

IT GOVERNANCE FRAMEWORK FOR E-GOVERNMENT INITIATIVES

Subarmaniam Kannan^a, Emaliana Kasmuri^b, Peter Woods^c

^{a,b}*Faculty of Information Science & Technology, Multimedia University*

Email: subar.kannan@mmu.edu.my, ^a emaliana.kasmuri@mmu.edu.my,^b

^d*Knowledge Management Centre, Faculty of Creative Multimedia*

Email: p.woods@mmu.edu.my

ABSTRACT

As the penetration of electronic commerce (e-commerce) and electronic business (e-business) occurs in our daily lives, the overall stakeholders of economic growth, including private sector enterprises, governments and society as a whole are beginning to realize the true potential of information technology (IT) and the internet. While the private sector has always ensured that they keep in line with emerging trends, now governments around the globe are also aiming to ensure that all public sector products and services are offered online. Many citizens have a minimal understanding of how government processes are executed or how decisions are made. This lack of awareness and trust can prevent the citizens from actively participating in government services. Thus, E- government security and assurance has become a serious concern of the citizens and private companies who put more reliance on the distributed computing processes in their daily operations. In order to make citizens and private organizations to trust and involves in e-government services, IT Governance should be implemented. As the IT Governance Institute defined that IT governance is the responsibility of the board of directors and executive management. It is an integral part of enterprise governance and consists of the leadership and organisational structures and processes that ensure that the organisation's IT sustains and extends the organisation's strategies and objectives. This paper presents an IT governance framework for e-government and introduces an assessment tool designed to measure its effectiveness. The framework builds on the integration between the structural and processes perspectives of IT governance, public services-IT alignment, and senior government executives' needs.

KEYWORDS

E-Government, IT Governance, COBIT,

1. INTRODUCTION

The rapid changes in the development of the World Wide Web have considerable impact on the implementation of web based technologies in the business environment such as business-to-business (B2B) and business-to-consumer (B2C) area. The adoption of web-based technologies to deliver government services has become a global trend in public administration. These trends have also gaining attention in government sectors notably as government-to-business (G2B) and government-to-citizen (G2C)(Davison et al. 2005).

A survey on e-government shows that 60 per cent of respondents agreed that allowing citizens to use internet to register their cars, pay parking tickets, fill out forms and apply for permit will able increase government agencies effectiveness. Even 50 per cent like the idea of allowing citizens to vote online and have government auctions online(James 2000).

E-government plans are aimed at using new technologies to facilitate inter and intra-agency communication and cooperation, as well as provide information and services to its citizens more efficiently. The programme relies on four foundations: introduction of e-services; infrastructure development; education and training; and legal change. It focuses on the following broad objectives: Increasing information accessibility; Improving government performance and efficiency; reducing costs; enhancing the competitiveness of government; ensuring transparency and visibility; promoting the ICT sector; e-skilling the public sector; and boosting e-commerce activities.

An e-government strategy is a fundamental element in modernising the public sector, through identifying and developing organisational structure, the ways of interactions with citizens and business, and

reducing cost and layers of organisational business processes. It provides a wide variety of information to citizens and businesses through internet. However, the role of e-government is not only to provide information and services to citizens, which could be provided by commercial firms. E-government can develop the strategic connections between public sector organisations and their departments, and make a communication between government levels (e.g. central, city, and local). This connection and communication improve the cooperation between them through facilitating the provision and implementation of the government strategies, transactions, and policies, and also better use and running of government processes, information, and resources(Heeks 1999) Governments can also transfer funds electronically to other governmental agencies or provide information to public employees through an intranet or internet(Tyndale 2002). Thus, e-government has improved communication between different parts of governments so that people do not need to ask repeatedly for the same information from different services providers.

Through an integrated web-portal, it will be possible for citizens and businesses to complete a transaction with government agencies without having to visit several separate ministries/departments in separate physical locations. In addition, government strategy is enabling public sector organisations to interact directly and work better with businesses, irrespective of their locations within the physical world. This includes digitising procurement services from and to businesses in order to improve their service quality, convenience, and cost effectiveness (McClure 2000).

Accordingly, government leaders and officials are increasingly aware of the potential of e-government to improve the performance of government organisations and provide potential benefits to their citizens and business partners. However, adoption of e-government is not straightforward and cannot be done in a limited period time, rather it requires an integrative architecture framework approach to place government information and services online. This is one of the reasons why many government organisations are still in the infancy stage of e-government adoption. Another important reason for this delay is that e-governments require significant changes in organisational infrastructure, which, in turn, can engender resistance. It is a result of these reasons why the authors develop an integrative architecture framework for e-government adoption.

