Introducing Performance Audit of the use of EDP

a list of references

A project within the INTOSAI Standing Committee on EDP Audit

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The Swedish National Audit Office
Preface

The rapid expansion of information technology poses new and different challenges to the audit community. Many SAIs are on the threshold of an interesting and important development while others have worked in this field for several years.

The goal of the INTOSAI Standing Committee on EDP is to support and promote the development and transfer of knowledge, particularly through the exchange of experience. As part of this challenge Working Group II has developed a reference list covering different aspects of performance audit of the use of IT/EDP in a broad perspective. The list, presented in this report, includes references from professional journals as well as from Supreme Audit Institutions engaged in such audits, and forms a basis for the exchange of information and experience between different SAIs.

In March 1995 a seminar on this theme was held in Stockholm. This seminar brought together auditors from different SAIs to discuss and analyse how we should deal with, and prepare ourselves for, the new IT-environment. The proceedings from the seminar were published by the RRV in July 1995.

Together with the proceedings, the reference list represents experience gained hitherto that others can benefit from.

I take this opportunity to express my gratitude to all SAIs that have contributed to this project.

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Auditor General of Sweden

Convener of Working Group II,
INTOSAI Standing Committee on EDP Audit
1. Introduction

In the future ministries as well as agencies and other auditees will use different forms of information technology (IT) to an ever increasing extent, both in the management and the execution of their duties and responsibilities. IT exerts an influence throughout organisations and operations, and introduces new risks which affect the security, costs and efficiency of agencies. Unfortunately there are far too many examples of projects and systems which do not live up to expectations.

Performance Auditing of the use of EDP is an auditing tool for examining the economy, efficiency and effectiveness of an organisation’s activities from an EDP/IT perspective. Today there is a great deal of knowledge possessed by SAIs and other interested parties which have worked for some time in this area. This knowledge should be passed on to others in order that a SAI which has not worked to any great extent in this field does not need to "reinvent the wheel".

The INTOSAI Standing Committee on EDP Audit was formed in 1992 to support SAIs to develop their own knowledge and skills in the use and audit of information technology by providing information and facilities for the exchange of experience, and by encouraging bilateral and regional co-operation. Within this Committee there are three working groups which work with different aspects of audit and EDP. The Swedish National Audit Office (RRV) has been appointed as the convener of Working Group II (Performance Audit of the Use of EDP Systems).

In the Committee it has been observed that there is a great interest among the majority of SAIs to further develop their activities in the field of performance auditing of the use of EDP. At its meeting on October 13, 1993, the Committee discussed different methods of supporting SAIs in this field. The proposal considered best was a reference list of articles, reports and suchlike which would be made easily accessible to all concerned. As the convener of WG 11, the RRV was assigned the responsibility to produce a reference list which would provide an introduction to and guidance in this new and challenging field.
2. Aims of the reference list

The reference list targets project leaders and persons in similar positions who have little experience of performance auditing of the use of EDP and who wish to understand the methods and approaches used in the field. We have focused here on material which provides a general picture rather than specific details; which provides an introduction and basic knowledge rather than an analysis of the most recent or most complicated problems.

On March 14-16, 1995, a seminar was held in Stockholm on "Future Risks and Opportunities in the Field of Performance Auditing of the Use of IT/EDP". The documentation for this seminar provides a picture of the state of the art at those SAIS which have been working for some time with performance auditing of the use of EDP. The proceedings from the seminar can be regarded as complementary to and a next step from this report. The proceedings can be obtained free of charge from the Swedish National Audit Office (RRV).
3. The area of Performance Auditing of the use of EDP

*Performance audit* is defined by the INTOSAI Auditing Standards as "An audit of economy, efficiency and effectiveness with which the audited entity uses its resources in carrying out its responsibilities".

- *Economy* is defined as: "Minimising the cost of resources used for an activity, having regard to appropriate quality". Economy is thus concerned with *spending less* while maintaining the expected quality.

