

Theoretical Foundation in Analyzing Gaps in Information Communication and Technology (ICT) Tender Process in Public Sector

¹Md. Nor Hayati Tahir, ¹Mohamed Maharooof Vaheed and ²M.A. Burhanuddin

¹Faculty of Technology Management and Technopreneurship,

²Faculty of Information and Communication Technology,

Universiti Teknikal Malaysia Melaka (UTeM), 76100 Durian Tunggal, Melaka, Malaysia

Abstract: Information and Communication Technology (ICT) has become a catalyst for improving productivity and competitiveness of various sectors in modern economies. However, to achieve this implementations of ICT projects by governments, it has to be effective and efficient to avoid bottlenecks and other challenges that results in undermining the executions on some of the ICT projects. Indeed there are several factors that contribute to the failure of meeting the original budgets, schedule and even collapsing before completing the ICT projects initiated by the public sector in Malaysia. This study examines the gaps within these processes and proposes theoretical foundations on analyzing these gaps in an ICT tender process in the public sector procurement.

Key words: ICT tender theories, ICT procurement management, government's ICT project, ICT project failure factors, ICT tender evaluation, communication

INTRODUCTION

In many economies, ICT plays a catalytic role for improving productivity and competitiveness for their various public sectors agencies in their countries. In Malaysia, for example, ICT was listed as the driving force for economic growth in the country's Economic Transformation Program (ETP). The program focuses on initiatives which are inclusive and sustainable, aiming to transform Malaysia into high income country by 2020. However, there is a high rate of ICT projects in the public sector which are failing to be completed (Nawi *et al.*, 2012). In Australia, its public accounts committee's review of the national and international literature indicates that negative experiences with ICT projects are common both within Australia and overseas. One overseas study found that while the average overrun was only 27% one in six of the projects examined had a cost overrun of 200% on average and a schedule overrun of almost 70% (LANT, 2014).

Back ground: An ICT project is usually initiated with the intention of creating and introducing a new ICT system within an operation or procedure to improve their existing business processes (Othman *et al.*, 2009). This research will focus on the procurement process of government ICT projects, the challenges faced during the procurement

process, the gaps that are caused by these challenges and suggest ways of closing these gaps within the windows of a theoretical framework. This research topic is of great importance given the high rate at which the ICT projects which have been initiated by government agencies are failing to meet their budgets, timelines or even failing to be completed at all.

Part of this study uncovers a number of factors that contributes to the gaps in the ICT projects procurement process initiated by government agencies that fails to meet the original budgets, schedule and even collapsing along the way. Some of these factors are anticipated to occur even before the tender for the ICT project is awarded to an ICT vendor. This can be attributed to a lack of analysis of the user requirement study that justifies a business case of its relevancy before a tender is awarded. The flaw exists when the Software Development Life-Cycle (SDLC) begins only after a project is awarded as it is often practiced. Usually after a tender has been awarded to a vendor, the methodologies of the project management lifecycle and the software development lifecycle will kick start. But due to the ambiguity of exact user needs of a comprehensive requirement study before the tender is awarded to an ICT vendor, the project leads not to be completed on time on budget or fail completely. Hence, the direction of this study is to uncover the gaps in the procuring process through a tender exercise.

The other part of this study will focus on the theoretical foundations to be used to analyze the gaps and exploring to resolve through theories on the approaches of bridging these gaps.

Three main departments are involved within this process of creating tender specifications for a government agency's ICT requirement:

- Functional User Department, i.e., the Human Resource (HR) Department, Accounting Department, etc
- Information and Technology Department
- Procurement Department

These three departments are required to research together in order to come up with a tender document for procuring an ICT related hardware and software system, usually to improve their business processes in their agencies. Although, these three departments are each effective in their own particular skilled area but they turn out to face challenges when it arrives at cross departmental knowledge and skills. This poses a challenge when the functional department may come up with a requirements document which may end up being mis-understood or mis-translated by an ICT Department. Putting this into perspective, the Human Resource (HR) Department who are in need of a new ICT system will create a document which contains their business needs and forward this document to the ICT Department. The ICT Department will now have to evaluate and translate these business needs of the HR Department and create an ICT/HR requirement document. This process will be done using their best knowledge about HR management which may in turn be inadequate. When the requirements document is "complete" it is forwarded to the Procurement Department and this eventual procuring department who are not expected to know the in-depth knowledge of neither HR functions nor ICT terms would forward it to be advertised for an invitation to bid for interested ICT vendors to propose a solution.

