

Government Information and Communication Technology (ICT) Procurement: Gap Analysis in ICT Tender Process

Md. Nor Hayati Tahir, M.A. Burhanuddin and Mohamed Maharroof Vaheed
Faculty of Technology Management and Technopreneurship,
Universiti Teknikal Malaysia Melaka (UTeM), 76100 Durian Tunggal, Melaka, Malaysia

Abstract: Many government's ICT projects fail to be delivered on scheduled time-line and it invokes escalated cost from its original allocated budget by the end of the project completion date. One of the main reasons is the ambiguousness and inadequate requirement analysis in the tender requirement specification done by the agencies in the public sector when the tender is called. There exists a significant gap from the understanding of what the customer wants and the comprehension of the potential ICT contractor who designs a solution according to the tender specification solely based on the tender document alone. This study would focus on understanding the gaps in the process and recommend a substitute model that would significantly reduce the failure rate and the cost over-runs of the ICT projects in the Malaysian public sector services. The research outcome would recommend that the User Requirement Study (URS) should be done with the potential ICT contractors prior to the tendering process and award to one of them who understands completely the intended outcome from the project by the agencies. Future research direction on developing business and technical user requirement for tenders with the customers and vendors prior to tender advertisement are discovered in this research.

Key words: Government's ICT project, ICT project failure factors, ICT project evaluation, ICT tender process, vendors prior, comprehension

INTRODUCTION

Background of the study: According to Othman *et al.* (2009), an ICT project is a project which aim to introduce and create an ICT system in a given procedure or operation. Putting up an ICT project refers to the specifications, modifications, internal workings alongside procurement of the system. Government agencies normally undertake large ICT projects that are supplied by ICT vendors from the private sector, most of these ICT systems are normally acquired through a tender process where governments highlight in the tender document the ICT system requirements. This document is then advertised publicly where a number of ICT vendors would submit their proposals; the tender process culminated by the government agency selecting one vendor to supply the ICT systems. According to Lauesen and Vium (2005) when sourcing for an IT system an agency has an option of getting a Commercial Off The Shelf (COTS) system or developing one from scratch as the COTS are cheaper and can be customized easily with its major drawback being the need for the organization to adapt to

the new system processes. This is why most agencies choose to develop their own systems from scratch, the bespoke method. This study will report on gaps analysis in the ICT tender process and how such gaps can be filled.

Statement of the problem: There exists gaps in the ICT tender processes of government agencies due to incomplete tender requirements which results in ICT vendors making a number of assumptions about what is needed by the government agencies. These assumptions turn out many a times to be inaccurate and this results in delay in most projects as the vendors are forced to make unexpected changes that comes at an additional cost to them. This results in the project using more resources than had been budgeted to some extent the project fails to be delivered on time and at the awarded price which is at a fixed cost by the government agencies.

Objective of the study

General objective: The general objective of this study is to do a gap analysis of ICT tender process and

recommend ways through which these gaps can be addressed. The specific objectives of the study included the following:

- To determine the main factors that affect different groups in ICT tender preparation exercise
- To determine the main factors that affect different groups in ICT tender evaluation exercise
- To find out the gaps that exists in the ICT Tender Process
- To determine the challenges that exist in the tender requirement preparation
- To show the common challenges in tender requirement evaluation

Research question:

- What are the main factors affecting different groups in ICT tender preparation exercise
- What are the main factors affecting different groups in ICT tender evaluation exercise
- What gaps exists in the ICT tender process
- What challenges exists in the tender requirement preparation?
- What are some of the challenges in the responded tender evaluation?

Significance of study: The significance of this study is that it will provide information on the issues surrounding the existence of gaps in the ICT tender process which is one reason that most undertaken ICT projects by government agencies tend to outstrip the initially allocated budget or end up in failure. These gaps upon investigation will allow for an opportunity to formulate better vendor-client interaction that would make the tender preparation and evaluation process productive and successful.

In addition, this study will show various stakeholders in the ICT tender process and the discovery of gaps within these processes between different departments which are among the reasons why some of the ICT projects fails. This study would be beneficial to the Government agencies and ICT vendors as it will enhance the knowledge of making better tender processes and mitigate against issues that result in most ICT projects ending up in failure or going beyond the allocated budget.

Literature review: This chapter will give a critical review of various relevant literatures that has been done on this topic. The chapter will also evaluate a number of relevant theories, issues, ideas and concepts.

