

Remote Projects: bringing their diaspora home

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ABSTRACT

This paper discusses the development of a capstone project - creating a drivers' license system for the Tongan Police Department. A SoDIS analysis was carried out to explore ethical concerns posed by the project. Issues raised through the SoDIS analysis are used to consider the context of the project, including the direction of economic development in the Pacific, and the current evolution of democratic processes in Tonga.

1. INTRODUCTION

Living in the South Pacific provides us with many opportunities for partnerships and projects with our near neighbours. Through the summer of 2004/05 a student group from Otago Polytechnic has been working with the Police Department in Tonga, creating a database system to manage drivers' licensing in the island group. The opportunity to undertake a capstone project in Tonga came about through the endeavours of a Tongan student in the Bachelor of Information Technology. Developing a drivers' licensing system for the Tongan Police Force was a challenging project from the outset, and posed practical and ethical issues for the group. These issues included dealing with a remote client, the exacting requirements of a legal testing system and the challenge of aligning the existing system with driver testing in New Zealand.

2. BACKGROUND

The tiny archipelago of Tonga is one of less than a dozen absolute monarchies remaining in the world. The ruler of Tonga, King Taufa'ahau Tupou IV, and his family live well and are generally revered by the population. However a pro-democracy movement has recently emerged, promoting better representation in parliament and improved accountability. In the 2002 elections,

the pro-democracy party (Tonga Human Rights and Democracy Movement) gained seven of the nine parliamentary seats allocated to commoners (the remaining 21 seats are filled by nine Nobles' Representatives and ten Cabinet Ministers appointed by the King). James (2002) suggests that this success is not viewed as an imminent threat to the monarchy, but such results reflect an "increasing disquiet amongst Tongans" due to "allegations of corruption, lack of accountability, and government misspending" by the Royal family (Lee, 2004).

Almost half of Tonga's population lives off shore, primarily in New Zealand, Australia and in the United States. Remittances sent home from these family members provide a significant proportion of Tonga's annual income, with tourism providing the second-largest source of hard currency earnings. The shift to an export driven monoculture economy has disrupted the traditional agrarian lifestyle, increasing dependence on aid packages and as Storey & Murray (2001) assert, "exacerbating the already considerable economic and environmental vulnerability of small island nations".

3. THE PROJECT

A Tongan third year student at Otago Polytechnic had observed problems with the Tongan drivers' licence system long before he came to Dunedin to complete his Bachelor of Information Technology. The current licensing system is paper based, with inevitable inefficiencies. Working with their client, Tongan Traffic Department (a section of the Tongan Ministry of Police), the student group have spent the past 10 months working towards creating a new computerised system. The completed product stores driver details, produces printed licence cards, and offers





Figure 1: Chad Roulston, Siasoi Vaka and Prabair Choudry

computer-based driver theory tests. The new system "will bring Tonga into line with New Zealand licensing standards, which is a quantum-leap for them from their current system" (Russell Hynd, personal communication).

Using a software development life cycle methodology, the students' first step was to conduct a thorough analysis of the existing system. Due to the remote location of the client and the existing system, as much research as possible was completed during occasional visits to Tonga. This has been an expensive exercise for the student, unfortunately funding was not available to finance these trips. Back in Dunedin, contact with the client was maintained through frequent phone calls and emails.

Issues with the existing system included:

1. Illegally issued drivers' licences – it is common practice for Tongans to obtain licences through a friend or family link, without recourse to testing or even being physically present in Tonga. This is extremely convenient for Tongans resident overseas who need to renew their Tongan licences annually.

2. Invalid use of illegally issued drivers licences overseas – A Tongan licence is recognised in New Zealand and can be used to gain an International Drivers' Permit in many countries. It could also be used as identification in banks and stores.

3. Issuing of multiple drivers licences if existing licence is lost – is problematic due to the paper based system. A driver could have multiple licence numbers issued to them.

4. Licencing is inefficient, requiring days or weeks to process.

5. Lack of an accessible, centralised location for processing and recording licence information. There are 680 km (184km paved) of roads in Tonga, spread over dozens of islands. Policing

and administering the system poses challenges in this environment.