Problem statement: There are gaps in the ICT projects tendering process initiated by government agencies due to poor preparation of the projects requirements which leads the ICT vendors to come up with assumptions which sometimes end up to be inadequate. This usually leads to projects failing to meet their deadlines, costing more than they were initially budgeted for and even fail to be completed.

Objective of the study: The study's general objective is to examine the gaps which are present in the ICT tender

process in public sector and recommend ways through which they can be addressed. The study's specific objectives include:

- To determine the factors which affect the different government groups who are involved in ICT tender preparation and evaluation
- To determine the gaps present in the ICT tender process in public sector
- To determine the challenges faced when preparing the requirements for the project

Research questions:

- Which main factors affect the different groups involved in the ICT tender preparation process
- What gaps are present in the ICT tender process in public sector
- What challenges are faced in preparing the tender requirements
- What challenges are faced in evaluating the tender requirements

Significance of the study: This study is significant because its findings will help in reducing the failure rate of ICT projects in Malaysia. It will do this through, greatly improving the model used for ICT procurement process and in the process improve elicitations of business and technical user requirement. This study also stands to benefit the following groups, the procurement division of the ministry of finance, MAMPU, PEMANDU, implementing coordination unit, ICU, JPM, ICT vendors as well as systems integrators.

Theoretical framework: A study's theoretical framework is the structure which is used in to support the theory applied in that study. Using the theoretical framework, the theories used in the research get introduced and explained, showing how the theories relate to the study.

There were four identified gaps which were discovered during this study in an ICT project procurement environment as illustrated in Fig. 1. These gaps are analyzed and the study recommends crucial inputs to close these gaps as concluded by Tahir.

Gap 1: ICT vendor's input is crucial at this point where business requirements from the functional user group are to be translated into a ICT technical requirements.

ICT vendor would complement the existing government ICT staffs due to the lack of new technology knowledge and the business analytical skills required to translate accurately the needs of the functional users.

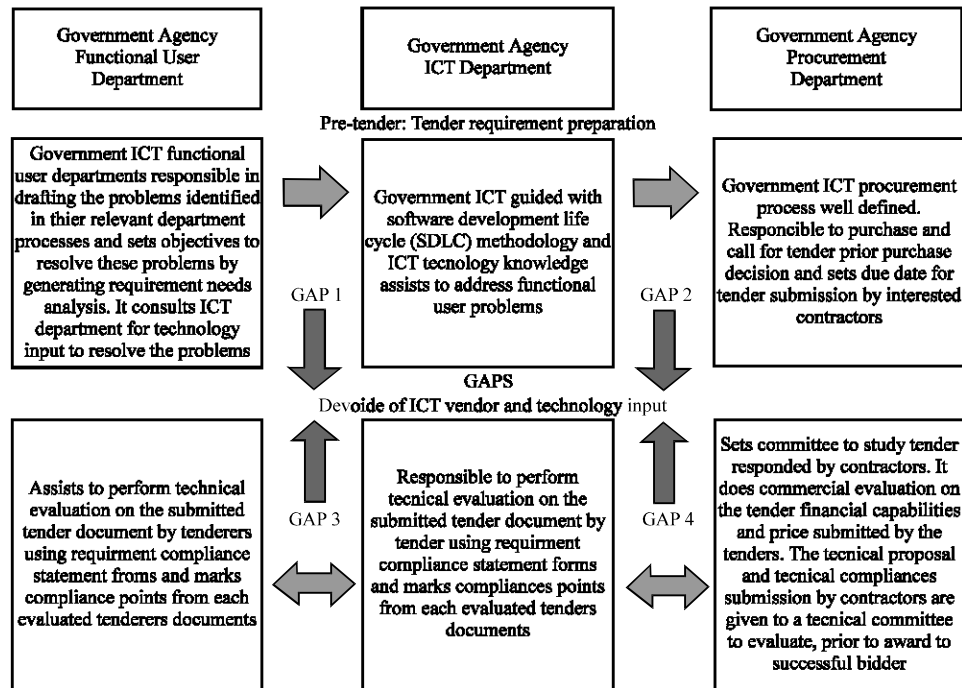


Fig. 1: Government ICT procurement framework gaps analysis

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.