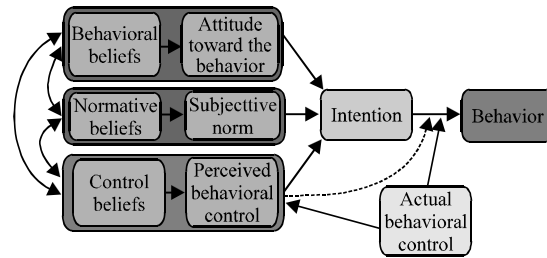


Fig. 1: The theory of planned behavior

Theoretical framework: The theoretical framework of a study is the structure that is used in supporting a theory of a given research. Through it, various theories used in a study are introduced and explained in addition to how the theory relates to the study.

Theory of Planned Behavior (TPB): According to Pavlou and Fygenson (2006), this theory is used to explain the various behaviors that individuals ability to exercise self-control. This theory has its main component behavioral intents which are influenced by an individual’s attitude about the chances that a given behavior will result in some expected outcome and in addition it calls for evaluation of the benefits and risks from that outcome. This theory has been used in predicting and offering explanations to a number of behaviors and intentions such as health services utilization, substance abuse among others. According to TPB, behavioral achievement is dependent on ability and motivation. As such there are three belief types-control, behavioral and normative. TPB has six constructs as showed by Fig. 1 used in the representation of an individual’s ability to control their behavior, these are; attitudes-which is the degree which an individual is unfavorable or favorable to evaluate their behavior of interest.

Behavioral intention-consists of the motivational factors which affects a given behavior to be performed. Subjective norms-is the belief on whether most individuals agree with or disagree with a behavior. Social norms are customary codes that influence the behavior of individuals while in a group or when in a bigger cultural context. Perceived power is the perceived presence of various factors which can impede or promote performance of a given behavior. Perceived behavioral control is an individual’s perception of how easy or difficult it is to perform a behavior of interest.

Resource based theory: According to Barney and Clark (2007) resource based theory is a basis of an organization’s competitive advantage and it involves the