This paper presents an IT governance framework for e-government and introduces an assessment tool designed to measure its effectiveness. The framework builds on the integration between the structural and processes perspectives of IT governance, public services-IT alignment, and senior government executives' needs. This paper is organized as follows: Section 2 highlights current issues in e-government initiatives. Section 3 describes in detail IT governance for e-government. Section 4 discusses how COBIT framework can be used as IT governance tool for e-government. Section 5 discusses the tools provide in COBIT to measure the effectiveness of IT governance framework implementation and finally section 6 concludes this paper.

2. ISSUES IN E-GOVERNMENT INITIATIVES

Many e-government initiatives are in their strategic phase of implementation (infancy), however, some key problems and barriers are already beginning to emerge. There are a number of barriers experienced in public sector organisations that prevent the realisation of anticipated benefits and degrade successful adoption of e-government projects. Since, in general, e-government is about the deployment of a complex ICT infrastructure, it faces a number of risks in relation to implementation, project management and policy, all risks that have to be appropriately managed(Heeks 2004).

In order for the Internet to be accepted as a viable platform for e-government it is necessary to establish a foundation of trust among the participants. Trust is, of course, also important in the context of traditional commerce and has been developed over time through the formation of appropriate policies, procedures and practices to safeguard transactions and government assets. However, a comparable safety net is not yet fully established for e-government over the Internet. Furthermore, because of the global nature of the Internet as a public network, the issue of trust has even greater importance than in traditional commerce because:

- ◇ The party being dealt with may be unknown;
- ◇ It is not possible to have full control of the data during their transfer (for this reason, some people use the Web to locate products but prefer to place their order via telephone or fax);
- ◇ The other party might be at a different and unknown physical location and, therefore, might have different rules and legislation.

It is necessary to facilitate a complete trustworthy relationship among the trading partners within e-government context (Ratnasingham 1998). In order to achieve this, a number of requirements must be

satisfied: if the other party is not known directly, then there needs to be the additional involvement of someone else known to both sides (i.e. a third party who can be trusted); data need to be secured at all stages;

Technology itself would not guarantee success with e-government but, it is necessary that any e-government initiative must ensure that it has sufficient resources, adequate infrastructure, management support, capable IT staff, and effective IT training and support. Despite the cost of IT going down, an adequate IT infrastructure still represents the key barrier for e-government adoption. The infrastructure is composed of hardware and software that will provide secure electronic services to citizens, businesses, and employees. Bonham states that governments view a lack of technical infrastructure as a significant barrier to the development of government organisations' capabilities to provide online services and transactions. He also agrees that unreliable IT infrastructure in public sector organisations will degrade e-government performance (Bonham et al. 2001). Gefen shows that one of the most significant barriers for implementing e-government applications is computer security, privacy and confidentiality of the personal data (Gefen et al. 2002).

Furthermore, as organizations such government agencies become increasingly dependent on IS for strategic advantage and operations, the issue of IS security also becomes increasingly important. Thus, security concerns are crucial factor for e-government success. Public administration must invest in IS security to prevent abuses that can lead to competitive disadvantage (Kankanhalli et al. 2003).

Gupta states that organizations with stronger top management support were found to engage in more preventive efforts than organizations with weaker support from higher management (Gupta 2005). Financial organizations were found to undertake more deterrent efforts and have stiffer deterrent severity than organizations in other sectors. Moreover, greater deterrent efforts and preventive measures were found to lead to enhanced IS security effectiveness.

3. IT GOVERNANCE FOR E-GOVERNMENT

E-government allows an unprecedented ordering of transactions within the administration and between the administration and outside institutions, firms and individuals (citizens as customers). This is part of a wider shift whereby citizens become customers, as recommended by the new public management movement (Davison et al. 2005). Thus, government administration should adopt a business approach, the rationale for protecting information systems can be obtained by examining the consequences of loss arising from the lack of security in information systems. Creating and implementing a comprehensive new IT strategy is a pervasive challenge for e-government initiatives (Ban and Heng 1995). Thus, IT Governance becomes the key factor for making e-government projects successfully implementation and continuous monitoring.