Gap 4: Prior to procurement decision, the evaluated ICT vendors that complied with business and technical requirements have to be invited to perform a "demonstration" and proof of solutions 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.

These gaps in the government ICT projects procurement process are going to be examined further in this research and three theories suggested to help in bridging them.

Literature review: In many countries, ICT projects which are initiated by the government usually don't get

completed on schedule within the initial budget or don't get completed at all. According to PIPC (2005), 31% of Information Systems (IS) projects didn't deliver on schedule and 31% exceeded the set budget. In the Czech Republic, a study in 2009 showed that over 50% of IS projects did not get completed on schedule or within the expected budget. About 5% of the projects did not even get completed (Nawi *et al.*, 2012). Wright and Capps III (2010) state that many large IS projects usually exceed their initial budgets and timelines by over 50%. This is more prominent in government projects than private sector projects. There is also evidence that some of the projects don't even get finished, especially in organizations owned by the government.

Accordingly the legislative assembly of Northern Territory, Public Account Committee in Australia, reports that 15-28% of ICT projects are abandoned before completion, 30-40% of ICT projects experience some form of escalation with cost overruns averaging 43-189%, 30-40% of projects are implemented without perceptible benefits, 80-90% of ICT investments fail to meet their performance objectives..

In order to best describe how the four gaps in the procurement process of government ICT projects can be bridged, the researcher propose three distinct theoretical foundations in analyzing and resolving these gaps. The first theory the researcher is proposing is the dialectical theory which will assist in bridging gap 1 in the procurement process. The second theory is the resource

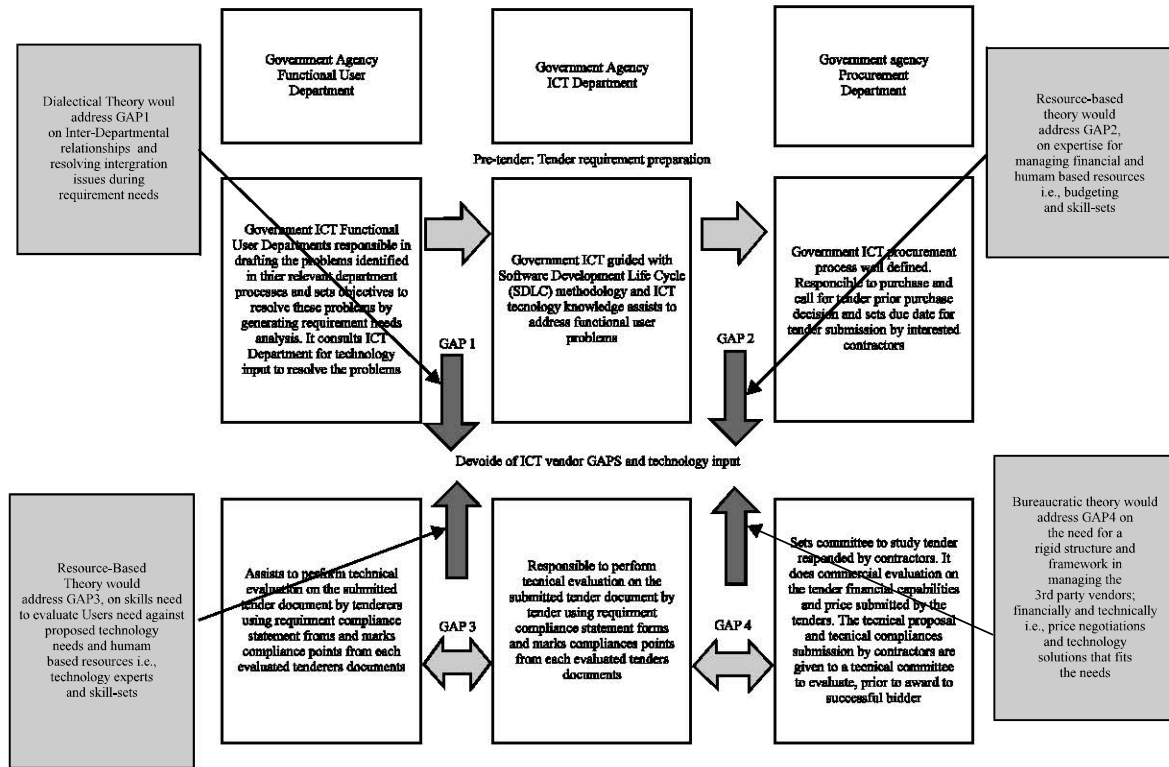


Fig. 2: Theoretical foundation for government ICT procurement framework gaps analysis

