

Electronic government: Evaluating the status of service usage in Papua New Guinea

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Abstract

Advances in information and communications, and the various Internet technologies are enabling government agencies to enhance service delivery allowing users to access available services online. Agencies and users in Papua New Guinea are striving to use these technologies to facilitate e-government service delivery and accessibility, respectively, but the progress made so far is yet to be adequately researched. This paper reports on the state of e-government service usage resulting from a user survey and e-government model. Survey results were compared with those predicted by the model to gauge progress. The findings indicate that service usage is operating at only a basic level, which perhaps is all that could be reasonably expected given the state of e-government development.

Keywords: connected services, e-government, e-government model, emerging information services, enhanced information services, transactional services, United Nations

Introduction

Government agencies are leveraging the advances in the information and communication (ICT) and various Internet technologies to improve service delivery and delivery (Huang, 2006), which is here referred to as electronic government (e-government). Agencies such as departments and statutory bodies in Papua New Guinea (PNG) are striving to attain effective service delivery using these technologies (Daniel, 2016), to assist in achieving some of the aims of the government (PNG Government, 2010). Users (especially citizens) are also striving to access these services using these technologies. However, the progress made so far is yet to be adequately researched, a gap this paper seeks to address.

The paper will discuss the United Nations (UN) model and present findings based on a user survey. By using the survey and model, it will describe how survey responses were analysed to evaluate progress of e-government service usage (accessibility). E-government services (simply services) refer to information (e.g. contact details, services provided, plans and policies), online applications (e.g. e-passport and e-registration) and facilities (e.g. polling, feedback, forums and social media) that connect users with agencies (United Nations, 2014). Further, the paper will report on the findings and provide some understanding of the progress made so far, which could aid further planning, adoption and evaluation with respect to PNG, the region and rest of the world (Daniel, 2016). Thus, an original contribution will be provided to e-government

research in PNG particularly in view of stated aims of the government development plans.

Development plans

According to the PNG development plans, the government aims to provide modern and affordable ICT infrastructure that reaches all parts of the country and access to services such as e-passport and various online applications and services (PNG Government, 2010). These aims could conceivably be achieved with proper planning, implementation and use of services, which the government plans to fully adopt by 2030. Agencies are attempting to adopt e-government to improve service delivery and accessibility as stated in these plans. However, there appears to be a lack of research on evaluating the progress made so far, and more specifically no research that has focussed on examining the state of service usage in PNG and other Pacific island countries. Prior to further discussion, a description of Internet access is needed to provide some context.

Internet access

The last decade has seen considerable development in the ICT infrastructure in PNG, with deregulation of the sector opening the market to new entrants such as the Irish company Digicel (Cave, 2012; Logan, 2012). In 2007, Digicel started rolling out its mobile network connecting many parts of PNG (Watson, 2011), making Internet services available to previously unconnected users. This led to competition between major providers (e.g. Digicel and Bmobile) causing a decrease in user access costs (Suwamaru, 2013). Despite these developments, Internet penetration is still low compared to other countries (National Research Institute, 2016) and mainly accessed by young, educated elites in urban areas (Logan, 2012).

Many users and agencies do not have access to affordable and reliable Internet connectivity, which is important to have readily accessible websites. Many live in rural areas where there is lack of electricity and network services, and would unlikely be able to access the Internet (Watson, 2011). Although Internet connection is available in other areas, usage is very low due to high prices charged by service providers (National Research Institute, 2016).

Those who do have access may be mainly accessing websites through mobile phones, tablets or computers at their workplaces or home. There is anecdotal evidence to suggest that even at workplaces, many are given limited amount of data transfer and access time. Internet access alone cannot ensure successful adoption. A model is required to guide evaluation of implementation and use, which will be here considered in terms of the UN model.

UN model

The UN conducts a survey every two years to assess the state of e-government service development of member countries including PNG using its four stage model (Figure 1) which is the chosen model used here to examine the state of service usage in PNG based on user survey responses.