The Information Technology Governance Institute defines IT governance as "the leadership, organizational structures, and processes that ensure that the enterprise's IT sustains and extends the enterprise's strategies and objectives". Additionally, they state that "While governance developments have primarily been driven by the need for the transparency of enterprise risks and the protection of shareholder value, the pervasive use of technology has created a critical dependency on IT that calls for a specific focus on IT governance" (ITGI 2006). IT Governance reflects broader corporate governance principles (OECD 2004). Corporate Governance and IT Governance both pursue an ongoing questioning of the organisation's governance model's sufficiency in minimising risks and maximising returns (Hamaker and Hutton 2004). IT governance may also be defined as specifying the decision rights and accountability frameworks to encourage desirable behaviour in using IT (Peter Weill and Ross 2004).

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PricewaterhouseCoopers Brussels conducted a research about the IT governance environment and marketplace for the IT Governance Institute (ITGI) in 2006 (ITGI 2006) shows that

- ✧ More than 93 per cent of business leaders recognise that IT is important for delivering the organisation's strategy.
- ✧ Organisations are suffering from IT operational problems.
- ✧ CIOs recognise the need for better governance over IT.
- ✧ IT governance frameworks are used to align IT strategy and manage IT operational risks.

❖ Good IT governance helps organisations provide IT value and manage IT risks. COBIT is the preferred way to implement effective IT governance.

Figure 1 show that IT governance is an essential for public sector as IT is regarded as important factor for overall strategy delivery in organisation's success.

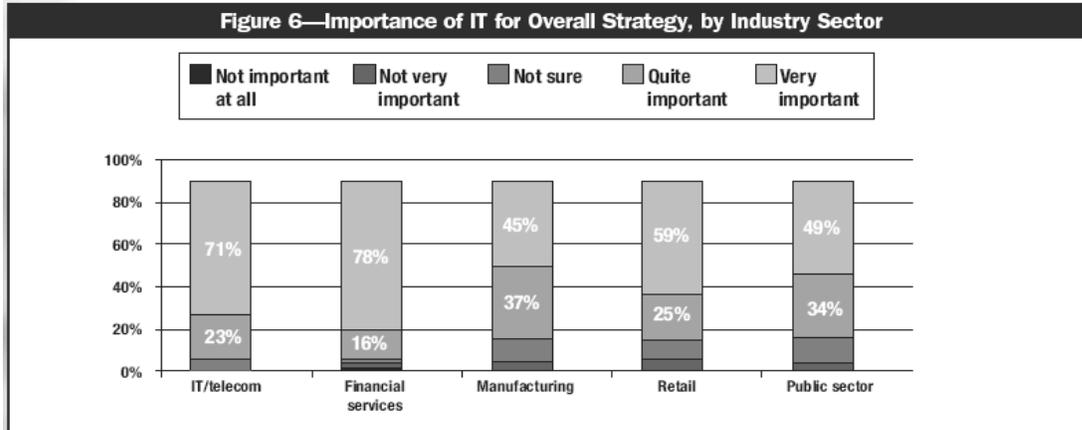


Figure 1. Shows the importance of IT for Overall Strategy Delivery, by Industry Sector (ITGI 2006)

A variety of standard IT governance frameworks and different assessment methods for evaluating IT impact and performance has emerged such as Information Technology Infrastructure Library (ITIL), Control Objectives for Information and Related Technology (COBIT), Application Services Library (ASL), Six Sigma (Six sigma stands for Six Standard Deviations from mean), The Capability Maturity Model (CMM), Statement on Auditing Standards, No. 70 (SAS70), The ISO 17799 or the counterpart of British Standard BS 7799 and, Projects IN Controlled Environments (PRINCE). De Haes and Van Grembergen W show that IT governance consists of various structures, processes and relational mechanisms shown in Figure 2 (Haes 2006).

