

A Practical Service in Assuring and Managing e-Government Projects

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Abstract— IT projects have high failure rates due to incomplete system requirements, rapidly-changing technology, unmanaged risks and poor communication between customers and service providers. Government organizations are increasingly dependent on information systems to carry out their operations, to improve the productivity of work and to deliver the government services to the citizen. IT project failures in government may endanger national security, citizens' lives, privacy and property. The authors present the issues of IT projects and a practical service in assuring and managing e-Government project in Korea.

Keywords— IT Audit, e-Government, Assurance, Advisory service, IT Project Management

I. INTRODUCTION

Government organizations are increasingly dependent on information systems to carry out their operations, to improve the productivity of work and to deliver the government services to the citizen. As a consequence, the number of IT projects to develop and operate these information systems is also increasing, and the reliability of computerized data and security of the information systems are a major concern in the public sector.

IT project failures in government may endanger national security, citizens' lives, privacy and property. For example, failures in military systems may lead to a collapse of national defence. Malfunctions in air traffic or railroad traffic control systems can lead to hundreds of fatalities. Also, data leaks in health information systems may infringe upon personal privacy. These failures in IT projects are common in many countries around the world. Almost all IT projects confront some of these factors, but they are not unavoidable. If those factors are identified at the planning stage and are well managed, IT projects can be completed successfully.

The study focuses on the issues of IT project assurance in public sector and IT audit service in Korea. With the benefit

of IT audit, the success rate of IT projects can be dramatically increased. In addition, the early detection of faults can have a huge positive impact on total lifecycle costs of information systems. Our study reviews the IT audit framework and attempts to suggest further study of it.

II. BACKGROUND AND RELATED WORK

By leveraging the world's best information technology, Korea has actively and successfully established e-Government systems including Electronic Customs System, e-People, Electronic Procurement System and others to make its government more competitive. The 2010 UN Global e-Government Survey shows that Korea ranked first among all the member countries, given the highest possible scores in the categories of e-government development index and the online participation index.

One of the secrets of its outstanding achievement is the practical and institutional support in managing and assuring IT projects. Among them, 'IT Audit +' (a brand name of Audit, Assurance and Advisory services for the public IT projects in Korea) greatly contributed to the successful implementation and operation of Korea's e-Government.

IT Audit+ is a unique policy implemented in Korea since 1980's. It is based on the e-Government Act, IT Audit+ guideline and 46 IT Audit+ manuals that are depending on the project type, audit phase and audit domain. For the further improvement, there should be continuous study on the various aspect of IT audit framework, the effect verification of audit results, IT assurance practice of foreign countries and survey on the customer satisfaction of IT audit.

A. Issues in IT Projects

IT projects have high failure rates due to incomplete system requirements, rapidly-changing technology, unmanaged risks and poor communication between customers and service providers.

Typical IT project failures include one or more of the following features:

- The project does not meet the due date or planned budget.
- Some key functions are omitted from delivered system or do not perform properly.
- Immature technology has been adopted, leading to incompatibility with other legacy systems.
- All specified functions have been implemented, but end-users do not use most of them.
- Delivered systems have insufficient or excessive capacities, which preclude the efficient use of IT resources.
- Frequent system failures result in degradation of the organization's public reputations.
- Systems fail to prevent unauthorized access of critical information.

Furthermore, even when IT projects were completed, more than a quarter of the projects do not deliver all of the specified functions that were originally set to deliver.

B. Drawbacks of Related Work

Various management tools have been developed, mainly from the software engineering field, in order to perform IT service management and control. The tools are often referred to as IT guidelines. Different forms of IT guidelines have been developed with distinctive purposes by many international organizations and groups. Typical IT guidelines are PMBOK, COBIT, ITIL, CMMI and SPICE.

In most cases, IT guidelines were initially developed for a specific management purposes and were expanded later to broader areas. Coverage of these guidelines has been extended to increase effectiveness of management and control. However, it was difficult to manage and assure the comprehensive Korean e-Government projects with those distinctive guidelines. IT Audit⁺ has several distinctive features compared to other IT guidelines. It provides comprehensive guidance for integrative management, control and audit across all IT service areas. Being integrative means that the guideline is a tool that encompasses entire management processes.

IT Audit⁺ uses both the top-down and the bottom-up approach for analyzing IT governance and delivering solutions. The bottom-up approach can be used to check the system development process and execute functional tests, and the top-down approach used to derive overall problems and solutions of the organization and environments. That is where IT audit framework in Korea makes a difference.