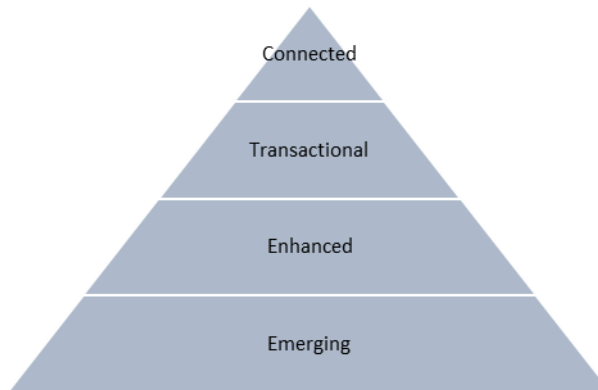


Figure 1: UN model – used to measure the state of service usage.
Adopted from United Nations (2014, p. 195)

The first stage comprises of emerging information (simple one-way services) services such as policies, laws, regulations, relevant documentation and types of services offered as well as links to ministries, departments, other branches of government, and archived information, which could be accessed from agencies' websites (United Nations, 2014).

The next stage comprises of enhanced information (improved one-way or simple two-way) services such as downloadable forms (to be completed and submitted manually), search facility (for locating information such as archives), contact forms (to be completed electronically for further inquiries), multi-language support and multimedia (audio and video) capabilities for relevant information are made available.

The third stage comprises of transactional (advanced two-way) services such as financial (e.g. paying traffic fines) and non-financial (e.g. e-passport) and other online applications and services. The connected stage comprises of facilities that connect agencies and users, and other e-services that cut across agencies in a seamless manner. Such services create an environment that empowers users to be active in government activities. Further, electronic participation services facilitate and encourage user-engagement in the government decision-making process in areas such as public policy. The model is used with a user survey, which will now be discussed.

Data collection and analysis of surveys

Two survey methods (paper and online) were employed to collect service usage data in 2016. Using convenience sampling, paper survey forms were distributed and collected from those who could reasonably be expected to access agencies' websites. As identified by research in other developing countries (Al-Shafi, 2009; Almahroqi, 2012; AlShihi, 2006), these could include staff and students from academic institutions, employees in the public (e.g. agencies) and private sectors (e.g. telecommunication companies and financial institutions), and those who are self-employed. These groups could reasonably be expected to possess the knowledge, skills, experiences or

resources required to access these services, and be in a better position to provide relevant information and better judgement concerning the service usage. Fifty-six paper forms were distributed and collected from part-time students of Divine Word University (Madang and Port Moresby campuses), working in various organisations who agreed to participate in the research when requested.

Self-selection sampling was used for the online survey, which allowed participants to choose themselves to participate in the research (Saunders, Lewis, & Thornhill, 2007). Although it is not considered as a representative sampling strategy, the decision to include it was situated in the context of the research goal (Orgad, 2009) to access those who are often using Web 2.0 platforms to discuss ICT issues and could be expected to access services online. Secondly, those who could not complete the paper survey had the opportunity to participate online. The link was posted on Facebook and LinkedIn sites with open invitations for participation; thereby collecting forty-nine responses.

From 105 completed forms, 93 were included in the analysis with those excluded not accessing government websites. Survey data were analysed using exploratory data analysis (e.g. counting the number of times each service was accessed), which will now be discussed, commencing with demographics.

Demographics

Gender and age

Of the 93 survey respondents, there were more males than females (Figure 2) and tended to be young and educated (Figure 3) elites in urban areas (Logan, 2012).

