Strategies and Critical Success Factors of Implementing ICT Project Governance in Public Sectors

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Abstract: In today's fast changing economy, ICT project governance has become as one of the most central corporate responsibilities. Despite more than 50 years of history, countless methodologies, advice and books, ICT projects keep failing. This research investigates the effects of critical success and failure factors through the effectiveness of ICT governance framework. The aim of this research is to produce an ICT governance framework to reduce the failure rate of ICT projects. A process improvement framework is constructed through the combination of standard set of framework practices and PDCA method model to reduce the failure rate. Evaluation of existing and proposed ICT governance framework has structured based on project governance parameters. Moreover, discussions with project managers have taken place to analyse the context of governance frameworks according to their best practices. In future, this tested framework will be proposed to the project managers or related organisations to apply on their projects for evaluating the significance.

Key words: ICT project governance, ICT project frameworks, COSO, PDCA model, framework evaluation

INTRODUCTION

In past, ICT was considered as a support function with separate and distinct from a business. Today, ICT applications and infrastructures are so fundamental to several functions and business lines and the organization cannot progress without ICT. Senior executives must take lead to build up an effective business between ICT organization and rest of the organisations (Reynolds, 2010).

The research focuses on ICT project governance, success and failure factors and frameworks of ICT governance such as COBIT, ITIL, PRINCE2 and AS/NZS 8016. It is important to understand the ICT governance and co-relate them for the research purpose. ICT governance described at a number of levels such as global, national, industry, corporate and project level. Governance encompasses processes by which organizations consider determination, connection, monitoring and evaluating. These processes allow significant decisions of an organization (Muller *et al.*, 2016).

Project governance is significant for the success behind every project and should be made into scale to address the level of complexity of the investment. Sometimes the budgets of ICT projects are insufficient. Moreover, in ICT environment some investments are for the same product because of lack coordination of ICT policies and plans to guide investment. Capital and human resource requirements entitled as operational costs that ends with the project phase (Tricker and Tricker, 2015).

Literature review:
Corporate governance: Corporate governance is the set of process, customs, rules, policies, procedures and traditions that determine how to control management activities. The primary people connected with corporate governance include board of directors, CEO, senior executives and shareholders (Reynolds, 2010). Good corporate governance should provide proper motivation to the management and board to pursue the objectives. Corporate governance also provides the structure to gain the objectives that are welfare of the company and shareholders.

ISO/IEC 38500 standard provides board guidance on the top management level role corresponding to IT corporate governance because unsatisfactory information system can obstruct the organization's competitiveness or executing them to the threat of conflicting with legislation.

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Five key activities for effective ICT governance (Reynolds, 2010):
- Risk management
- Performance measurement
- Value delivery
- Strategic alignment
- Resource management

Principles of corporate project governance involving ICT investments: ISO 38550 provides framework for good corporate project governance with six guiding principles that involves ICT investment (SAA, 2010).

Principle 1: Management of projects, accepted roles with investment in ICT governance is involved with responsibility for realization on projects value. This includes with project activity management, selection, prioritization of project, benefit realization and business change.

Principle 2: Strategy maximizes the potential projects success that is associated with the ICT investments.

Principle 3: Investments are ongoing and appropriate analysis to make sure the priority of the projects is to contribute on business strategy.

Principle 4: Performance is that each project is managing to achieve its agreed goal at the same time managing organizational risks.

Principle 5: Every project should have internal policy and external regulation such as conformance.

Principle 6: The resultant deliverables, business process changes and planning and management activities demonstrated by every project for a human behaviour.

Goals of effective ICT governance: ICT governance includes investments and decision making process. There are two goals in ICT governance primary goals to ensure that an organization should achieve good values from their investment and also mitigate ICT related risk. Figure 1 presents both of the goals have same value to ICT governance. It is similar to financial portfolio management in which a manager can calculate the return of the investment and balances the risk associated with it. Good value achievement depends on the ICT initiatives and business objectives (Weill and Woodham, 2002).