III. IT AUDIT⁺ SERVICE

IT Audit⁺ helps project owners and service providers to detect and manage risks and problems of IT projects in order to improve the effectiveness, efficiency and security of information system. Through systematic and professional procedures of obtaining evidence and evaluating the process and product of IT projects by highly qualified IT auditors, potential risks can be detected and managed at an early stage.

A. IT Audit⁺ Framework

IT Audit⁺ framework comprises of three dimensions: project type/audit phase, audit domain and audit perspective. IT Audit⁺ framework is shown in Figure 1.

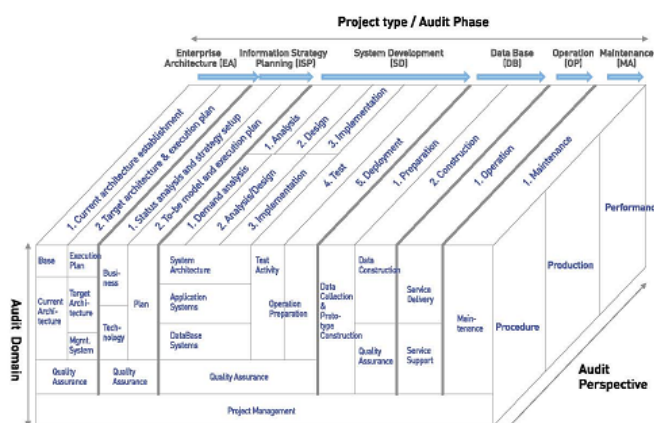


Figure 1. IT Audit⁺ framework

B. Typical Project Type, Audit Phase and Domain

For example, if it is a system development project, it usually is audited three times including the end of the analysis, design and test phase of each audit domain. Typical sample of IT Audit⁺ is shown in Figure 2.

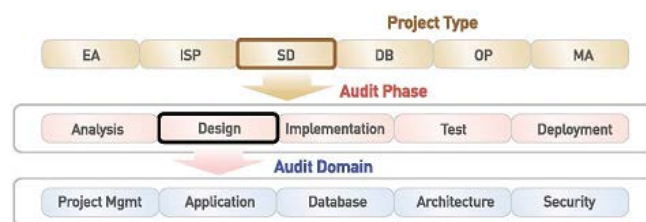


Figure 2. Typical sample of IT Audit⁺

C. IT Audit⁺ Service Types and Scope

IT Audit⁺ service includes audit, assurance and advisory activities. It assesses project management, process, product and performance of IT projects. IT Audit⁺ service types and scope are shown in Figure 3.

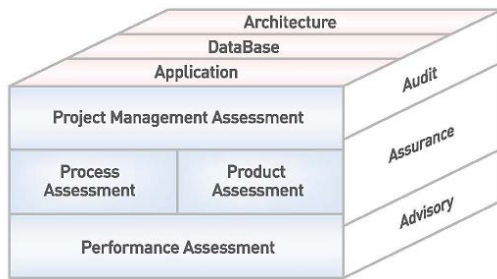


Figure 3. IT Audit⁺ service types and scope

There are three service types in IT Audit⁺ service.

- First, Audit service means; Auditors review and verify the project deliverables to determine the compliance with rules, guidelines, standards and planned project scope. In the planning and development phase, we verify whether project plan and deliverables properly reflect planned project scope. In the completion phase, the final audit report is presented.
- Second, Assurance service means; Auditors provide assurance about the quality and reliability of the information system in accordance with audit criteria and user requirements. An appropriate development methodology and management process is required for systems to reach quality goals in performance and functionality. System quality should be improved through constant quality control over intermediate and final deliverables. Also, evaluate level of compliance with the initial planned process and assess constancy of deliverables.
- Third, Advisory service means; As a certified expert, an auditor can provide advice on potential risks and relating issues to support the successful implementation and operation of the information system. With the knowledge and expertise on project management acquired from the e-Government projects, auditor provides solutions that best fit business environment and project characteristics. Auditors are proven and knowledgeable experts, and they provide advice on technical standards, guidelines, and/or technical issues. They also detect potential risks and help take timely measures. If a project is large-scale or highly complex, or requirements are too broad or indefinite, the auditors will support and coordinate communication between project owner and vendor.

There are four service scopes in IT Audit⁺ service.

- First, Project management assessment means; Evaluates project management activities, identifies issues related to project management, and provides advice on corrections needed in each phase of the project.

- Second, Process Assessment means; Assesses the appropriateness of methodologies used by service provider, evaluates the process activities in each audit domain, identifies issues and provides advice on corrections needed.
- Third, Product (Deliverables) Assessment means; Evaluates both intermediate and final deliverables at the end of each phase, and verifies compliance of rules, guidelines and technical environments of the deliverables.
- Fourth, Performance Assessment means; Reviews the performance indicators to find out the fulfillment of project requirements and the post-project performance indicators.