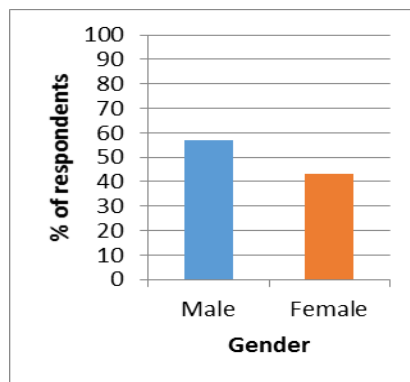


Figure 2: Respondents' gender

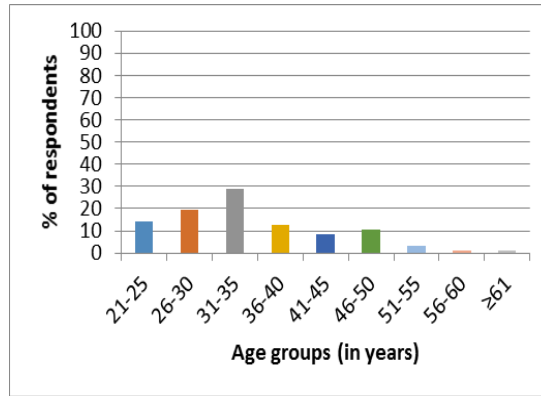


Figure 3: Respondents' age

Education and employment

More respondents had degree qualifications (Figure 4) and tended to be working with government and private organisations (Figure 5). They could reasonably be expected to have the Internet knowledge, skills, experience or resources required to access services.

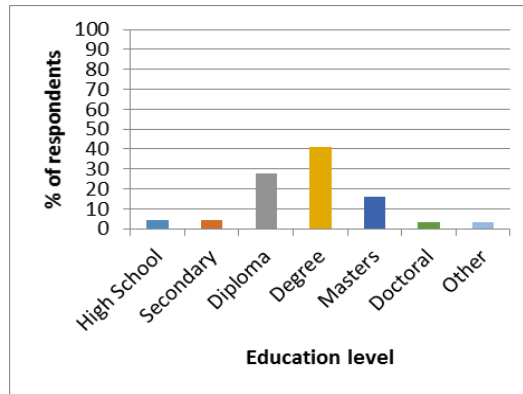


Figure 4: Respondents' educational level

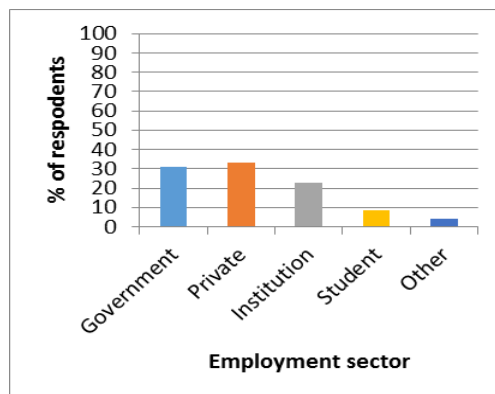


Figure 5: Respondents' employment sector

Internet access

A quite substantial proportion (67%) of the respondents accessed the Internet on a daily basis (Figure 6) probably mainly for work, email or other purposes. A substantial proportion (86%) accessed using computers and mobile phones while a few used tablets (Figure 7).

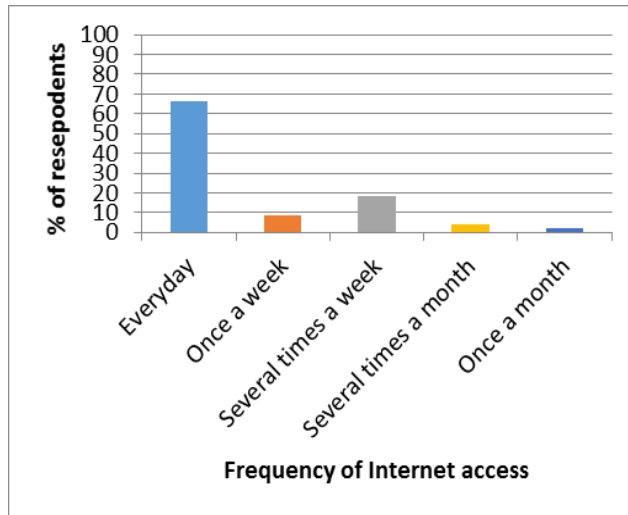


Figure 6: Respondents' frequency of Internet usage

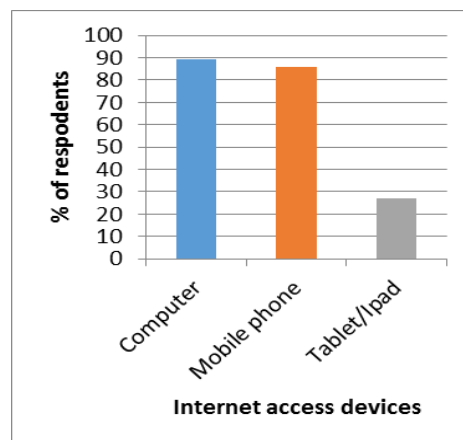


Figure 7: Devices used for Internet access

Frequency of websites access

The respondents were provided with a list of available government websites and asked to select those that they accessed. Websites for the Investment Promotion Authority and Internal Revenue Commission were accessed more than other websites. Most of the respondents (35%) visited government websites once a month (Figure 8) showing less frequent access, probably

