally, the consultant found and shared a video tutorial for backing up and restoring the Joomla 1.5 database in the event of data loss. The consultant practiced this process once with Oscar and recommends repeating it at least twice per month.

The challenge with the intranet is integrating it into daily workflow. The staff are conscious of the intranet. They are using it to an extent; most notably, the shared calendar has been a popular feature from the start. However, the staff has yet to fully realize the intranet's full potential as a tool to increase productivity.

Joomla is flexible enough that the Ministry can easily disable or install features at any time to suit their specific needs. The consultant is interested in evaluating how the intranet is being used over the next few months.

Task 4. Make IT Recommendations to Operators in Aitutaki

A common theme that the student consultant found throughout the Aitutaki trip is that IT expertise and resources in the outer islands are far inferior to those available in Rarotonga. In addition, both the Airport and the Ports Authority in Aitutaki have much simpler processes than their governing organizations in Rarotonga. Thus, there was much less in Aitutaki to work with. Nevertheless, the consultant was able to make recommendations on major processes to both operators.

The Aitutaki Airport uses daily checklists to perform safety and equipment checks on their trucks, lighting and runway. These checklists are stored in boxes for five years to facilitate long term monitoring and fixing of problems; after five years, they are discarded. The staff also logs all daily activities and times manually in an occurrence book. Ordinary occurrences are recorded using black or blue pen; faults or abnormalities are marked in red. Distinguishing faults using red is helpful to the manager, Mii, as well as visiting auditors in tracing those incidents and what actions were taken to address them.

Whenever Mii prepares his weekly, 3-monthly and 6-monthly reports, he reads through and summarizes the contents of the occurrence book. The reports are typed and e-mailed to the Airport Authority in Rarotonga.

The consultant recommends doing the occurrence book electronically using Excel or a simple database. This solution would provide the following advantages:

- Easier to store
- Saves paper
- Easier to transfer to electronic reports
- Easier searching and filtering vs. flipping through a book

The consultant also noted Mii's difficulty with basic computer tasks, such as creating new folders, and recommends that he acquire some computer training to help him better manage his documents and workflow.

Finally, the consultant took photos and gathered the following information about the Aitutaki Airport that might be of interest to tourists visiting the website:

- Sealed surface runway as opposed to coral

- Lighting system for evening flights
- Visual navigational aids for landing, such as lights and wind direction
- Firefighting capabilities, only found in Aitutaki and Rarotonga

It was agreed between the consultant, Mii, and Ministry of Transport that this information would be better placed on the Airport Authority's website than on the Ministry's website.

The Ports Authority in Aitutaki operates using the following process for each incoming ship:

1. External shipping agency gives Ports the ship manifest.
2. Ports manually calculates the shipping costs of each piece of cargo.
3. Ports e-mails or faxes the calculations to the Ports Authority in Rarotonga.
4. Ports in Rarotonga sends back invoices for each bill of lading, or B/L.
5. Ports in Aitutaki distributes the invoices to importers.
6. Importers pay.

The Ports Authority has been doing all cost calculations manually using a calculator. The consultant recommends using an Excel spreadsheet to do these calculations. With proper setup of product and sum functions, the user can simply enter a weight and Excel will automatically calculate all sub-costs, total them, and add tax, as well as iterate the functions over the weight in each row. This solution saves a lot of time and is easy to e-mail as a file to Rarotonga.

The consultant helped the Ports Authority create this calculations spreadsheet. The consultant also wrote step-by-step documentation for recreating the spreadsheet in case of accidental file corruption or loss.

Like the Airport, the Ports Authority also struggled with simple computer tasks. The consultant taught the staff how to connect a camera to their computer via USB cable, copy the photos from the camera to the computer, and attach photos to an e-mail.

No outstanding information about the Ports Authority in Aitutaki was identified for Ministry of Transport's website.

Task 5. Improve Data Management

Due to time constraints, priority on the other tasks and lack of technical database skills, the student consultant and Ministry were unable to implement any changes to existing database practices. However, the consultant did analyze Harriet's licensing database, consider a possible improvement to its design, and research Excel and Access solutions on the Internet. Refer to *Recommendation 1. Alter Licensing Database Design* for recommended changes.

In addition, the consultant conducted training on basic relational database design, including data types, entities, attributes, relations, data dictionaries, entity-relationship diagrams, and normalization. This training also covered the difference between Excel and Access and how the two applications can be used together. The PowerPoint presentation is attached in *Appendix E. Introduction to Databases*. Three staff members, Oscar, Steve, and Harriet, attended; all said the training gave them a better understanding of and greater interest in databases and Access.