D. Qualification of IT Audit⁺ Professional

Qualification requirements for a licensed professional are set by the Korean government. They include an appropriate level of IT-related expertise, experience and education. There are two classes of a licensed auditor: “Principal Auditor” and “Auditor”. Only a “Principal Auditor” is allowed to be a “Lead Auditor” in an audit team.

To be a ‘Principal Auditor’, one must have at least 9 years of experience in the IT industry and pass the “Certified IT Auditor Exam”, which tests the knowledge areas of project management, software engineering, database, architecture, information security and new IT technology.

E. Typical Activities and Major Deliverables

Typical activities performed in IT Audit⁺ and major deliverables are shown in Figure 4.

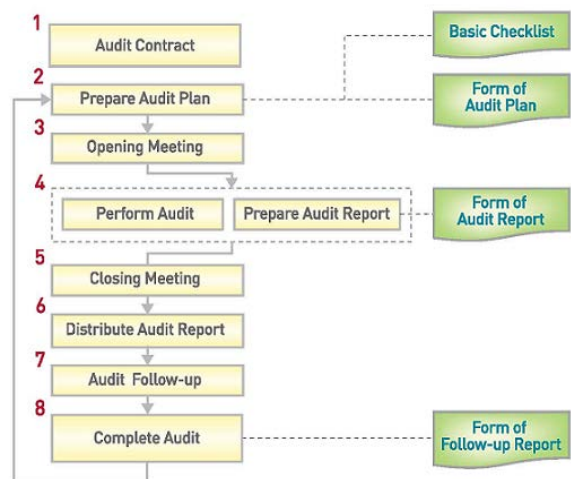


Figure 4. Typical activities performed in IT Audit⁺ and major deliverables

F. IT Audit⁺ Service Roles and Responsibilities

Audit client is an organization or a person requesting an audit, auditor is an audit team or a person who conducts an audit and auditee is the service provider being audited. Roles and responsibilities are shown in Figure 5.



Figure 5. Roles and responsibilities of IT Audit⁺

G. Benefits of IT Audit⁺ Services

IT Audit⁺ is an independent and professional service that helps project owners and service providers detect and manage risks in every aspect of an IT project. Expected benefits of IT Audit⁺ can be summarized as follows :

- First, benefits of IT Audit⁺ service of project management domain; Help grasp and manage potential risks at an early stage. Identify the discrepancies between project plan and actual performance. Ensure appropriate system development and operation methodologies and standards are utilized. Facilitate productive communication between project owners and service providers.
- Second, benefits of IT Audit⁺ service of Application and Database domain; Assure all explicit and implicit user requirements are implemented into data or application functions. Assure software functions work dependably and promptly, and are user-friendly. Enhance software maintainability and scalability. Assure proper backup and recovery plans are established.
- Third, benefits of IT Audit⁺ service of System Architecture domain; Assure information technology architecture is aligned with information strategies. Detect and mitigate the risks in adopting immature technologies. Assure that systems conform to the standards. Assure system availability, reliability and performance. Help establish proper IT resource management plans.

- Fourth, benefits of IT Audit⁺ service of Security domain; Identify potential security risks. Assess risk control scheme by reviewing technical and legal safety. Help establish security policy and comply with international security standards.

IV. CONCLUSIONS

IT audit in public sector is a unique policy implemented in Korea since 1980's and it has been greatly contributed to the successful implementation and operation of Korea's e-Government.

IT Audit⁺ is a comprehensive body of knowledge that contains various guidelines and services, and has been refined over 20 years of practice. The first version of IT audit guideline was developed in the 1987, and several improvements to the guideline have been made since then. In addition, top-class professionals and optimized processes are ready to provide a high quality IT audit service, which have been verified and refined in numerous public projects for over a decade. As the benefits of IT audit services were recognized, a more comprehensive IT audit guideline, manuals and checklists were published. In 1997, the agency commenced educational courses for IT auditor candidates. With its successful experience, the Korean government officially launched IT Audit⁺ services in order to help project owners and service providers, a way to detect and manage risks in the early stage for the successful IT projects. We are cooperating with various international and domestic organizations to embrace the technical evolution and improve our IT audit service. We also strive to create a synergy with international IT service models. Lately, we are actively participating in the standard development at the ISO/IEC JTC1/SC7 in collaboration with Japan. In addition, we survey the market and study the level of customer satisfaction of it every year.

There should be further study on the various aspect of IT audit framework, the effect verification of audit results, IT assurance practices and IT guidelines of foreign countries.

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