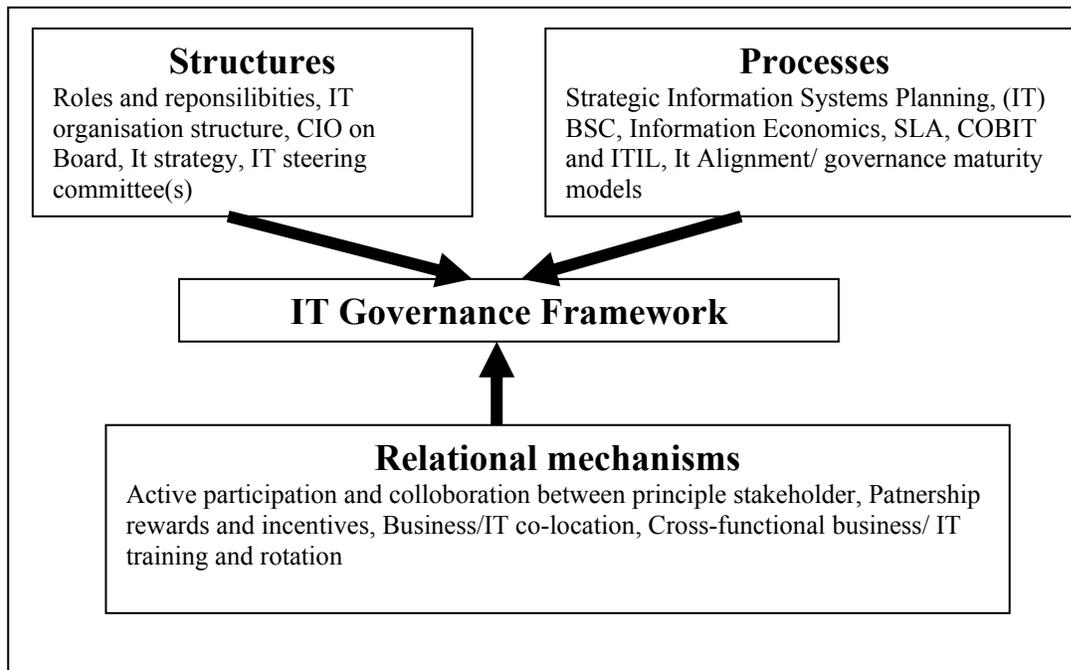


Figure 2. Necessary Elements of IT Governance Framework after (Haes2006)

Structures involve the existence clearly defined roles and responsibilities and a diversity of IT/business committees such as IT steering committees and an IT strategy committee. Typically such an IT steering committee is situated at executive or management level and has the specific responsibility for overseeing major projects or managing IT priorities, IT costs, IT resource allocation, etc. The IT strategy

committee on the other hand operates at board level and is more concerned about making sure that the board is involved in IT matters(ITGI 2006).

Processes refer to strategic decision making, strategic information systems planning and monitoring via e.g. the IT balanced scorecard monitoring, service level agreements (SLA) (and control and process frameworks such as Control Objectives for Information and Related Technologies (COBIT) (ITGI 2006) and Information Technology Infrastructure Library (ITIL).

The relational mechanisms finally are crucial in the IT governance framework and paramount for attaining and sustaining business-IT alignment, even when the appropriate structures and processes are in place(Luftman 2000). These mechanisms include business/IT participation, strategic dialogue, training, shared learning and proper communication. This triple component covered by COBIT framework to provide a suitable IT governance for e-government processes.

4. COBIT FRAMEWORK AS IT GOVERNANCE TOOL

We proposed a COBIT framework as IT Governance tool for E-government. COBIT stand for Control Objectives for Information and related Technology, first released in 1996, is an IT governance tool that has changed how IT professionals work. Now in its 4th edition, it provides good practices for the management of IT processes in a manageable and logical structure, meeting the multiple needs of e-government by bridging the gaps between business risks, technical issues, control needs and performance measurement requirement. COBIT is a business oriented framework that identifies 34 information technology processes, grouped in 4 domains, and is supported by 318 detailed control objectives.

COBIT is based on the conviction that organisations must satisfy the quality, fiduciary and security requirements for their information, as they do for all assets. Management must also optimise the use of available resources, including data, application systems, technology, facilities and people. To discharge these responsibilities and to achieve their objectives, management must understand the status of their own IT systems and decide what security and control they should provide.

The COBIT framework helps meet the multiple needs of management by bridging the gaps amongst business risks, control needs and technical issues. It provides good practices across a domain and process framework and presents activities in a manageable and logical structure. COBIT's good practices reflect consensus of the experts, help optimise information investments and provide a measure to judge against if things do go wrong. COBIT starts from the premise that IT needs to deliver the information the enterprise needs to achieve its objectives. In addition to promoting process focus and process ownership, COBIT looks at fiduciary, quality and security needs of enterprises and provides seven information criteria that can be used to define generically what the business requires from IT: effectiveness, efficiency, availability, integrity, confidentiality, reliability and compliance.