6. Security of system – the paper files are not adequately secured against loss or unauthorised access.

4. SODIS ANALYSIS

As an adjunct to the group's work, a SoDIS analysis was carried out as a class exercise for a second year Software Engineering class (SE205). SoDIS (D. Gotterbarn, Clear, T. , Kwan, C., 2004) is a process, embedded in the SoDIS Project Auditor tool, designed to identify risks in a software engineering project through a rigorous analysis of the impact on stakeholders of the development and use of the final product. It primarily addresses ethical issues but in the process wider concerns are often identified.

An important initial step in the SoDIS analysis was the identification of stakeholders – those whose lives could be directly or indirectly affected by the project development. The following stakeholders were identified; the list growing during the exercise as the SE205 students gradually extended their understanding of the stakeholder concept.

- Drivers
- Ministry of Police
- Tongan Traffic Department
- Tongan Community
- Banks
- Police Officers
- Student project group
- NZ Government
- King of Tonga
- Pigs and chickens

The pigs and chickens were added on the insistence of the students, recognising the vulnerability of livestock that is often seen wandering on Tongan roads (and possible impact on the vehicle users in the event of a collision).

4.1 Requirements

The third year project group supplied a list of high level functional requirements, determined from their initial client interview and research.

1. Issue Photo ID license cards which uniquely identify drivers
 - a. Require valid identification on application
2. Improve speed of processing of licences
 - a. Allow single location, same day process-

ing as soon as driving test is passed

3. Administrative testing of drivers
 - a. Generate theory tests
 - b. Mark tests
 - c. Store test results
4. Notify test renewals
5. Allow single location storage of data.
 - a. Allow data to be accessible through Traffic Dept anywhere in Tonga.
6. Replace lost licences without duplication.
7. Provide a secure process for the production and administration of licences.
8. Allow internal tracking of file accesses.

Twenty-eight students, in groups of three or four, carried out the SoDIS analysis using the SPA tool. Each group recorded any concerns and generated a SoDIS Impact Statement, then presented their issues back to the group. Data was collected and collated.

On analysis, it was found that the students had identified a remarkable fifty separate ethical concerns with this project development (see below). Each group had separately identified at least six concerns, very few of which were duplicated by other groups. As Gotterbarn, Clear and Kwan (2004) have noted, using SoDIS in groups encourages synergistic communication and produces better outcomes than could be achieved by a sole practitioner. It was useful at this point to apply a “cluster analysis”, as described by (Gotterbarn and Clear, 2004). The purpose of this was “to provide high level abstractions used to further SoDIS analysis and to provide high level risk categories that developers can use in reviewing their projects.” (Gotterbarn *et al.*, 2004) As a result, the concerns were categorised into manageable groupings, such as new requirements, cost implications, social/cultural issues etc.

5. DISCUSSION

Some concerns were predictable from the initial discussion of issues, such as the need to establish procedures for data access, and the cost of implementing the system to remote island locations. Other concerns suggested some deeper probing had taken place during the SoDIS analysis. Students identified the need for public education on the changed licensing system and in class discussion raised the issue of the social impact of imposing “Western-style” standards of administration on a small Pacific Island nation.

What are the benefits to Tongan society if the general public were content with the existing system? Should we assume the ideals of efficiency and modernism as practiced in “developed” nations apply? These concerns mirror those expressed by Storey and Murray (2001) who question the orthodox developmental reforms sweeping across Oceania. For those members of Tongan society who are not “plugged in” to the new aid supported capital based networks, few benefits are delivered. Care needs to be taken that a marginalized group is not created in an effort to bring Tonga into the 21st century.

Similarly, the SE205 students viewed practices in the existing system, such as the “mates rates” approach, as corrupt. They discussed the level of acceptance of this behaviour in Tongan culture. How common are these practices in wider Tongan society, and to what extent could they be eliminated with a new drivers’ licence system? Other authors have discussed the level of corruption evident at a high level in Tonga’s hierarchical society.