Key activities for effective ICT governance: Effective ICT governance is associated with five key activities such as
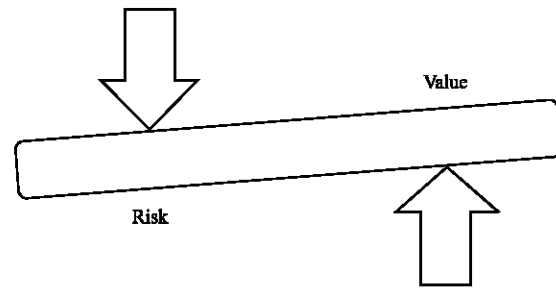

Fig. 1: Primary goals of ICT governance (Reynolds, 2010)

risk management and ICT value delivery is the goal of effective ICT governance. Resource management and strategic alignment both of these are the way to achieve the ICT governance goals. Performance measurement helps to identify how well the governance efforts are succeeding (Reynolds, 2010).

Agile and project governance: Project governance and agile are not fundamentally opposed as both of them attempt to improve the final product. Agile activities do this with the association and short cycle of sprints. In project governance, the project or product approve or reject by comparing to a set of desired attributes (Talby and Dubinsky, 2009). However, agile or scrum and project governance both of them use entire rules to achieve their desired goals. The project will not complete any stage without the approval of Chief Executive (CE). The team does not need a permanent change in the governance policies and it is important to follow the board members expectation to progress on the stages. To maintain this in governance, fixed weekly meetings with the project teams and effectively fortnightly meeting with the board members are necessary to deliver the project with better outcome. In this methodology, the failure chances are very low as it has developed every stage according to the client's expectations (Muller, 2012).

PDCA model: In Plan-Do-Check-Act (PDCA) model each of the steps has specific objectives. It is a continuous cycle model that has no end point. This cycle should be continual for improvement. Four step methodology that works for the improvement of the business. ISO 9001 standard refers to PDCA and this cycle was popularized by one of the quality management master Dr. W. Edwards Deming (ISO, 2015).

PDCA steps:
- Plan: ascertain objectives and how the objectives will be achieved

- Do: situate the plan into effect
- Check: this stage confirms the desired result of the process verified or not
- Act: analyse the causes and differences and take action to improve the causes.

ICT governance frameworks: During the implementation of ICT projects, frameworks provide approaches to develop effective ICT process (Sahibudin *et al.*, 2008).

ITIL: Information Technology Infrastructure Library (ITIL) is a framework of ICT project governance to provide effective IT Service Management (ITSM) (Steel *et al.*, 2006). Best practice framework of ITIL provides control of IT service support, effective management, process improvement of IT service management, audit and documents to the managers (Taghva *et al.*, 2016).

Five core publications of ITIL consist of best practices in details. The volumes are ITIL service strategy, ITIL service transition, ITIL service design, ITIL service operation and ITIL continual service improvement. ITIL is the direction of services to fulfil the requirements of the business and customers to current and future requirements. ITIL reduces the long-term cost of services and improves the quality of services by giving value to the business with a cost efficient manner. It describes what NTG should do but it does not describe about how to do.

COBIT: Control Objectives for Information and related Technology (COBIT) provides IT resources and process for monetary control, objectives of business, quality standards and security issues by set of guidelines. ICT governance institute issued all these guidelines by providing critical success factors, metrics and best practices for the process of ICT. COBIT provides a well-managed ICT environment to serve audit functions and management to control their environment. The four major categories of COBIT framework are Plan and organize, acquire and implement, deliver, support, monitor and evaluate.

In terms of control responsibilities, COBIT serves about control projects in management concerns by measuring performance and minimizing the project risks. ICT department always faces a pressure to meet the business goals. Indeed, COBIT is a guideline for ICT to identify and focus to the challenges.

PRINCE 2: PRINCE2 emerged as a prominent methodology to ensure the track of IT projects and

delivering real value. This has become widely used approach in both private and public organizations. PRINCE2 is an integrated framework of project performance aspects of themes and process that addresses effective PRINCE 2 results from four keystones that defines the success factors of managing projects. These are project planning, progress controlling delivery results, progress measurement through business case. PRINCE 2 originated both good and bad lessons learned from projects. The principles of PRINCE 2 are learnt from experience, continued business justification, manage by exception, manage by stages, defined roles and responsibilities, product focus, tailor to suit the project environment (Tayebi *et al.*, 2010).