- *Efficiency* is defined as: "The relationship between the output, in terms of goods, services or other results, and the resources used to produce them". Efficiency is thus concerned with *spending well*.

- Finally *Effectiveness* is defined as: "The extent to which objectives are achieved and the relationship between the intended impact and the actual impact of an activity". Effectiveness is thus concerned with *spending wisely*.

Performance auditing of the use of EDP is thus a vast area and there is only partial consensus between different SAI's on what this area should constitute. Different SAI's include different topics in their performance audits of the use of EDP.

Working group II (WG II) within the INTOSAI Standing Committee on EDP Audit, has interpreted performance audit widely. On a general level three levels of analysis are defined:

1. **Performance auditing of EDP/IT systems at different stages of their life cycles.**

   This involves a study of methods and techniques used to examine efficiency and productivity, systems acquisition and systems development. It also covers the implementation of systems, and the maintenance, operation and renewal of systems. Questions relating to quality and security are included here.
2. *Performance auditing of the management of IT.*

This covers the methods and techniques used to examine the way decisions are made on and plans are made for the use of IT, and the quality of basic data used for decision-making purposes. This area also includes performance auditing to examine both compliance with legislation and efficiency in the controls of the use of IT.

3. *Performance auditing of the external and societal effects of the use of IT in government administration.*

This heading covers methods and procedures for examining, among other things, the range and quality of services, and personal integrity issues.

![Diagram](image)

Fig. 1: The three levels of Performance Audit of the use of EDP

Performance Audit of the use of EDP can thus be very extensive. A different demarcation is that performance auditing of the use of EDP ranges from general controls and EDP security to programme evaluation.
4. The Structure of the Report

The references are divided into two parts:
1. Articles from different journals
2. Reports from different SAI's

_The first part_ is based on information retrieval from reference data bases. The collection of material has been based on articles and suchlike. We have avoided including books and conference documentation unless recommended by a SAI.

For practical reasons based on the retrieved articles, the material has been classified as shown below. The classification also provides a picture of some of the main topics in performance auditing of the use of EDP.

The classification is:
- Performance Audit of the use of EDP, general material.
- Evaluation of EDP investments.
- Systems development audit.
- Audit of management of information systems.
- Audit and security.
- Fraud and irregularities.

In each area there is a short introduction which is followed by a selection of references in each field.

The limitation of this type of study is that only the material referred to in the reference data bases used can be obtained. Moreover there is a time limitation. The search made was for material published from 1989 onwards. There is thus good topical material that has not been retrieved.

Furthermore, decisions on the inclusion of material have been based on our own assessments. It is possible that other parties would have made other assessments. Nor have we had the ambition of selecting the best material in any "objective" sense. This is, in practice, impossible.
The second part is based on answers received on reports in the field sent in by a selected number of SAI s. The choice of SAI s which were contacted in this matter was based on the answers received in response to a questionnaire distributed by the SAI of India. This questionnaire concerned the Committee’s project ”INTOSAI EDP directory”. Question C26\(^1\) concerned this reference list project.

We asked the SAI s contacted to make a selection from their own reports etc, which could be of use for the target group of this report.

The project group has not made any assessment of the SAI s' recommendations. The selection has thus rested with each individual SAI.
5. The articles

Performance auditing has been defined by intosai. When reading different articles one finds that there are at least two synonyms of performance auditing; value for money audit and operational audit. In the retrieved articles these terms are used more frequently than performance audit.

The border between performance audit and financial audit is not always clear. One will find articles that touch on both these areas. This is mostly evident in articles that discuss EDP/IT security and fraud and corruption.

One will find that the articles sometimes discuss the issues from the perspective of internal audit. It is also often the case that the articles are oriented toward the private sector. From a methodological point of view this should pose few if any problems. The different methods and points of view are useful regardless of the perspective from which the auditor approaches the issue of performance auditing of the use of EDP.