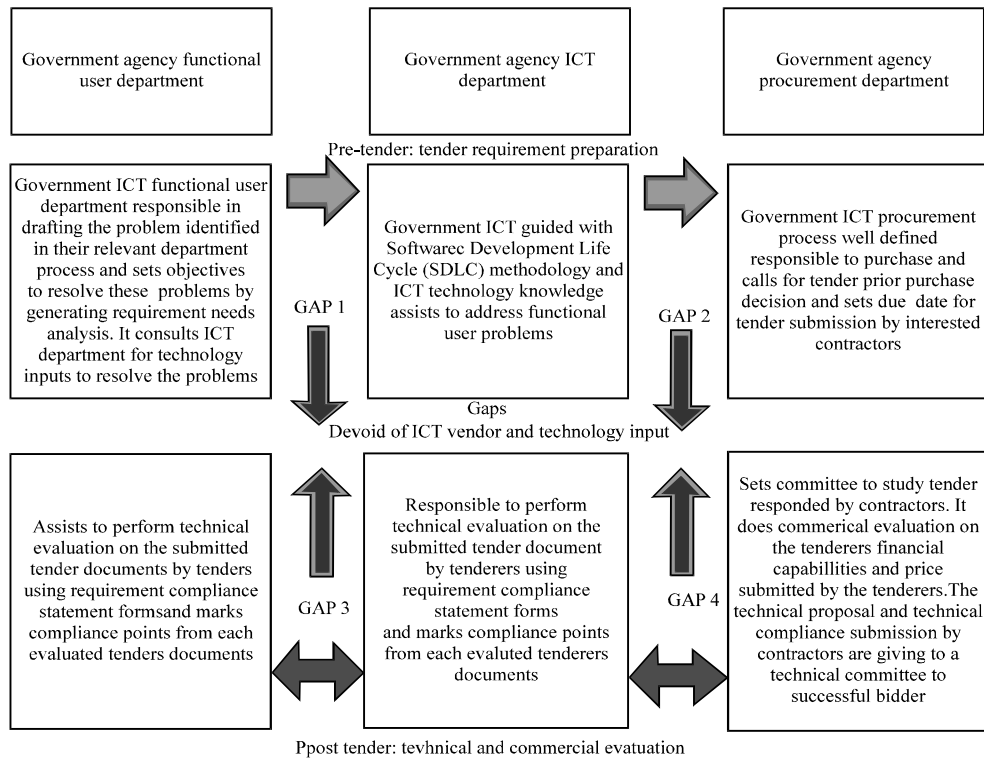


Fig. 2: Conceptual framework

organization applying its bundle of tangible and intangible resources that are valuable and available to the firm. For an organization to be able to change, its short term competitive advantage into what something that lasts over the long term, it calls for the firm to have immobile and heterogeneous resources. This will result and translate into the organization having valuable resources that cannot be imitated nor substituted easily. The resource based theory makes use of Valuable, Rare, costly to Imitate and Organized to capture value (VRIO) Model and Valuable, Rare, In-imitable and Non-substitutable (VRIN) Model.

Conceptual framework of the study: The objective of this conceptual framework as referred in Fig. 2 is to represent the departments and their roles in the government ICT tender process in this research. The roles played by each department are structured into 2 processes namely, the pre-tender process where user requirements are being prepared and the post-tender process where the technical and commercial evaluation are conducted. To achieve this, the research goal will direct the collection and analysis of data in building on the conceptual framework-improving it by filling in the identified gaps.

GAP 1: ICT vendor’s input is crucial at this juncture where the business requirements from the functional user group are to be translated into an ICT technical requirements. ICT vendor would complement the existing government ICT staff due to the lack of new technology knowledge and the business analytical skills which is required to translate accurately the needs of the functional users.

GAP 2: ICT vendor’s input is crucial to size up the approximate price for the whole exercise and gauge the overall spending for the business and technical requirement needs in order to set a correct purchasing budget.

GAP 3: ICT vendors may not sit in the technical evaluation committee but their inputs are required to draft a technical requirements compliance list against the tender technical requirements as the base reference as required by the functional users and its ICT needs.

GAP 4: Prior to procurement decision, the evaluated ICT vendors that complied to business and technical requirements have to be invited to perform a “demonstration” of their systems offering to the

technical and commercial evaluation committee. Careful consideration need to be given by the procurement department to the best fit solution, not merely procuring from the cheapest. This is due to government's fixed-price policy that is very strict on variations after contract executions.

Functional/business users factors: Business users or the functional user groups have a number of characteristics which results in gaps in ICT tender process which include issues such as they do not have relevant ICT technical knowledge. This will make it challenging for them to determine the technical specifications needed for a given project where in most cases these users require the help of the ICT department to efficiently use the ICT resources. In their job they have specific requirements that the ICT department has no idea of thoroughly integrating them in the tendering process especially on the part of developing system requirements results in the development of better ICT systems (Lamb and Kling, 2003).

ICT manager skills and technology factors: According to Sumner (2000), ICT managers have a number of key skills in ICT beyond that of the typical users as such they understand technical requirements and specifics but they do not have the business knowledge on the issues such as budgeting and making good use of resources. ICT specialists have information about matters happening in the technology field but they fail in the area of functional requirements as such they are unable to give vendors the intended detail functional requirements of various divisions within the organization. ICT managers functions to help manage and control the use of technology and information systems within the organization. The ICT manager acts as a link between the various users of ICT infrastructure and resources at all organizational levels. The ICT manager adopts a proactive approach in the use and development of the organization's information system through promotion of best use practices among the various users (Heeks, 2002).

Procurement managers factors: Procurement managers are critical in any organization as they are charged with planning and coordinating the research of people buying or selling products to the organization. Namely, their job is to ensure that the organization gets the best deals in any financial transaction. Among the duties of a procurement manager includes; securing purchase deals for the organization which involves doing a market analysis for the best deals and a favorable price for the business. Moreover, they are to make a price comparison of the goods and products from different suppliers.

Evaluation of suppliers is another research of the procurement managers which helps to secure the organization from fraudsters and ensure that the suppliers signed up deliver as promised. Managing data-this involves the manager being responsible for the maintenance and review of various purchase records. Coordination of the staff to ensure procurement activities of the firm runs smoothly (Edler *et al.*, 2005).

Tender requirement preparation challenges: According to Mateus *et al.* (2010), a tender is an offer that are made in writing, stating the willingness to execute a given work or supply some products or services at an agreed fee price under some predefined conditions.

All procurement needs to ensure that it conforms to accountability, transparency and integrity. These apply to the entire tender process of acquiring an ICT system. The preparation of the tender and other documents such as the contract documents including all the system requirements need to be given a clear guideline and a time scale that can be confirmed by the various vendors. The ability to get the entire requirements of the system is a challenge as in most cases there are new requirements that crops up.