based theory which will aids in bridging gaps 2 and 3. The third and final theory is the bureaucratic theory that will assist in bridging gap 4 within the ICT procuring process. These three theories as illustrated in Fig. 2 will be explained independently in order to give a better understanding of how they would accommodate in bridging these gaps.

Dialectical theory to address gap 1: Dialectical theory that address gap 1 examines the development of relationships from the interplay of contradictions or perceived opposite forces and how this ever changing process can be negotiated by communicators (Anderson and Ross, 2002). Baxter (1990) states that dialectical theory deals with both differences and unity within a relationship. During the procurement process for an ICT project, the user group, the HR group will forward their business needs to ICT Department who will translate them into HR/ICT requirements with the best knowledge they have about HR. Each department is operating independently due to poor inter-departmental relationship, leading to gap 1 in the process. In dialectical theory there is a contradiction that is an opposition, discrepancy, conflict or contrast between two things (Wood, 1997). In this case, the contradiction is the poor

understanding or relationship between the two departments, the HR and ICT. Another important concept in dialectical theory is process. Process states a fact that dialectics are always ongoing and continuous.

The theory believes that change is present and part of every relationship (Lusk, 2008). Using dialectical theory, the poor interdepartmental relationship between the user group (HR) and ICT can change over time, creating a good environment for consultancy on major issues like requirements engineering, hence, bridging gap 1 in the process.

Resource-based theory to address gaps 2 and 3:

Resource-based theory states that resource possession is rare, valuable, difficult to imitate and cannot be substituted. The theory argues that organizations need to look within for resources to help them have a competitive advantage. Resources owned by an organization fall into six categories, physical resources, financial resources, technological resources, human resources organizational resources and reputation.

Addressing gap 2: Resource-based theory will play a major role in assisting the Procurement Department in setting up the correct purchasing budget for the ICT

project. The theory will help the Procurement Department to adequately manage the financial resources of the government agency that are tasked in implementing the ICT project. When the purchasing budget of a project are correctly managed, the risk of the project costing more than budgeted for and even failing to meet the time frame are greatly minimized, aiding in bridging the second gap in the government ICT procurement environment, this theory will also support in appropriate utilization and management of the human resources by making the best use of the agency's most skilled employees in preparing the purchasing budget.

Addressing gap 3: Resource based theory will also assist in bridging gap 3. This gap is bridged when the government agencies that are responsible for the ICT procurements makes the best use of its human resources during the evaluation of the user needs against the proposed technological needs. This will be achieved when the government agency makes use of the best skilled employees on its disposal. It will need employees with a very good background in ICT skills, business process skills and make them research together in order to come up with a final procurement requirement document. When the government agency has employees with such expertise and manages them correctly then this bridges gap 3 in the ICT procurement activities.

Bureaucratic theory to address gap 4: The bureaucratic theory was developed by Max Weber and it has two elements which are significant. The first element is that an organization needs to be structured into a hierarchy. The second element is that the organization along with its employee in government agencies are governed by rational-legal decision-making rules which are clearly defined rules. In order for the fourth gap in the ICT project procurement process to be adequately addressed, the government agency responsible for the project needs to have a clearly defined management hierarchy in place. With a proper hierarchy and clearly defined rules in place, best decisions can be easily made. The procurement team will make the best decision concerning a vendor when they have expert superiors they are answerable to on their decisions made. Clearly stated rational-legal decision-making rules ensure that the proper procedures are followed when selecting an ICT vendor and the solution to implement. A procedure like ensuring that the vendors demonstrate their products before one of the them is given the award to the tender ensure that the best fit solution is selected and not just one that is cheap. It also helps avoid the government officials from awarding the tenders to vendors they favor but fails to deliver the

best required solutions. Gap 4 will be bridged with a proper hierarchy and operating procedures for the government agencies.