AS/NZS 8016: AS/NZS 8016 is a short document of around 16 pages as Australian and New Zealand standard. It is a system that involves ICT capability that controlled and directed from initiation to the business outcome achievements. This is related with corporate governance projects that involve with IT investments (SAA, 2010). The framework was designed to the advisors and the directors. AS/NZS 8016 provides benefit of accountability for all ICT risks and activities. The framework provides warning to the senior management and the advantage of it is having mechanism that will cease to change. This framework provides more opportunities to cancel the project if any circumstances happen.

MATERIALS AND METHODS

Background: ICT service management focuses on specific ICT governance frameworks for public organization. Each framework has specific value to offer with their strengths and weakness. On the other hand, if the management system picks up one framework then they may miss other great guidance and the management system will lose important characteristics of project. According to the research findings, detail implementation on processes is provided by ITIL. COBIT is strong because the goal settings do not provide details on the implementation on governance process, PRINCE2 is an integrated framework of project performance aspects of themes and process that addresses plan, allocation, monitor and control and AS/NZS 8016 involves ICT capability that controlled and directed from initiation to the business outcome.

Proposed methodology: ITIL is a collection of best practices for ICT operation. When using one or two
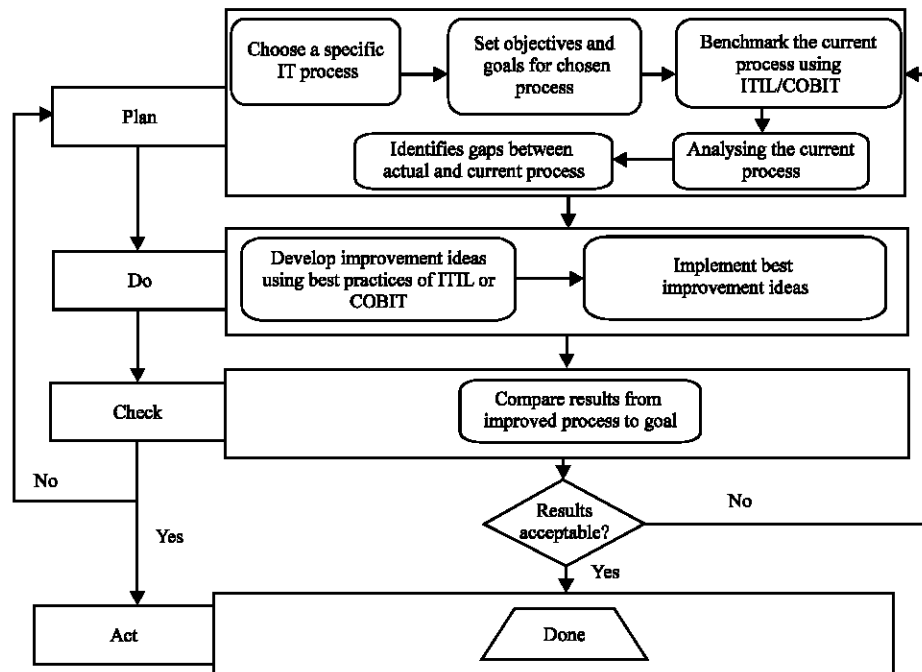
Fig. 2: Proposed methodology

standards together such as ITIL and AS 8016, the challenge can be threatening because it is complying with policy. In business process, ICT plays an important role and ICT departments are not only creates complexity but also proves demonstration to the compliance.

COBIT provides IT resources and process for monetary control, objectives of business, quality standards and security issues by set of guidelines. PDCA is a proven and tried method that provides the improvement procedures. As a result, ITIL or COBIT provides an excellent set of practices; PDCA and agile have spread and added increasingly competitive and dynamic approach; framework must be selected based on specific project category; using PDCA, agile and ICT governance framework (COBIT/ITIL) model as process improvement.