The source of funds that will be used in the project should be sourced and made ready to facilitate initial payments when the project development starts. The funds that the government agency may ask for as the ICT project budget in most cases are normally below the amount required to complete the project as new requirements tend to come along during the implementation resulting in overspending (Al-Reshaid and Kartam, 2005).

It is important to effectively plan for the tender process before it commences. Among the things that can be done during this time includes in addition to the above, are consulting with various stakeholders on the requirements, these include the staff that will actually use the system and the public in the event they will be involved in the project implementation or usage. This is normally a challenge as different users have different requirements that would take time to incorporate all that is needed by the various users.

The procurement manager can scan the market to see the various solutions that are available based on the requirements where at this point the agency can hire a consultant to help gain feedback that will help in refining the system requirements before it is made public in an advertisement (Tadelis and Bajari, 2006). During the development of requirements, it is important to also develop various specifications that will give the market enough time to respond to the tender advertisement while

it will also encourage more innovation on the eventual project developed. The best specification should be output-based as this will show what the agency wants to achieve through the project and not how the vendor should deliver it. This will result in the vendors being forced to come up with innovative solutions. Getting the best specifications in terms of requirement is never certain as there may be changes in the technologies that will be used resulting in the specification being of little significance.

Tender requirement evaluation challenges: Tender evaluation needs to follow the set evaluation strategy and should be in line with its objectives. Evaluation is adopted in the procurement process so as to determine the tender that meets the needs of the tendering agency and achieves value for money. As such evaluation process needs to note the best solution in terms of delivering of the requirements and being within the set budget (Edler *et al.*, 2012). Among the challenges of the evaluation process includes inadequate early planning, lack of new technological skills by evaluators and failing to address integrations requirement to existing functional systems. In most cases this results in the evaluation team does not meet its goals. When the team is not equipped to appropriately evaluate the various tenderer responses and their proposed solutions, the result is going with the cheapest alternative.

Not testing the evaluation process makes it challenging to identify any problem that may emerge. This would include things such as doing a market analysis and testing demos or simulations (Roorda and Peace, 2009). During evaluation, it is a challenge to determine the entire cost of the project as the vendors may leave out some crucial information about hidden costs and only bring about those costs later during the project implementation which increased the chances of a project failing as it will in most cases outstrip the allocated budget (Edler *et al.*, 2005).

Poor technical assessment is another challenge that faces the tender committee as it may be possible that there lacks individuals within the evaluation team with the right skills to undertake a good evaluation. This forces the evaluation team at times to hire external consultants who at times can be costly (Roorda and Peace, 2009). Undertaking capacity assessment of the bidder can also be a problem where in order to get a clear result will require time and help from different organizations and departments that is filled with bureaucratic (Edler *et al.*, 2005).

MATERIALS AND METHODS

This chapter will deal with the research design and methodology that was used in collecting the data how the data was analyzed and eventually the research approaches used. In undertaking the study, a mixed methods research was adopted that entails both quantitative and qualitative methods. In analyzing the gaps that exists in the ICT project's tender processes, the study adopted the following techniques to collect data.

Literature review: This was used to see how the various research variables have been investigated by other researchers and the findings of these researchers. Most of the literature involved investigating the various gaps in the ICT projects tendering process.

Interview: The study interviewed 20 respondents who represented different ICT vendors. These occupied different positions within their organizations some were project managers, project directors and assistant technical managers. These respondents were asked a number of questions relating to implementation of ICT projects for government agencies. These questions aimed to ascertain the gaps that existed in the tender process.

Data analysis: According to Ott *et al.* (2001), data analysis involves putting order, ensuring structure and interpreting a large set of data. This is done through coding, cleaning and eventually processing of the data. The completed questionnaires from the study were received, the data cleaned, coded and analyzed using the SPSS software to make descriptive statistics possible showing the various gaps that existed in the tender process: the data from the analysis was also related to secondary data that covered the various gaps existing in the tender process.

RESULTS AND DISCUSSION

This chapter will give the results from the study and interpretations based on the primary findings and secondary data analysis. From the results of the data analysis a number of gaps were identified existing in the tender process that resulted in the most government ICT projects failing or using more than the allocated budget.