because the quality of the websites was low or most were not updated regularly to encourage more frequent access.

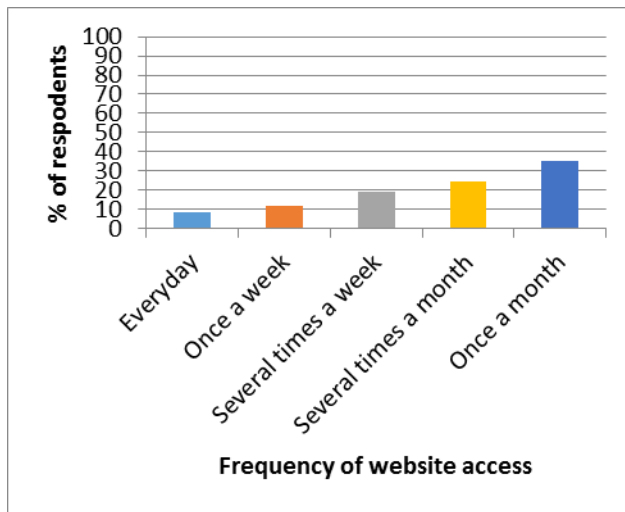


Figure 8: Respondent's frequency of website usage

Results of service usage

Use of emerging information services

A reasonably substantial proportion (62%) of the respondents accessed government documents, and about a half accessed news and events, information about provided services and contact details while a third accessed vision/mission statements (Figure 9). By contrast, fewer respondents accessed organisational structure, links to other sites, FAQs, employment and other information.

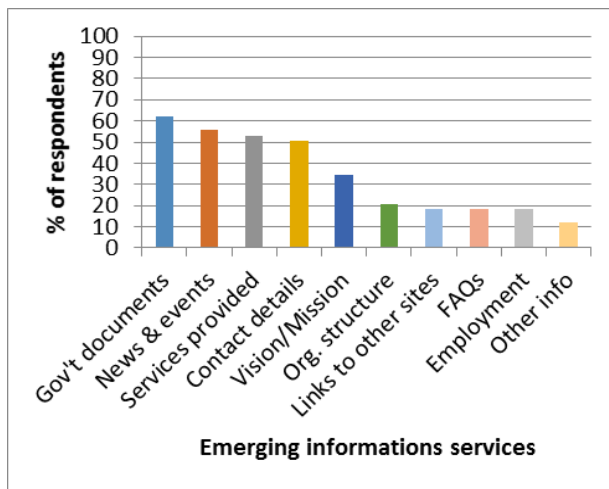


Figure 9: % of respondents that accessed simple one-way informational services.

Use of enhanced information services

A fairly substantial proportion (74%) accessed downloadable forms while a fifth used search facilities, contact form and email addresses (Figure 10). By contrast, fewer respondents utilised help/support, sitemap, multimedia or other information services while none utilised multi-language capabilities.

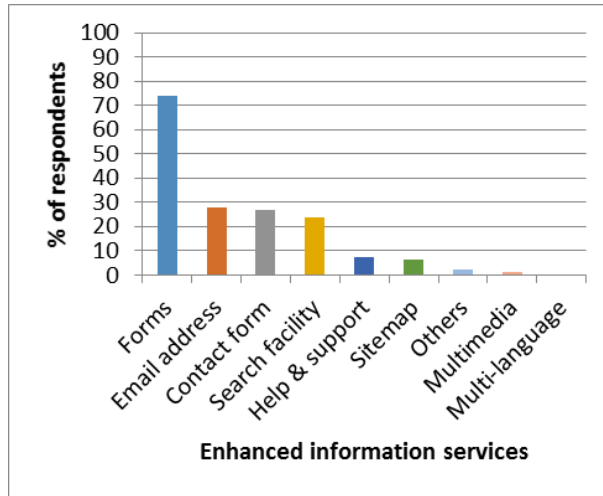


Figure 10: % of respondents that accessed improved one-way and simple two-way information services.