This methodology based on research literature review and current business situation in the public organization (Fig. 2). If public organization wants to improve their success rate on ICT project governance, this methodology can be a good practice for applying on their projects. Indeed, after using this methodology, the public organization must measure whether they are getting benefits from their investments.

RESULTS AND DISCUSSION

Research evaluation

Background: This study represents the evaluation of the proposed ICT governance framework. Primarily, analysis

between existing ICT project governance framework and proposed ICT governance framework will present to conceive of and evaluate the research effort. Four types of framework such as ITIL, COBIT, PRINCE2 and AS/NZS8016 have selected to do the analysis. Evaluation on existing and proposed ICT governance framework based on four kinds of parameters such as key characteristics of ICT project, project lifecycle and success factors of ICT project governance and characteristics of good project governance.

Evaluation of the proposed ICT governance framework: The successes of ICT projects are critical due to inherent complexity, composite risk profile and abstract nature to appropriate governance framework. To ensure that the endorsed benefits and project scope delivered within the approved budget for ongoing project control and monitoring and effective decision-making concerning the boundaries of project delivery. Formal governance is necessary to provide these appropriate forums. ICT knowledge may limit to the user perspective and projects can provide significant challenge to the Senior Responsible Owner (SRO).

Research on project governance provides advantages to figure out four areas of parameters such as key characteristics of ICT projects, ICT project lifecycle, success factors of ICT governance and characteristics of good governance. In the evaluation table, 'X' sign

Table 1: Evaluation of frameworks based on key characteristics of ICT project

Key characteristics	Framework				
	ITIL	Cobit	Prince2	AS/NZS 8016	Proposed framework
Project has a unique solution			X		
Project has boundaries, so its extent is defined	X	X		X	X
Project is a one-time effort, usually requiring finite resources	X	X		X	X
Project has a committed budget that must be respected		X	X	X	X
There are distinct start and end dates for projects	X	X	X	X	X
You know when you have reached the end of the project	X	X		X	

Table 2: Evaluation of frameworks based on ICT project lifecycle

Key phase	Framework				
	ITIL	Cobit	Prince2	AS/NZS 8016	Proposed framework
Project initiation	X	X	X	-	X
Project planning	X	X	X	X	X
Project implementation/execution	X	X	X	X	X
Project monitoring/controlling	X	X	X	X	X
Project closure	X	X	X	-	X

represents which parameters are met by the individual framework and the proposed framework. Therefore, these investigations will support building up a verified framework to support current ICT industries.

Parameter 1 (key characteristics of ICT projects): Every project may dissimilar with each other but they have some common characteristics. A project is a unique, temporary and progressive endeavour made to provide tangible or intangible outcome such as a product, benefit, service, reasonable advantage, etc. Key characteristics means that every project has a finite start and an end. The successful delivery of the product or service defined the end of project. Coordination of the tasks, planning, resources and execution is the focus of project governance (Songer and Molenaar, 1997). Key characteristics of projects are a unique solution, project has boundaries, so its extent is defined, project is a one-time effort, usually requiring finite resources, project has a committed budget that must be respected, there are distinct start and end dates for projects, you know when you have reached the end of the project (Table 1).

Parameter 2 (ICT project phases): Every project works throughout a course of project lifecycle. To produce a product or service, mandatory tasks of a project described by project lifecycle. Lifecycle defines how to manage the project and it differs for specific project types. Different project have different processes according to the project lifecycle.

In the initiation phase, an individual propose to create or develop a product or a service that can be a need or solving a problem in the performing organization. Moreover, performing organization starts to plan in more depth. The business case has revised and re-evaluated to make the decision and commit the necessary resources

based on the completed planning document for project execution and control. Most of the resources applied on the project execution phase. A significant number of team members will join and execute the primary task of the project. Control phase is to facilitate the team execute the tasks to develop the product or service on the defined schedule. In closure, the outcomes of project team performance and organization performance have assessed. This step accomplished through customer feedback, team member and stakeholders (Table 2) (Nie *et al.*, 2008).