Recommendation 1. Alter Licensing Database Design

After comparing the licensing database's entities and relationships with the receipt information Harriet enters into her liquor revenue Excel spreadsheets, the student consultant determined that a change to the database design could address the issues of both duplicate work and duplicate

data. Specifically, the consultant recommends dividing the receipt-related fields under the license entities into a separate entity. The receipt entity would be linked to the premise and manager licenses using the license IDs as foreign keys. This relationship can be used to access other license information such as the premise name, category and fee amounts. See *Appendix F. Licensing Database Design* for visual examples.

This solution would provide the following advantages:

- Easier to import and export desired revenue information between Access and Excel
- Do not have to maintain multiple copies of basic license information in separate files
- Can maintain all years of receipts in a single database and filter by year

Because of the staff's limited database expertise, this solution would require additional training in Access or external assistance to change the database design.

Recommendation 2. Regularly Test Backups

Although the Ministry of Transport already has a healthy habit of daily and weekly server backups, there has been little to no testing of these backups. The backups have only been used to restore individual files, and the Ministry has never encountered the need to restore large portions of the server. As a result, the staff take for granted that the backups work. This approach is problematic because the Ministry can never know when the server might crash completely, a likely occurrence given the dated hardware and history with problems.

The student consultant recommends adding a scheduled backup test once per month. Because Cobian Backup does not come with testing or verification tools, the process should be done manually. Several online resources on testing backups:

- [Test Your Backup and Restore Process](#): a simple testing process.
- [Testing Backup and Restore: Why It Matters](#): a professional's real experience and recommendations for backup testing in a small company
- [The Tao of Backup](#): an interesting site with information on many aspects of backups, including testing. The consultant recommends reading all the "more information" pages but ignoring any marketing prose on the Veracity software.

Recommendation 3. Log All Hardware and Software Faults

The consultant also highly recommends starting a habit of logging all faults that occur for all Ministry hardware and software. The ongoing process can be as simple as updating an Excel spreadsheet with the date, time and a short description of each occurrence, much like the Aitutaki Airport occurrence book. Maintaining a log will allow the Ministry to monitor and fix recurring issues as well as help external experts such as the ICT Division trace problems when they are brought in for assistance.

Recommendation 4. Designate Small Committee for IT Management and Planning

Most Cook Islands government ministries have a designated IT specialist or department. The Ministry of Transport does not due to its smaller staff size and low funding. Although the Ministry does not require a full time IT specialist to assist with major operations, the lack of expertise and focus puts the Ministry at a disadvantage in technology growth compared to other ministries.

The consultant recommends designating a small committee, perhaps consisting of Aukino, Oscar, and one other interested staff member, to take charge of IT management and planning. Their responsibilities should include making long-term growth plans, determining when it is best to update software and hardware, IT budgeting, and acting as the Ministry of Transport's liaisons to the ICT Division. A planning committee will create more support and sustainability for the increasing role of IT in the Ministry's work.

Recommendation 5. Conduct Regular Workshops to Maintain Skills and Interest in IT

The primary challenge the student consultant encountered was keeping the staff at the Ministry of Transport engaged in IT affairs. For example, the staff acknowledges what needs to be done for the shared server and website but are slow to actually take action. In addition, with Joomla and database training there is a risk of letting the learned skills wane due to lack of practice.

On the other hand, the consultant observed noticeable peaks in interest in IT at specific times in the consulting period. During the 10 weeks, the consultant conducted or assisted with three IT presentations at the Ministry of Transport. The first two were full staff meetings providing updates on the consultant's work. The third was a smaller, focused training session for staff members who work with databases. All three presentations had the positive side effect of sparking new interest and discussion in the mentioned technologies.

The consultant proposes using regular workshops to uphold skills and interest in IT. The workshops can be refreshers on previous training, introductions to new skills, or forums on the current state of IT in the Ministry and what staff members would like to see in the future.

The ICT Division could assist with these workshops and apply them to other government organizations.

About the Consultant

Elizabeth Li is a rising junior at Carnegie Mellon University with majors in Information Systems and Human-Computer Interaction and a minor in Business Administration. After graduation, she hopes to complete a graduate degree and eventually pursue a career in user experience design.

References

Tairea, Aukino. *Ministry of Transport Business Plan 2011-12*.

Appendices available upon request