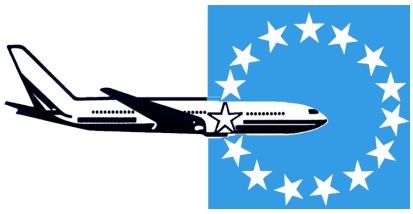

Cook Islands Airport Authority
Final Consulting Report

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Executive Summary

Over the past 10 weeks, I have had the opportunity to work with the Cook Islands Airport Authority's to meet two key goals: (1) building a new web presence and training the team to sustain the website moving forward and (2) designing and building foundations for a Works Order database to track and analyze faults across the Airport facilities.

The Airport Authority is a highly qualified organization that maintains Rarotonga International Airport to stringent international standards despite being located on a relatively small island. As a state-owned but independently operated enterprise, the Airport Authority faces the challenges of relying on its own revenues for operations and airport renovations with little assistance from government funds. The airport has 10 divisions that work together to provide services to over 100,000 passengers a year.

I worked closely with the technical services team in implementing the website and the database. The technical services team consists of 6 individuals that handle an incredible variety of tasks from IT administration to navigation systems repair.

Before I arrived, the Airport Authority had a 4-year old stalled project to build a website. Thus, the majority of my consulting efforts were devoted to building a modern website that would be a suitable for the airport's international presence. I relied on the Joomla content management platform with its existing templates and extensions. It also provided and easy to use administrator panel for sustainable website maintenance. The result was a hosted website that the staff is capable of maintaining in the future.

The final weeks of my work was spent examining their existing Works Order reporting system, which was a manual paper and log book process. I built an Access database that handled the entry and storing the information in a digital format to allow for better monitoring and analysis of the faults that occurred around the airport. The result was a functional Access database with sample reporting features that the team can continue to build upon to meet their desired reporting and monitoring needs.

I. About the Organization

Organization

> *The mission of the Cook Islands Airport Authority is to ensure travelers enjoy their journeys to and from the Cook Islands through proficient, precise, and effective services.*

The Cook Islands Airport Authority is a 115-employee organization charged with managing Rarotonga International Airport. They also provide important services to the 7-employee Aitutaki Airport, which serves as the Cook Island's alternate international terminal. Rarotonga International Airport was opened in January 1975 on a World War II United States military air base. Originally under the management of the New Zealand Ministry of Transport, Rarotonga International Airport became a Cook Islands state-owned-enterprise managed by the newly established Airport Authority in April 1st 1986.

The Airport Authority is self-sustaining in its operations and relies mainly on landing fees, air space fees, and terminal space fees for its revenues. The airport operates on a yearly budget of around $6-7 million. In addition to maintaining flight traffic, the Airport Authority also manages airport services to the strictest international standards. Important capabilities include terminal facilities, security, technical services, fire rescue, and administration.

Rarotonga International Airport is located on the coast of Rarotonga near the edge of the town of Avarua and serves over 100,000 visitors per year as the primary international airport for the Cook Islands. With tourism as a primary industry, the number of visitors has been growing yearly.

Major airline carriers serving the island include Air New Zealand, Air Rarotonga, Virgin Australia, Air Tahiti, and Pacific Blue. Air Rarotonga provides frequent flights between the various islands of the Cook Islands. Air New Zealand provides the majority of the international flights predominantly to New Zealand and Australia as well as flights to the United States.

Technology plays an important role throughout the organization and there are various opportunities involving technology. Technology capabilities are housed within the technical services division. There is a lack of official web presence for the Airport Authority. There is an opportunity to provide official terminal information to travelers and information about the Airport Authority itself. There are some degrees of manual paperwork processing in fault tracking within the organization; some automation could be beneficial for efficiency and improved monitoring.