For example, there is a degree of corruption in middle-level management, cronyism in the matter of awarding government contracts, the misuse or misappropriation of government funds, machinery, building materials, and the like, which they resent but which they feel powerless to address. (James, 2002)

It is difficult to envisage a wholly honest police force managing the drivers licensing system while the King and his family are indulging in such schemes as the illegal selling of Tongan passports and “flag of convenience” international ship registrations, mismanaging the Tonga Trust Fund and banning dissident newspapers (Lee, 2004)

Another concern raised by the class was the question of the allocation of resources across the country. Is the licensing system the best use of public funding in Tonga? Other social needs may be of higher priority, e.g., clean water supplies on outer islands or the education system. An Asian Development Bank report entitled “Priorities of the People - Hardship in Tonga” outlines a grim picture of poor Tongan communities affected by unemployment and falling currency value (ADB, 2004). The priorities of the people as identified in this report were firstly the need to create more income opportunities, and secondly improved access to basic services such as water,

health, education and roads (ADB, 2004). On the positive side, the importance of family and community support and initiatives were also highlighted. This issue provoked some heated exchanges as some students felt this discussion was not appropriate; who should decide how Tongan monies are spent? Certainly the project group was not in a position to suggest that the Government's funding be redirected. The equitable allocation of aid is widely debated in many forums, and this discussion demonstrated clearly the range of issues that could be brought to the fore by the SoDIS process. It was important to clarify to the students that their role was primarily the identification of possible ethical concerns, intended to be brought to the attention of the client. The results of the analysis and the discussion were passed on to project group for inclusion in their development process. The group noted that they had already identified some, but not all of the 50 concerns. A further SoDIS analysis was then carried out by the project group, focusing on the relevant clusters.

This exercise provided the class with a remarkable exploration of the possible ethical issues that could arise from a relatively small project. The outcome for the class was a good understanding of the importance of ethics in software development and an appreciation of the value of the SODIS process.

6. CONCLUSION

“Tonga is a traditional society in transition” (ADB, 2004). The traditional land tenure system, currently enshrined in a law that requires that all men over the age of 16 are allocated an 8.25 acre plot of land, can no longer meet the needs of a growing nation, and emigration losses are contributing to an aging population. Nevertheless, among the Tongan people, a strong sense of family prevails, education and social structures are sound and despite claims by the emerging democratic party, there is no clear mandate for major social reform. What Tongans do want “is greater accountability and transparency in government” (James, 2002), a process which could be well served by introducing an effective information technology solution for their drivers licensing system. One of the core objectives of the Asian Development Bank's Pacific Strategy for the New Millennium is “continuing support for economic growth, good governance, and

public sector reform” (ADB, 2004). Under the economic guidance of the ADB, the Tongan Government has made a commitment to providing “an efficient and effective public sector.” There is talk of extending the drivers license system to include an electronic election system (but that is another ethical discussion).

Lee (2004) describes the importance of involving younger Tongan generations “in the process of nation building through transnational engagements.” It is increasingly difficult for “transnational” Tongans to maintain bonds with their homeland, as they are not able to vote and their traditional land ownership is at risk while they remain outside the country. There is evidence that the younger Tongan diaspora are less likely to send remittances home, a trend that will have a devastating effect on the Tongan economy. One solution outlined by Lee (2004) is for host governments to support young Tongan transnationals in their educational endeavours, and to maintain an involvement with Tonga. Lee (2004) suggests, “anything that enhances their sense of belonging to the ‘nation’ can only serve to encourage their support of kin and institutions within the state”. This project has provided a stunning example of one way that a Tongan student has been able to contribute to his home, and to feel that his time in New Zealand has been well spent.

REFERENCES

- ADB. (2004, August 2004). Country strategy and program update (2005-2006) Tonga. Retrieved 10 May, 2005, from <http://www.adb.org/Documents/CSPs/TON/2004/ton-cspu-2005-2006.pdf>
- Gotterbarn, D., Clear, T. (2004). Using SoDIS™ as a risk analysis process: a teaching perspective. In Proceedings of the sixth conference on Australian computing education - Volume 30 (pp. 83-90). Dunedin, New Zealand: Australian Computer Society, Inc.
- Gotterbarn, D., Clear, T., Kwan, C. (2004). Managing Software Requirements Risks with Software Development Impact Statements. In S. Mann (Ed.), Proceedings of National Advisory Committee on Computing Qualifications (pp. 70-77). Christchurch: NACCQ.
- James, K. (2002). The Recent Elections in Tonga: Democratic Supporters Win but Does Democracy Follow? *Journal of Pacific History*, vol. 37(no. 3), 313-322.
- Lee, H. (2004). ‘Second generation’ Tongan transnationalism: Hope for the future? *Asia Pacific Viewpoint*, Vol. 45(No. 2), 235 – 254.
- Storey, D., & Murray, W. E. (2001). Dilemmas of development in Oceania: the political economy of the Tongan agro-export sector. *Geographical Journal*, 167(4), 291.