Participation in ICT tenders: This study investigates the participation of organizations in ICT projects tender process advertised by the government, 71.4% of

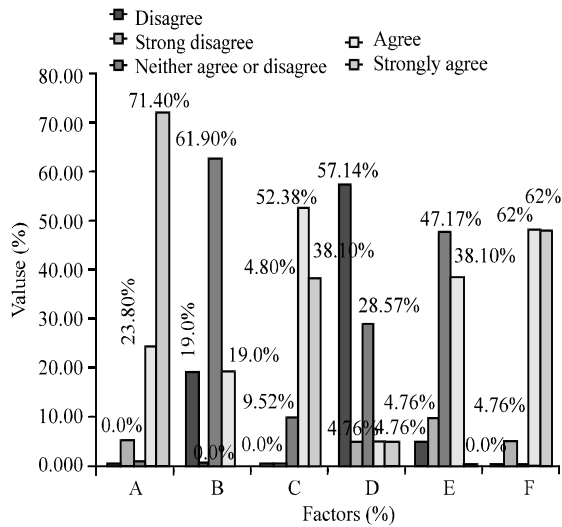


Fig. 3: Gaps in ICT tender procurement process factors A, B, C, D, E and F

the respondents strongly agreed that they took part in the tender process with 4.8% strongly disagreeing, the rest agreed that their organizations took part in the tender process as shown in Fig. 3.

Understanding customer requirements: Getting to understand the requirements of functional users is important if the ICT project is to be a success. Among the gaps in the ICT tender process was the issue that ICT vendor's input is crucial especially after functional users requirements have been translated into ICT technical requirement. Through working, the ICT vendors would complement government ICT managers and staff by helping to improve on the knowledge about new emergent technologies and analytical skills that are key to accurately translating functional user's needs to technical requirements.

Functional users groups lack the relevant ICT technical knowledge to determine the technical aspects of the ICT projects as they have been observed by Lamb and Kling (2003) that makes it hard for this group to determine the technical specifics needed for a given project where in most cases these users requires the help of the ICT department to efficiently use the ICT resources. But in their job they have specific requirements that the ICT department has no idea of by integrating them, the ICT vendor will clearly understand the user requirements as such they will be able to come up with better systems. The study showed that up to 62% of the respondents neither agreed nor disagreed that they understood what the customers required from the tender documents. As

shown in Fig. 3 that the issue of understanding customer requirements is a vital key and it has been discounted numerously.

Discrepancies in understanding user requirements: Gaps in the tender process exist due to there being discrepancies in how the ICT vendors understand user requirements. From the study more than 50% of the respondents agreed that there were discrepancies in understanding the needs of the users whereas over 38% strongly agreed on this factor. This is a testament to the existence of gaps in the tender process and eventually failure of ICT projects by the government as shown in Fig. 3.

Inappropriate design and technology used during implementation: On whether the design and technology used in project implementation was in line with current technology, 57.14% of the respondents disagreed with a further 4.76% strongly disagreed as this was the same number of those that agreed and strongly agreed. Whereas the remaining which was 28.57% neither disagreed nor agreed as shown in Fig. 3. According to Ditmore (2013) among the reasons most of the ICT projects failed was as a result of poor code and poor system design this is mainly attributed to the use of outdated technologies and processes in the software development, testing and implementation.

Feasibility study before drafting the requirement for the tender document: Among the gaps that the study determined included the issue of ICT Vendor's input being important in helping in the approximation of the project budget and other user technical requirements. There is a need as such to start involving ICT vendors early in the tender process so as to get the correct purchasing budget to be allocated to the project. From the study as to whether a feasibility study was undertaken, 38.10% of the respondents agreed while 47.62% neither agreed nor disagreed as shown in Fig. 3. According to (Nawi *et al.*, 2011) process factors plays a crucial role in making the ICT projects to be a success. In most cases especially of the projects that result in failure most are given without undertaking any feasibility study and in addition some of the projects are done on need basis without basing it on any project or government plan.

Changing user requirements during implementation: There exists a gap when ICT vendors could not sit in the technical evaluation committee though their inputs are vitally required. Instead they could also be invited to draft a technical requirements compliance list against

the tender technical requirements. Alternatively an independent ICT expert could be invited by the government agency as a neutral ICT consultant to assist the technical evaluation committee to do a proper tender evaluation.