Use of transactional services

Less than a fifth of the respondents accessed non-financial (17%) while none accessed financial services (Figure 11). The low percentages imply that a large proportion did not access transactional services, which would enable submission of online applications.

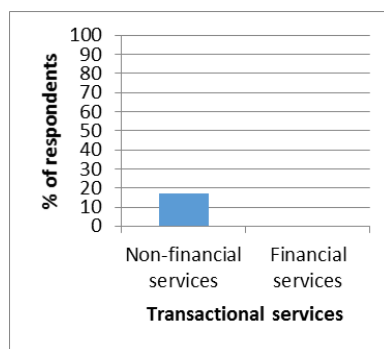


Figure 11: % of respondents that accessed financial and non-financial services.

Use of connected services

Few of the respondents accessed links to social media pages (16%) to participate and interact with public officials (Figure 12), discussion forums (6%), feedback and polling mechanisms. By contrast, chat room had no usage at all. These services are vital in enabling citizen to engage and participate in government activities and political processes. It is now necessary to discuss the service usage results.

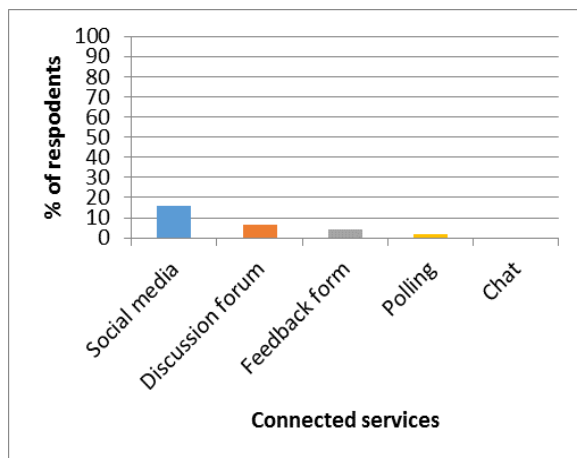


Figure 12: % of respondents that accessed services that connect agencies with users.

Discussion of service usage results

Comparing the use of emerging information services indicates that organisational structure, links to other websites, FAQs, employment and others (e.g. reports and statistics) were accessed by fewer respondents than government documents, news and events, service and contact details. Fewer respondents accessed help, sitemap, multimedia and other information services. Similarly, transactional and connected services were rarely accessed. Those services having low or no access could be a result of the limited availability or unavailability of such information services or that only a small number of websites provided these services (Daniel, 2016). Such services could enhance usability and accessibility of the sites.

As one of the major employers, it would be appropriate for agencies to provide employment and career information for graduates entering the workforce (United Nations, 2014), thus, making it helpful for those seeking employment options from these agencies. Likewise, providing FAQs would reduce the need for users having to go to physical public office locations (Daniel, 2016). This would assist users who need ready access to frequently used information to interact effectively with public officers or take particular actions when accessing services such as applying for a licence. It would be desirable to provide transactional services to enable users to conduct online transactions rather than having access through traditional means, which would normally

take longer than expected (United Nations, 2014). These services would also reduce the amount of cost involved in the process.

Providing connected services would allow users to engage effectively with agencies in government activities and provide constructive inputs to particular decision making in areas such as public policy formulation (Parajuli, 2007). Thus, users could hold agencies responsible, make them become more transparent and improve the responsiveness of officials (United Nations, 2014). As users normally desire their 'voices to be heard', these services would allow agencies to be receptive to the voices of users (Daniel, 2016). Further, providing links to social media pages could foster engagement with users, allowing them to express their preferences about provided services and interactions with government officials (United Nations, 2014). Feedback, polling mechanisms and discussion forums would allow users to participate in government undertakings and provide recommendations on how to improve public services delivery (Kaaya, 2004). Chat facilities would be essential for instant communication and real-time interactions between officials and users, allowing the latter to be assisted in a personalised manner (Daniel, 2016).