Facilities

The Airport Authority offices are located in Rarotonga International Airport. A large portion of the Airport Authority is located in offices within the flight control tower. Adjacent buildings house additional terminal services, maintenance, security, and fire rescue offices. Passengers interact directly with the main terminal building, which

includes domestic and international gates, waiting areas, shops, customs, and other passenger related facilities. The airport has over 2,000 meters of runway that allows landing from both directions. The airport has the ability to serve major international scale flights.

The terminal facilities have gone through major updates throughout the last decade including a renovation in 2003 as well as a larger reconstruction project to expand the terminal that was completed in 2010.

In terms of technology, most computer use occurs in the office areas in the flight control tower and adjacent buildings. Navigation systems are use primarily through the runway and control tower areas. Security systems (wands, x-ray) are used primarily in the terminal areas. Radio communications is also available throughout the airport.

Programs

The major activity of the airport authority is to provide landing and takeoff capabilities to airplanes arriving at and departing from the Cook Islands. Technology forms the backbone of these and many other services managed by the airport authority and its departments.

The major departments within the airport authority that allow the airport to operate are:

- Management – Lead the managing and direction of the Airport Authority.
- Air Traffic Services – Provide control, approach control, and aerodrome/area flight information services in the Cook Sector during hours of watch.
- Administration and Finance – Ensure sound financial management practices and administrative obligations.
- Commercial Operations and Quality Assurance Services – Manage retail, property, and aeronautical commercial activities; systems architecture for both international and domestic airports; services to provide confidence in suitability of operational services
- Airport Security Services – Promote and enforce safety to aviation security by the applications of security measures
- Rescue Fire Services – Maintain operational readiness to international standards to save lives of occupants from fire and radiant heat in an aircraft incident as well as protect the lives and properties of the community at the risks of fire and other emergencies.
- Maintenance Services – Ensure that equipment, electrical, and buildings are maintained to international standards
- Terminal Services – Provide safe and confortable environment for all airport users and agencies through facilities/terminal maintenance, cleaning services, commercial services, and flora and fauna maintenance.

- Technical Services – Provide technical services to all divisions of the airport authority ranging from IT administration and support to flight traffic equipment and radio maintenance.
- Aitutaki Airport – Manage Aitutaki Airport with help from Rarotonga Airport staff.

Staff

There are 115 employees of the Airport Authority across the major departments. Each of the departments has different requirements for their roles and carries out various responsibilities. The larger departments include Airport Security and Rescue Fire Services with over 25 employees each. The remaining departments are around 10 employees or less. Each department has its own training regimen appropriate for its roles.

There are 6 members of the technical services team. This team provides all major and minor technical services across all departments and facilities. The team has a variety of specializations from IT administration to air traffic and radio systems. IT Staff handles support and hardware. They do not actively build software for use but provide support for installed products.

The office-oriented staff housed in the offices outside the terminal use computers on a more regular basis when compared to terminal/runway-oriented departments like rescue fire and security. Applications that are used on a regular basis include word processing, e-mail, PowerPoint, Internet browser, and more specialized office programs.

Technology Infrastructure

Below is an accounting of the major aspects of the Airport Authority's technical infrastructure:

- Hardware: Information Technology (Laptops and Desktop PCs), Communications (paging systems), Navigation (aerials, Air Traffic Control equipment), Miscellaneous (x-rays, hand wands, walkthroughs, portable radios).
- Network: Cisco switches for network connectivity. 4 Servers across the Airport Authority covering file sharing, email, etc.
- Internet Connection: Wi-Fi and Ethernet connectivity throughout the airport offices. Pay for use Wi-Fi in passenger accessible areas.
- Operating Systems: Most laptops and desktops are on Windows XP or Windows 7. The servers run Windows Server 2003.
- Peripherals: Fax, scanners, printers, projectors.

- Software: Windows, MS Office, AutoCad (for project officers), Attache (accounting program), and X-ray tutor (security training software). No real custom build solutions.

The Airport Authority is continuing to plan and upgrade technology infrastructure. Future plans include surveillance cameras and upgrading air navigation systems. Cost of upgrading is always a concern regarding technology infrastructure, but the Airport Authority does not compromise safety.