The interviews from the study show that 47.62% of the respondents agreed that there was always a change in user requirements and the same number also strongly agreed. The remaining 4.76% strongly disagreed on the change in the user requirement as shown in Fig. 3. This is a demonstration in lack of involvement of technical expertise at the initial stage where the specification of technical requirements and incorporation of functional user's needs and requirements were collected. For a project to be a success a manageable team of functional users should take part in stating and formulating the requirements and this team should never change to a great degree as it will affect timely delivery of the project.

CONCLUSION

There are a number of conclusions that can be made from the results and discussions above where most ICT vendor organizations agreed that they took part in government tender process but the vendors in the study stated that they were not sure that they understood what the various needs of the customers are by looking at the tender documents alone. This results into gaps between the different personnel involved from functional users, ICT managers all the way to the procurement managers as there is a need to bridge these gaps, so as to make the tender process be high yielding in terms of the eventual project results.

RECOMMENDATION

In this study, future research direction is proposed on developing business and technical user requirement for the tender with the customer and vendors prior to tender advertisements.

ACKNOWLEDGEMENTS

The researchers would like to thank Faculty of Technology Management and Technopreneurship and Faculty of Information and Communication Technology, Universiti Teknikal Malaysia Melaka for providing facilities to conduct this research.

REFERENCES

- Al-Reshaid, K. and N. Kartam, 2005. Design-build pre-qualification and tendering approach for public projects. *Int. J. Project Manage.*, 23: 309-320.
- Bamey, J.B. and D.N. Clark, 2007. *Resource-Based Theory: Creating and Sustaining Competitive Advantage*. Oxford University Press, New York, USA., ISBN-13: 978-0199277698, Pages: 350.
- Ditmore, J., 2013. Why do big IT projects fail so often?. *Information Week*, <http://www.informationweek.com/strategic-cio/executive-insights-and-innovation/why-do-big-it-projects-fail-so-often/d/d-id/1112087>.
- Edler, J., L. Georghiou, K. Blind and E. Uyarra, 2012. Evaluating the demand side: New challenges for evaluation. *Res. Evaluat.*, 21: 33-47.
- Edler, J., S. Ruhland, S. Hafner, J. Rigby, L. Georghiou *et al.*, 2005. *Innovation and Public Procurement, Review of Issues at Stake*. ISI Fraunhofer Institute Systems and Innovation Research, Karlsruhe.
- Heeks, R., 2002. i-development not e-development: Special issue on ICTs and development. *J. Int. Develop.*, 14: 1-11.
- Lamb, R. and R. Kling, 2003. Reconceptualizing users as social actors in information systems research. *MIS Q.*, 27: 197-235.
- Laesen, S. and J.P. Vium, 2005. Communication gaps in a tender process. *Requirements Eng.*, 10: 247-261.
- Mateus, R., J.A. Ferreira and J. Carreira, 2010. Full disclosure of tender evaluation models: Background and application in portuguese public procurement. *J. Purchasing Supply Manage.*, 16: 206-215.
- Nawi, H.S.A., A. Rahman and O. Ibrahim, 2011. Government's ICT project failure factors: A revisit. *Proceedings of the International Conference on Research & Innovation in Information Systems*, November 23-24, 2011, Seri Pacific Hotel Kuala Lumpur, Malaysia.
- Othman, M., A.M. Zain and A.R. Hamdan, 2009. A survey on chaotic disruption of ICT project management and planning-triggers, impact, challenges and recommended measures. *JDCTA.*, 3: 46-50.
- Ott, L., M. Longnecker and R.L. Ott, 2001. *An Introduction to Statistical Methods and Data Analysis*. Vol. 511. Duxbury, Pacific Grove, CA.

- Pavlou, P.A. and M. Fygenson, 2006. Understanding and predicting electronic commerce adoption: An extension of the theory of planned behaviour. *MIS Q.*, 30: 115-143.
- Roorda, M. and R. Peace, 2009. Challenges to implementing good practice guidelines for evaluation with maori: A Pakeha perspective. *Soc. Policy J. N.Z.*, 34: 73-89.
- Sumner, M., 2000. Risk factors in enterprise-wide/ERP projects. *J. Inform. Technol.*, 15: 317-327.
- Tadelis, S. and P. Bajari, 2006. Incentives and Award Procedures: Competitive Tendering vs. Negotiations in Procurement. In: *Hand book of the Procurement*, Dimitri, N., G. Pigo the and G. Spagnolo (Eds.), Cambridge University Press, Cambridge, England, ISBN-13: 9781139459259.