These services need to be provided and regularly updated, and users encouraged to access available services through awareness and promotion programs, which would increase accessibility and usage levels. Services such as multi-language, chat facilities and financial had no usage while others had very limited usage because they were generally unavailable. Providing support for multiple languages could greatly increase interaction with various languages groups, including non-English speaking users, in PNG (Daniel, 2016).

Discussion on state of service usage

The survey results were compared against the UN model to assess the state of service usage. Comparing the overall percentages of the four service levels indicate that more respondents (34%) accessed emerging information services. This could suggest that usage is functioning at the lower level of service delivery.

About a fifth (19%) accessed enhanced information services, which. These services could improve communication and interaction with agencies, and inform users so they are able to conduct their activities with agencies effectively.

By contrast, only a small proportion (9%) accessed transactional services. A reasonably substantial proportion did not access financial and non-financial services. Such services are needed to reduce unnecessary costs and time spent in obtaining these services (through traditional means).

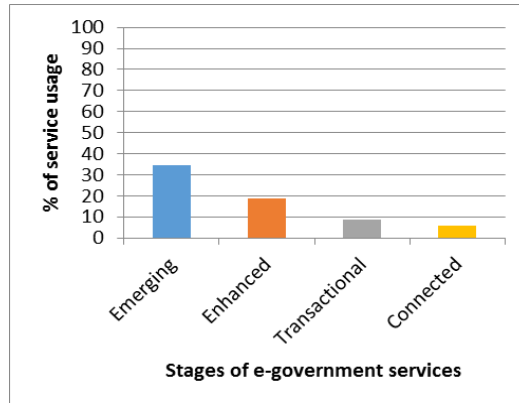


Figure 13: Information services had higher accessibility from respondents than the advanced ones, which suggest that service usage is mainly functioning at the lower level.

Similarly, a very small proportion (6%) accessed connected services, which suggests that a substantial number of respondents did not use these services. Again, these services need to be provided and users made aware of those that are available so that they can use them to participate in political activities and engage effectively in nation's democratic processes, leading to a government that truly serves its people. The findings (fewer sites starting to provide advanced services) indicate that there is a great potential for users to access services at advanced levels (Daniel, 2016).

Adoption of e-government could be influenced by various challenges (PNG Government, 2010) such as lack of resources, infrastructure, political support, appropriate policies and strategies, adequate funding, qualified staff, employment of suitable graduates, cooperation agreements between agencies and ability to be receptive to change by agencies. Adoption could also be affected by a lack of Internet services, awareness and promotion, availability of services, cost of Internet access and privacy and security concerns (United Nations, 2014). These are similar to the findings of Alshehri and Drew (2010), and would need to be addressed to improve service delivery and accessibility.

Recommendations

Various development plans aim to provide e-government services by 2030 have already been referred to (PNG Government, 2010). This paper has sought to provide an understanding of the state of e-government service usage, to aid government in providing an environment for agencies to further implement services and encourage citizens in using those services.

The government would need to develop an effective strategy for a successful roll out of e-government service development so that progress could be made from basic to more advanced levels, which in turn could contribute towards achieving the aims stated in the development plans. The strategy should

consider how to address the influential challenges and use an iterative model that considers the prevailing conditions of the country and effectively plan for adoption (Daniel, 2015).

To realise the impact of this development, it would be necessary to provide awareness so that users know what services can be accessed online. Making ICT and Internet services accessible and affordable to all users would enable convenient and frequent access to services. To enable services accessible to all users, it is necessary to increase the overall number of websites, as well as the quality of the existing websites to improve the level of service usage.

Conclusion

This paper examined the state of e-government usage by analysing 93 survey responses. In doing so, it discussed the UN model and by using this model, it described how survey responses were analysed to evaluate the state of service usage in PNG. It also reported on the findings and provided some understanding of the progress made so far, which could aid further implementation and use of services. Further, it discussed some of the challenges that affect progress including recommendations.