Parameter 3 (success factors of ICT governance): To gain the greatest value from improving how your organization delivers services to the business, it is important to map out the type and level of governance appropriate for your specific needs and initiatives. To significantly improve the likelihood of success for your IT operations, your company should consider the following ten key elements of governance (Table 3) such as guiding the coalition of executive support; communication, training and education; governance structure; transparent workflows; measurement and reporting; a process for managing scope changes; clearly defined roles and responsibilities; a good quality assurance resources; careful risk management; good communication methods (Rivard, 2014).

Parameter 4 (characteristics of good project governance): According to studies, >0% of investors now are willing to pay a share price premium for well-governed organizations. Why? Bcause governance addresses the needs to establish structure, hierarchy, sponsorship, ownership, accountability and communication to support enhanced consistency in execution, ownership and delivery.

Table 3: Evaluation of frameworks based on Success factors of ICT governance

Success factors of ICT governance	Framework				
	ITIL	Cobit	Prince2	AS/NZS 8016	Proposed framework
Guiding the coalition of executive support	X	X	X	-	X
Communication, training and education	X	X	X	-	X
Governance structure	X	X	X	X	X
Transparent workflows	-	-	-	-	X
Measurement and reporting	-	-	-	-	X
A process for managing scope changes	X	-	X	X	X
Clearly defined roles and responsibilities	-	-	-	-	X
A good quality assurance resources	X	X	X	X	X
Careful risk management	X	X	X	-	X
Good communication methods	X	X	X	X	X

Table 4: Evaluation of frameworks based on good project governance

Good governance	Framework				
	ITIL	Cobit	Prince2	AS/NZS 8016	Proposed framework
Sponsorship and accountability	-	X	-	X	X
Transparent with well-defined communication channels	X	X	X	XX	-
Responsive, effective and efficient governance	X	-	X	-	X
Participatory, equitable and inclusive governance	X	X	-	-	X
Governance should follow a rule of law	X	X	X	X	X

Some contextual factors are involved for project failure. Sponsor governance and support breakdown are two factors behind this failure. The affected team member can directly access the information by such decisions and the enforcement. Accountability cannot be enforced without the transparency of the well-defined communication channels. In transparency enough information is provided in clear and concise forms through the accurate medium of communication.

Good governance should maintain the process and the institution by serving in responsive, efficient and effective manner. Good governance should maintain the participation as a key factor and needs to be communicated and organized. The participants are PMO, project manager, sponsor, middle management, partners and customers, third party good governance involves with fair legal frameworks during the decision making process and law of land that are enforced impartially (Table 4).

In this study, the interview with senior project managers at the Northern Territory Government (NTG) of Australia has taken place based on their best practices and how to establish a suitable governance framework. The discussion has taken place on face to face. Three project managers participate to discuss their governance experience for this research. Two categories of discussion have been done to evaluate the current situation of the governance environment based on the best practices of project managers and setting up the project governance framework.

Project governance according to project manager's best practices: Three project managers participate on to discuss about project governance and the first PM is marked as blue, the second PM is marked as red and the third PM is marked as green. The graph (Fig. 3) illustrates result of the discussion based on the following topics: success factors considering by project managers for completing the project; number of projects that project managers has managed in the past 5 years; number of projects involvement by the project managers from initiation to roll out; project managers consider themselves more of a technical or functional PM; expert level of project managers within project or program management; failure factors considering by the project managers while working on a project; project managers natures on managing projects in the last 5 years; project management tool (s) are using by the project managers in past projects; project governance methodology where the project managers having extensive experience within the framework.