The Framework explains IT processes deliver the information that the business needs to achieve its objectives. This delivery is controlled through 34 high-level control objectives, one of each IT process, contained in the four domains. The framework identifies which of the seven information criteria (effectiveness, efficiency, confidentiality, integrity, availability, compliance and reliability) as well as which of IT resources (people, applications, technology, facilities and data) are important for the IT processes to fully support the business objectives. The four domains identified as building blocks of COBIT framework as shown in Figure 3: Planning and Organization, Acquisition and Implementation, Delivery and Support Monitoring and Monitoring.

The integration of COBIT framework into e-government processes can be achieved by mapping IT processes and business process in e-government and with COBIT 34 high-level control objectives. The e-government processes need to be aligned with IT processes to create an integrative IT governance framework, which incorporates the structure and process perspectives of IT governance. Hamaker (Hamaker and Hutton 2004) divided the antecedents of business-IT alignment into overall organization, IS organization, IT investment and external factor items. They proposed that these antecedents impact how IT is organized through business-IT alignment. Besides, Boards and C-level executives (CEO, COO, CFO, etc.) have important roles in IT governance. (Peter Weill and Woodham 2003) proposes that they are the five key IT decisions from IT principle to IT investment prioritization. The IT Governance Institute's COBIT board briefing identifies five IT governance focus areas, which are strategic alignment, value delivery, risk management, resource management, and performance measurement (COBIT 2005).

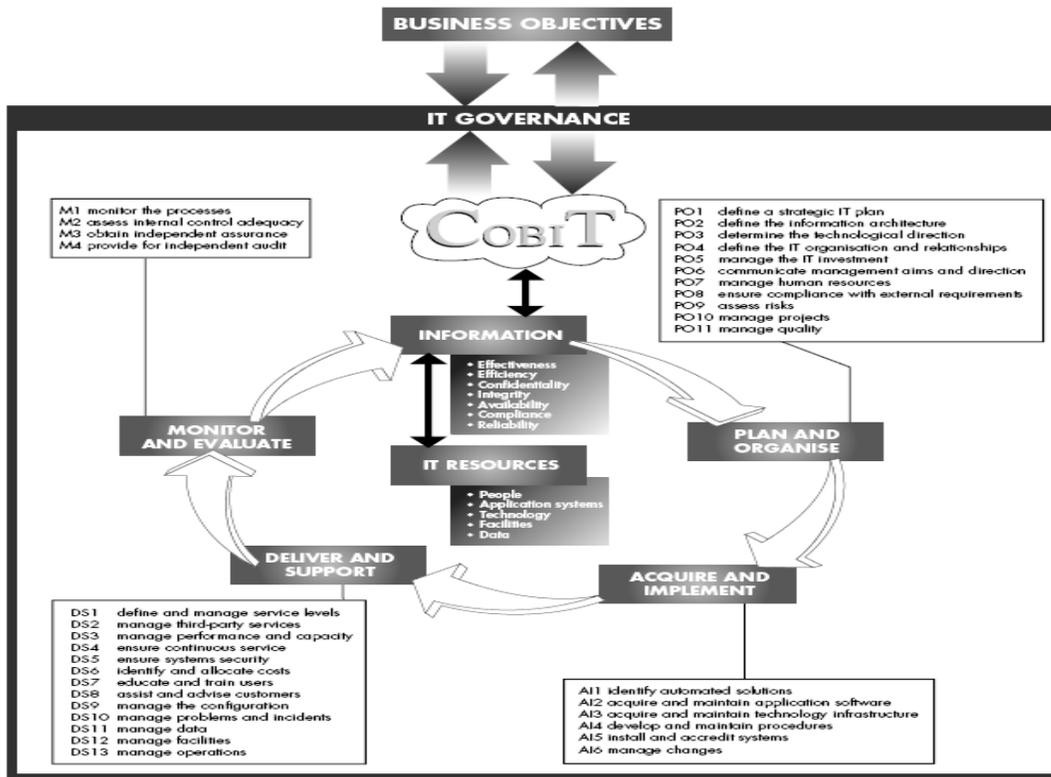


Figure 3 COBIT Framework (COBIT 2005)

5. MEASURING IT GOVERNANCE EFFECTIVENESS

In order to ensure that management reaches its business objectives, it must direct and manage IT activities to reach an effective balance between managing risks and realising benefits. To accomplish this, management needs to identify the most important activities to be performed, measure progress towards achieving goals and determine how well the IT processes are performing. In addition, it needs the ability to evaluate the organisation's maturity level against industry best practices and international standards. To support these management needs, the COBIT Management Guidelines have identified specific as shown in Figure 4 - Critical Success Factors, Key Goal Indicators, Key Performance Indicators and an associated Maturity Model for IT governance.