It was found that implementation mainly functioned at a basic level of service delivery, whereby most websites mostly provided information services (Daniel, 2016). A limited number of websites provided transactional and connected services, however, there is great potential for many of them to provide services that are more advanced so that progress can proceed to more sophisticated levels, provided that resources are economically managed and challenges properly addressed.

The paper demonstrated that service usage was also operating at a basic level, with most respondents accessing information services only. Fewer respondents accessed the limited transactional and connected services, however, there is a great potential for users to access advanced services as long as they are provided and Internet access made affordable and readily available.

The low level of service usage could be attributed to the various challenges (discussed above), which would need to be addressed properly to improve progress. Developing an effective strategy could be essential for facilitating further implementation and use services.

References

- Al-Shafi, H. S. (2009). *Factors affecting e-government implementation and adoption in the State of Qatar*. Unpublished PhD thesis, Brunel University. Retrieved from <http://bura.brunel.ac.uk/bitstream/2438/6266/1/FulltextThesis.pdf>
- Almahroqi, O. T. (2012). *Factors influencing citizen's adoption of e-government services in Saudi Arabia*. Unpublished PhD thesis, RMIT University. Retrieved from <http://researchbank.rmit.edu.au/view/rmit:160314>

- Alshehri, M., & Drew, S. (2010). Challenges of e-government services adoption in Saudi Arabia from an e-ready citizen perspective. *World Academy of Science, Engineering and Technology*, 4, 885-891.
- AlShihi, H. (2006). *Critical factors in the adoption and diffusion of e-government initiatives in Oman*. Unpublished PhD thesis, Victoria University. Retrieved from <http://vuir.vu.edu.au/483/>
- Cave, D. (2012). Digital islands: How the Pacific's ICT revolution is transforming the region Retrieved 20 November 2016, from <https://www.lowyinstitute.org/publications/digital-islands-how-pacifics-ict-revolution-transforming-region>
- Daniel, M. (2015). Electronic government: A development model for Papua New Guinea. *Contemporary PNG Studies: DWU Research Journal*, 22, 17-32.
- Daniel, M. (2016). Electronic government: Evaluating status through content analysis of government websites in Papua New Guinea. *DWU Research Journal*, 25, 24 - 39.
- Institute, N. R. (2016). Why are internet prices high in Papua New Guinea? Retrieved 20 November 2016, from <https://pngnri.org/wp-content/uploads/2016/10/DP148-201610-Deloitte-Internet-Prices.pdf>
- Logan, S. (2012). Rausim! Digital Politics in Papua New Guinea Retrieved 20 November 2016, from http://ssgm.bellschool.anu.edu.au/sites/default/files/publications/attachments/2015-12/2012_9_0.pdf
- Orgad, S. (2009). How can researchers make sense of the issues involved in collecting and interpreting online and offline data? In A. N. Markham & N. K. Baym (Eds), *Internet Inquiry: Conversations about method* (pp. 33-54). Thousand Oaks: Sage.
- PNG Government. (2010). *Medium Term Development Plan 2011-2015*. Port Moresby: Department of National Planning and Monitoring.
- Saunders, M., Lewis, P., & Thornhill, A. (2007). *Research methods for business students* (4 ed.). Edinburgh: Pearson Education.
- Suwamaru, J. K. (2013). *ICT initiatives in Papua New Guinea: Impact of mobile phones on socio-economic development*. Unpublished PhD thesis, Divine Word University.
- United Nations. (2014). *United Nations e-government survey 2014*. New York: United Nations Publications.
- Watson, A. H. A (2011). *The mobile phone: The new communication drum of Papua New Guinea*. Unpublished PhD thesis, Queensland University of Technology.

Glossary

- E-government Use of information and communication, and Internet technologies to improve service delivery and accessibility
- ICT Information and communications technology, which includes networking and telecommunications, hardware and software, databases and applications, standardisation and interoperability, privacy and security, policies and regulations on the use of technology

Service	Informational (e.g. contact details and download forms), transactional (e.g. e-passport) and connected (e.g. discussion forum) service
UN model	Model that could be used to evaluate the implementation and use of e-government service

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