MATERIALS AND METHODS

The research method used in this study is the mixed methods which involves both the qualitative and quantitative research methods. In order to get accurate data during the study, the researcher collected data directly from different ICT vendors who have taken part in implementing ICT projects for the government and employees at government agencies which had carried out ICT projects, especially those who are experienced with SDLC and PMP methodologies.

In order to get a good understanding of the ICT projects procurement process, 10 different ICT vendors and 5 different government agencies which had implemented ICT projects in the past were examined qualitatively. The study on these agencies focused on the entire ICT project procurement process from preparing the business, transforming them to ICT/user group requirements, advertising of the tender to selecting the ICT vendor to implement it.

Interview was the researcher's main method of data collection, since, it enabled to get the first hand data from the informants. The researcher was able to conduct face-to-face interviews as well as telephone interviews with the informants. In total 20 different respondents from 10 ICT vendors were interviewed addressing the implementation experiences on government ICT projects. In order to get accurate information, the informants were selected from different ranks within their organizations including project directors, project technical managers and project managers. The questions mainly focused on the part they played in the tendering process of the government ICT procurements. A total of 10 government agencies employees were also interviewed about the procurement process of the ICT projects initiated by the agencies. The interviews focused entirely on the ICT Departments, user group departments and the Procurement Department.

Some informants were not available for interviews, so, open-ended questionnaires were used. The questions mainly focused on the participations of government tenders, the understanding of the requirement needs in the tender documents, the change request during implementations and project management responsibilities within the scope of the procurement process of the ICT projects.

Secondary sources were used as the source of data on the success and failure rate of government ICT

projects. It involve some result from past research by other researches on reasons why government ICT projects fails to meet deadlines, the set budgets and the challenges of being completed at all.

RESULTS AND DISCUSSION

Potential contributions and future research: There is a need for further research to be done on the procurement process of government ICT projects and the existence of gaps within the processes. Three theories discussed are the dialectical theory, resource based theory and the bureaucratic theory for this study will elevate in the understanding on how the four gaps in the procurement process of ICT projects can be bridged. These theories will assist in understanding the relationship between different departments in the government agencies, understand how to maximize on the government agencies resources and the importance of a proper line of command and laid down rules of engagement. Some of the contributions of this study include the following.

Bring about a better understanding of the complex relationship between the agencies departments in the procurement process of ICT related projects. This relationship is explained out by the dialectical theory which was discussed in this study. When the relationship between the different agency's departments is clearly understood then a way forward can be reached and the gap which is brought about the "lost in translation" would be bridged.

Assists the government agencies in maximizing their resources. The study discusses the resource based theory which can be used to better understand on how to maximize the available resources correctly for the government agencies in order to get the best out of the ICT project which is being implemented by an agency.

Assists in understanding the importance of having laid down a structural rules of engagement during the procurement process and a proper management hierarchy. Proper rules of engagement will aid in avoiding short cuts being taken during the procurement and understand exactly what is proposed by the vendors and award accordingly. A proper order of management allows a right decision is made and prevents confusions and conflicts. In terms of assisting the Malaysian government improve success rates in their ICT projects this study is significant due its findings that will bring about in bridging the four gaps which leads to many failures of ICT projects in Malaysia. This can be achieved through, completely improving the model used for ICT procurement process and in the process improves elicitations of business and

technical user requirement before a tender is awarded. This study also stands to benefit the following groups, the procurement divisions under the jurisdictions of the Ministry of Finance, Malaysian Administrative Modernisation and Management Planning Unit (MAMPU), Performance Management and Delivery Unit (PEMANDU), Implementing Coordination Unit, (ICU), Jabatan Perdana Menteri (JPM) and ICT vendors as well as systems integrators.

CONCLUSION

The study utilized literature reviews where critical reviews of past studies on this topic were done as well carried out short interviews to establish primary information from respondent. The findings indicate that the study can contribute towards bringing a better understanding of the complex relations that exist between ICT vendors and government agencies and assists the government agencies to maximize their resources and aid relevant parties to understand the importance of following laid down rules of engagement in the course of procurement.

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