Key Goal Indicators representing the process goal is a measure of "what" (goals) has to be accomplished in order to achieve the overall e-government agencies mission and objectives. It defines measures that will tell the public administrator - after the fact - whether their IT process has achieved its business requirements; it is expressed in goals of the following perspectives:

- Cost-efficiency of processes and operations
- Internal processing efficiency.
- Availability of information needed to support the end-user needs
- Learning & Innovating goal to achieve the e-government agencies objectives.

Critical Success Factors working with the e-government agencies to define the most important issues or actions for management to achieve control over within its IT processes. It identifies the most important things that the e-government agencies must do, strategically, technically, organizationally or procedurally.

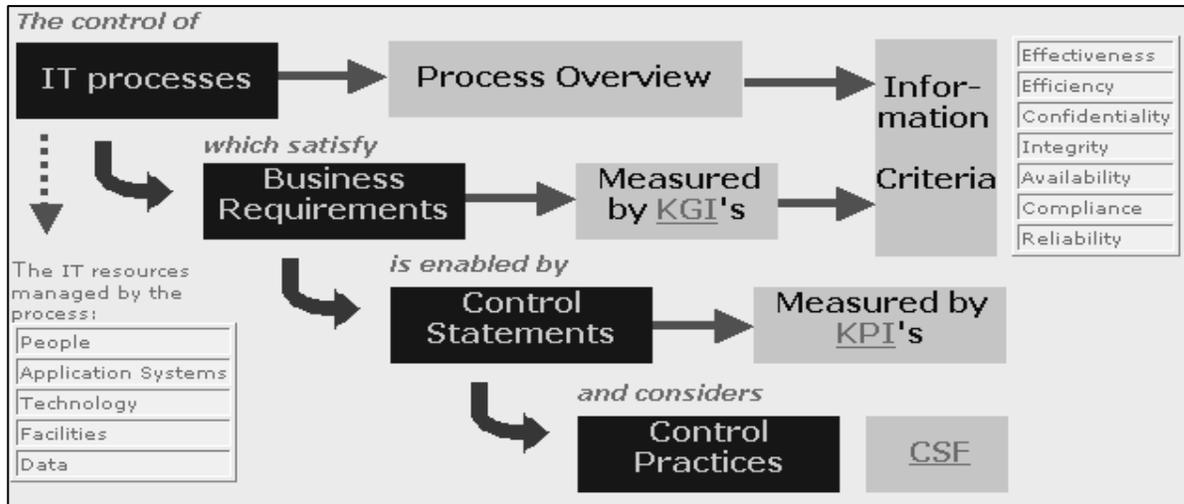


Figure 4 Flowchart of COBIT Governance after (ISACA 2000)

Key Performance Indicators developing measures to determine how well the IT process is performing in enabling the goal to be reached; lead indicators of whether a goal will likely be reached or not and; indicators of capabilities, practices and skills. Key Performance Indicators are short, focused and measurable indicators of performance of the enabling factors of the IT processes, indicating how well the process enables the goal to be reached. They will often be a measure of a Critical Success Factor and, when monitored and acted upon, will identify opportunities for the improvement of the process. As per COBIT's Management Guidelines, the Critical Success Factors, Key Goal Indicators and Key Performance Indicators are short and focused. This complements the high-level control guidance provided by the COBIT Framework which states that IT enables the business by delivering the information the business needs.

6. CONCLUSION

Trust among key participants of e-government must be established as to make Internet a viable platform for e-government. E- Government security and assurance has become a serious concern of the citizens and private companies who put more reliance on the distributed computing processes in their daily operations. In order to make citizens and private organizations to trust and involves in e-government services, IT Governance should be implemented. As the IT Governance Institute defined that IT governance is the responsibility of the board of directors and executive management. It is an integral part of enterprise governance and consists of the leadership and organisational structures and processes that ensure that the organisation's IT1 sustains and extends the organisation's strategies and objectives. The COBIT framework helps meet the multiple needs of management by bridging the gaps amongst business risks, control needs and technical issues. It provides good practices across a domain and process framework and presents activities in a manageable and logical structure. Beside, COBIT also provides a comprehensive evaluation methodology using Critical Success Factors, Key Goal Indicators, Key Performance Indicators and an associated Maturity Model for IT governance.

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