Technology Management

The 6 member Technical Services team has responsibility for the managing significant technology at the Airport Authority including infrastructure and maintenance. The team is split into IT administrative/support services and technical equipment services.

The technical services team is responsible for procurement and installation as well as problem solving. Issues are reported to technical services via email, phone calls, drop-ins, and paper forms. Technical services uses pen and paper logbooks to track existing issues and work completed. Technical challenges can be escalated to Airways and Radiola companies in New Zealand for assistance.

Servers and e-mail systems are backed up and managed by the technical services team. The IT Admin sends out major software updates through the server. NOD32 antivirus software provides automatic virus protection and updates. Current hardware purchases often come pre-loaded with existing software. There is a push toward more software standardization across the organization.

Technology Planning

The manager for the Technical Services team is responsible for budgeting and planning the technology infrastructure for the airport authority on a yearly basis. The manager does more navigation systems planning while the IT Admin does IT based planning. The budget cycle ends in June and yearly planning in done on the same cycle. The budget for IT can range from $1,500 to $15,000 and the budget for the navigation systems can range much higher from the thousands to the millions for advanced equipment.

The Airport Authority operates on a 10-20 year capital replacement plan and technology capital (particularly navigation) expenditures fall under this cycle. Computing equipment can be replaced in shorter cycles if they malfunction as is sometimes the case. Budgeting and planning for maintenance and upgrades meets auditing and international standards. Sometimes, technology services division is not considered a priority division and upgrades on systems can be difficult. However, safety is never compromised. Rather, maintenance and support becomes more difficult as parts age and support becomes scarce.

Internal Communication

The primary means of exchanging information is via e-mail and phone calls. Files can be easily shared using shared file directories on the Airport Authority servers. There are also paging systems and portable radio systems for communication. The airport authority has its own email accounts. The staff has the ability to access the Internet and webmail from their workstations.

The airport authority does not currently have an official website. There are also some paper forms that are used that could be automated. Also, there is a 10 MB limit on e-mails through the service provider that is sometimes an issue when people try to send mass e-mails but it is not a major concern.

Information Management

Information is managed on Window 2003 Servers within the organization. A shared file system is available and users are encouraged to manage their information on the server. Currently, each department is allowed to manage their own information needs on their computers and the servers. The IT Admin provides assistance and guidance on best practices and has recently moved to take a more hands on role in information management to prevent personal use of the servers.

There are 4 major databases at the Airport Authority. The Attaché accounting software for accounting and retirement fund purposes uses 2 databases. Rescue fire service uses a database to track time sheets. Lastly, air traffic control uses a database to track plane movement.

Communication systems and information are also critical for the Airport to operate because airlines need information on navigation to use the airport. Within the technical services team, information on work orders is stored in a paper logbook. They want to digitize this process.

Business Systems

The major business system is Attaché, a New Zealand based accounting software that provides most administration, accounting, and payroll functions. The system is updated every two years and the vendor provides support. There are issues around customization that the vendor helps the Airport Authority administration work around.

II. Scope of Work

A. Airport Authority Official Web Presence

The Airport Authority has an opportunity to improve their information flow to the travelers and other interested parties that currently use the Airport Authority's facilities. The Airport Authority launched an initiative approximately 4 years ago to build and launch an official Rarotonga International Airport web presence. The effort has been picked up and handed over a couple times but has yet to be completed.

Virtually all the comparable international airports have dedicated web sites that provide travelers with key airport information. Without a website, travelers must call for help which can cost money and service agents are unavailable at certain hours of the day. Furthermore, if in Rarotonga, phone access may not be readily available.

An information website improves the customer experience while traveling through the Cook Islands. It will help the Airport Authority further its mission of providing and enjoyable journey to and from the Cook Islands.