5.1 Performance audit of the use of EDP, general material:

The articles referred to here provide a broad introduction to this area in relation to information technology, the role of the auditor and how to conduct, in a broad sense, a performance audit of the use of EDP. Some of the articles list quite a few topics that, in their view, are part of the performance auditing of the use of EDP. In most of the articles listed a synonym, value for money, is used.

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C26: Does your SAI have any documentation, report or guideline that would be of value to other SAIs and which you would be willing to share, within any of the three areas mentioned below?

- Performance Audit of IT Systems at different stages of their life cycle.
- Performance Audit of the management of IT.
- Performance Audit of the external and societal effects of the use of IT in government administration.
The references:


5.2 Evaluation of EDP investments

EDP investments are generally considered a high risk area, primarily because there is no "one way" to evaluate the benefits and costs of IT. Traditional concepts such as return on investments (ROI) are not always applicable here. One needs to consider both a cost/benefit analysis (CBA) approach to investments and to incorporate the intangible benefits in the evaluation process. EDP investors tend not to consider risk of investments and invisible or hidden costs. It is also important to be aware of decisions about investments during the systems development process.

These articles serve primarily as an introduction to EDP investments and the organisation's internal evaluation process. They are not specifically oriented towards the auditor, but as an auditor it is essential to be aware of these issues. The auditor's role may also include the role of an EDP investment consultant.
The references


5.3 Systems development audits

One area of significant exposure and audit risk in an organisation’s use of IT is how the system is developed.

There are many different development methodologies which differ somewhat in approach and structure. The articles do however indicate that there are overall similarities in the basic principles of their design philosophy.

From a historical perspective the development process has been broken down into different phases, subject to thorough review and approval before subsequent development projects. This has changed the role of the auditor from "after-the-fact" evaluation to encompass both "before and during-the-fact" participation. This trend is further emphasised by the fact that software maintenance, which refers to all modifications after an application system becomes operational, is
estimated to cost about seventy per cent of the total life-cycle costs of software. This indicates clearly the need of controls.

The references:


5.4 Audit of management of information systems

This section deals with the audit of management involvement in information system operations.

Periodic review of the information systems function is necessary to determine if costs are in line with services provided, if the users are satisfied with services, and if computer power is effectively used to meet the demands of management.

Operating performance can be evaluated against some other specific criteria, such as internal standards or industry standards, or contractual obligations.

Measuring the benefits of reviews of information systems can be difficult. The articles mention some, for example improved workflow, equipment utilisation, and processing reliability, along with
greater adherence to user schedules. This should result in lower costs and a more smooth-running operation.

The references


Belden Menkus, ”Outsourcing may significantly change the nature of information systems auditing”, EDPACS, February 1995, p. 10-16.


5.5 Audit and security

Audit and security areas are considered key issues within the area of edp audits and should be considered during all stages in the life cycle.

The objectives of an EDP security audit can be summarised as the process in which the auditor evaluates the effectiveness of all security procedures that an organisation depends on for preventing, detecting or correcting any data processing errors. A security audit determines that all safety controls, manual and automated, are sufficient to protect, secure, and ensure integrity and reliability of computer data.
The references


5.6 Fraud and irregularities

The number of frauds and irregularities are growing, and consequently the expectations on the external auditor are increasing. Although the audit techniques used to counter computer fraud have progressed rapidly, the fact remains that each year more and more frauds are being perpetrated.

Computer audit professionals can contribute to the detection and prevention of computer fraud and abuse. By applying the basic techniques of systems-based auditing to a review of working practices within the data processing environment, many issues can be identified. In these references the objective of the audit is fraud and irregularities.
The references


6. Reports from Supreme Audit Institutions

In the questionnaire distributed by SAI India on the INTOSAI EDP directory, a question was asked concerning this publication. The answers to the questionnaire and further contacts showed that there were some 15 SAI's which had programmes for the performance audit of the use of EDP, and which had produced reports which could be made available for other SAI's which were interested.