Setting up project governance framework: NTG senior project managers explained about their experience how they set up their governance framework while running a project. The graph (Fig. 4) represents the based on the conversation of following topics: project governance framework helps to control complex or high value/high risk projects; the governance structure is clear in terms of communication/reporting lines as well as roles and responsibilities; roles and responsibilities have approved
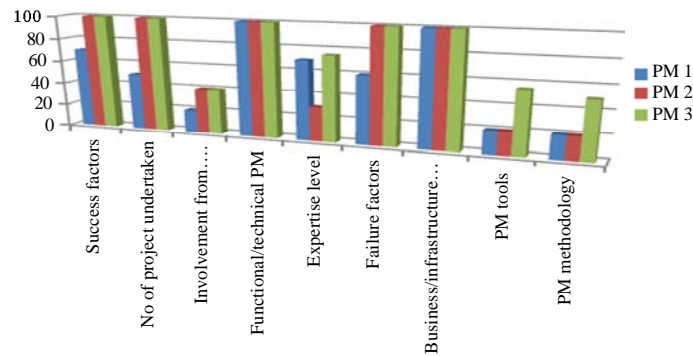
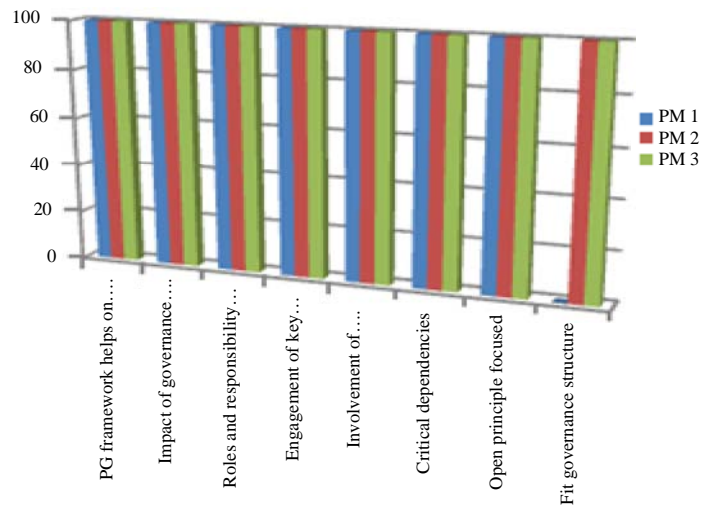Fig. 3: Project governance according to project manager's best practices

Fig. 4: Setting up a project governance framework

by the steering committee in terms of reference and nominated chair (project sponsor); the project governance framework has fulfilled gaps of the organisation that may arise in terms of project categories; the need of key stakeholder's engagement has been effectively addressed by project governance structure; if any project involves with multiple agencies, do all agencies been determined the lead and supporting role, controls and accountabilities of the project; previous projects often maintain close relation with another project and were requiring joint consideration of critical dependencies that addressed in the governance arrangements; organizations have open culture focused on achieving excellence through meaningful ownership and accountability structures and the governance structure is fit for purpose as the investment progresses in terms of support roles and future transitioning.

CONCLUSION

In this research, critical review on previous literature on related problems has delivered, analysed by using creative approach to find out the possible solutions. Research findings are critically evaluated with possible explanations to discuss about the limitations, uncertainties and research significance. The researchers adopted independent and professional approach to research, writing, initiative demonstration and good skills of time management.

To ensure effective governance by good value from their investments and mitigating ICT-related risks, the research investigates on the success and failure factors related with governance frameworks to find out the failure area. To evaluate the proposed and existing framework, four sets of parameters were listed. Discussions with government project managers was arranged to investigate deeply to identify the approach to set up and evaluate ICT governance framework.

In most cases, suitable framework is not available therefore modification of framework may have to prepare to deliver the project successfully. The success of ICT projects are measured based on budget, timing, scope, quality, customer satisfaction and the project team satisfaction.

SUGGESTIONS

In future, more research will be done on this particular problem to find out if better solution can bring into front. More investigation on the current trends, finding out success factors, failure factors, arranging more meetings can be taken place in future with expert project managers to apply the proposed framework to their experience and expectations while governing their projects. Additional research such as what are the scopes of recent project governance, characteristics of latest successful projects, what types of standards are following, role of governance in project management, improvement of proposed methodology if needed and proposing the framework to organizations for applying on their ICT projects and evaluate the outcomes.

ACKNOWLEDGEMENTS

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