Currently, travelers must rely on third party information or piece together travel rules from various Cook Island ministry websites. This is a poor alternative because the airport authority lacks control over third party actions and content. And as the airport grows, this may not be a sustainable way to keep content about the Airport Authority up to date.

Building and maintaining their own website will allow the Airport Authority the most control over improving the Airport experience in a way that mirrors today's standards.

Expected Outcomes

The website development project will take in multiple phases.

- Initial research and requirements gathering
- Design and prototyping
- Implementation
- Content gathering and uploading
- Training, testing, maintenance, and updates

Scope of Outcomes: The result will be a fully functional and visibly appealing web presence for the traveler information and corporate side of the airport authority. Traveler information and corporate page Joomla templates will be established with training provided to fill in content.

Additional Impacts

The goal is to transition and train the Airport Authority to administer the website once completed and have full control over content and relevant updates. This will allow passengers to have the most up to date travel information. In addition, local businesses will also be able to advertise on the website and inquire about information related to terminal space rentals.

Feasibility

The proposed project is highly feasible given the agreed upon scope and time frame. The partner is passionate about getting this project up and running during the time frame and is fully supportive with resources and needed information. The consultant is

proficient in designing the website and does not foresee major obstacles in implementation aside from occasional limitations of Joomla to the proposed designs. Training is planned to allow the Airport Authority to use Joomla to manage website content with relative ease post-project.

B. Airport Authority Works Order Form Database

The Airport Authority Technical Services Department currently uses manual processes to track the majority of their work orders. This includes bugs, technical issues, repairs, etc. that need to be completed. Typically these orders come in via e-mail, phone call, or paper form and are tracked in paper logbooks. While the paper logbooks make it difficult to gauge an exact historical rate, the Technical Services team typically received at least one issue a day but this number is variable.

Given that there are multiple logbooks, it is a challenge to effectively analyze past and currently open work orders. The Airport Authority lacks additional information that could be gained from effectively analyzing and monitoring how often issues arise and how long repairs take across facilities. The airport could understand the efficiency of their various divisions in terms of downtime of the equipment each division uses. If downtime increased by a certain threshold, it could send a signal that replacement or improvements were required.

The Airport Authority would like to deploy a database to digitize and monitor the existing manual process for submitting Works Order forms. This will benefit the technical services team and the Airport Authority as they work to improve efficiency.

Expected Outcomes

The database development project will take in multiple phases.

- Initial research and requirements gathering
- Database design (Custom solutions were researched and found not easily suitable for the Airport's Needs)
- Implementation (with Staff Trainee)
- Training, testing, maintenance, and updates
- Future database additions

Scope of Outcomes: The result will be a shared database that automates the word order submission process. It will cover works order only. The database will be built in Access as the technical services team already has experience here. Should database implementation become infeasible given the timeframe, we will reduce scope to database design and implementation planning.

Additional Impacts

Once this database is complete, not only will the process be less error-prone (current error-rates are unknown but important because logbooks are often used during audits), but also management will be able to query for monthly work orders and measure reliable and accessibility across the various facilities. This will allow continuous improvements to airport efficiency.

Feasibility

The proposed project is feasible if the scope is kept limited. There are proposed plans to also automate additional areas such as Inventory, Assets, and Supplier forms. Given the timeframe, all may not be feasible. The goal is for one database to be implemented and then provide training to allow the staff to continue building the desired databases.

The partner is particularly passionate about the end analysis that the database will allow and has dedicated an employee to learning and running the database post-project.

II. Outcomes and Recommendations

A. Airport Authority Official Web Presence

Outcomes

Developing the airport website consisted of a number of steps. I have separated them out into discount tasks below with a description of each.

A1. Airport Website Research

We researched comparable airports and their website functionalities as well as gathered the Airport Authority's requirements in order to understand the features to build into the website. We also examined Joomla's capabilities to determine feasable features. By going through this task together with the Staff Trainee, we came to a shared understanding of our design goals while also learning a lot of airport website design.

A2. Prototyping and Design

Based on our research, we drafted layouts on paper and then developed high fidelity prototypes in photoshop. These designs were guides to development. Prototypes were shared with the team for approval and feedback. The ultimate look of the website was shaped by the capabilities of Joomla.

A3. Gather and Develop Content

In order to fill the website with content, we gathered information from various sources from inside the airport, the old website, and online. We also created content such as the airport map and photos for various parts of the website.

A4. Develop Joomla Website

Use Joomla CMS to build the Airport Authority website. By using templates and extensions, we were able to add features and get the site up and running relatively smoothly.

A5. Host Website

Host website at www.airportcookislands.co.ck through the ICT office. Backup and server maintenance will be handled by Mitch with the ICT. This option is preferable to hosting the website inhouse because the ICT has already existing capabilities in web hosting as it manager hosting for other ministries.

A6. Website Maintenance Manual

Create website maintenance manual covering all major website administration tasks with step by step instructions to using the Joomla administrator panel. This is a key document for sustainability that can be used to transition maintenance across various staff members.

A7. Training for Administration

Provides training tasks for IT Trainee on staff to ensure capabilities including webpage updates, changing photos, editing links, etc. These tasks ensure the IT Trainee is capable of performing important maintenance tasks with the Joomla Adminsitrative panel.

A8. Alternative Domains

Researched possibility of alternative domain names. Receieved access from SITA for the .aero domain. The Staff can work with Mitch to get .aero domain to direct to the existing server.

Recommendations

While the initial website has been completed, continued maintenane and updates must be done in order to keep website up to date and relevant to visitors.

- Air Traffic Control must be trained in uploading flight status information as soon as possible. I recommend the IT Trainee complete this task initially

before training the ATC staff. IT Trainee must ensure flight status information is updated daily.

- Ad functionally is enabled as requested by the CEO. Detailed steps to adding client ads are provided in the manual. I suggest working with Commercial Operations to identify potential clients and implement a test round of ads for free to gauge performance (hits/clicks). Then consider pricing ads in a affordable manner to increase airport revenue.
- The .aero domain has been approved by SITA. If the Airport Authority wants to use a .aero domain (for example, Cookislands.aero), they should contact SITA and Mitch to understand how to redirect the exisiting www.airportcookislands.co.ck website to the .aero domain.
- Front page content (particualarly the slideshow) should be updated to reflect any new content whenever it occurs.

B. Airport Authority Works Order Form Database

Outcomes

We developed a preliminary Works Order Forms database that allows all the key functions related to Log books to be completed. I have separated them out into discount tasks below with a description of each.

B1. Research Existing Solutions

B2. Database Design

Created Access database design for works order and basic equipments database in Access containing field required for Works Order processing. The entities and fields were based on existing paper forms and input from the staff.

B3. Data Entry Form Interfaces

Created interface and forms for the Access Works Orders database. The forms allow data entry, viewing records, sorting and filtering, and monitoring open works orders. Default fields were employed where possible.

B4. Work Done Tracking

Create interface and forms to not only track initial Works Order form but also subsequent work and comments done on specific issue. Works Done allows staff to track time spent on specific issue and comment on the ongoing issue.

B5. Time-Period Summary Reporting

Created reporting functionality based on works order database. Reporting allows users to select date range or other criteria and pull a printable summary of works orders in the database as well information on work done and down time on issues.

Recommendations

The Access Database does all key functions for inputting and reviewing existing works orders. There is potential to increase the reporting and monitoring potential through reports.

- The equipment table is currently populated by sample data. I recommend going through and adding all existing equipment to the table. The table can be further extended with additional fields if desired to store additional details about each equipment.
- Create additional reports as needed by the technical services team and management to meet their needs. Access has robust report creating functionalities. Look at the sample reports I have created to see how it can be done. Potential new report ideas include: faults by facility, time spent by facility/equipment, downtime by facility/equipment, etc.