Below is a list of those countries which, at the request of this project, have provided information about their own reports which they feel can be of interest to others. Replies were received from 13 of the 15 SAI's approached. These SAI's are: Australia, Austria, Canada, France, Hong Kong, Israel, Japan, Republic of Korea, The Netherlands, Republic of South Africa, Sweden, The United Kingdom and The United States.

The titles reflect the language the papers, reports etc. are written in. The project has not made any categorisation of the reports. Many of them reflect more than one category or area within the field of Performance Audit of the use of EDP.

6.1 Australia

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(FINEST)
1993-94
#2 ABS IT Security
#4 Various Payment and outsourced service contracts
#7 DSS Data matching (not by IT audit)
#13 ANSTO Purchase of supercomputer (not by IT audit)
#19 Defense Computer environment, SSRP
#31 CSIRO IT Security
#40 DEET IT Security
#44 DIEA Electronic capture of passenger card data

1994-95
#6 ATO IT Security

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6.5 Hong Kong

The computerisation of Companies' Registry Indexing System in the Registrar General's Department.

The computerisation of urban land registration records in the Registrar General's Department.

Delay in the computerisation of property maintenance in the Architectural Services Department.

Inadequacies in the use of financial appraisal in computer projects.

Inadequate strategic planning for provision of computer services to Government departments.

Management and control of end-user computing within the Government.
Disaster recovery planning for government computer installations.

The billing of water accounts in the Water Supplies Department.

The Urban Ticketing System of the Urban Services Department.

Implementation of a computerised Batch Payment System for the processing of building term maintenance contracts work orders in the Hong Kong Housing Authority.

Data sharing in the government.

The management and control of information technology in the Hong Kong Housing Authority.

Computerisation of land information in government.

The Government's mechanism for monitoring the progress and costs, and evaluating the results of computerisation projects.

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6.6 Israel

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tfn: +82 2 7219-290
fax: +82 2 7219-297
6.9 The Netherlands

All these audits are printed in Dutch.


Management of Contracts for Governmental Payment Services (22 June 1995, section in semi-annual report).

Financial Relation between Ministry and Social Housing Bodies: Grossing-up Claims and Debts (14 May 1996).

Population Registration System (30 August 1996).

Information Security at the Tax Authorities (9 April 1997).

Sectoral Descriptions of Information Relations (24 October 1997).


Financial management Regional Police (15 December 1998).

Approach of the Millennium Problem in the Social Insurance Sector (20 April 1999).

Approach of the Resolution of the Millennium Problem in relation to Public Safety (2 September 1999).

The Millennium Problem and the Health Sector (16 December 1999).

Quality of the Information Provision at two Public Bodies (10 May 2001).

The management of Governmental Payment services (17 May 2000, section in semi-annual report).


Other publications printed in English:


IT as Object of Audit; Results of a Questionnaire in 9 SAIs, 20 February 2001.


Publications by other parties:


BS 7799 obtainable via http://www.bsi-global.com/Information+Security+Homepage/index.xhtml

Information Security: Advances and Remaining Challenges to Adoption of Public Key Infrastructure Technology (GAO-01-277) downloadable via http://www.gao.gov/

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6.11 Sweden

D nr 1989:393. Rätt data?


Fg 1991:II. ADB i samverkan.

F 1992:2. Fe1 data kostar!


F 1993 : 34. Myndigheterna och informationsteknologi - IT.


RRV 1994:35. RAR polisens rationella anmälningsrutin.

RRV 1994:36. NUTEK, EU och IT-industrin.


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fax: +46 . 8 . 690 41 00
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6.12 The United Kingdom

6.12.1 Audit Commission Reports:


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Publications Section, Audit Support
Audit Commission
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Tfn: +44 . 117 . 9236757 extension 214 (Andy Mitchell).

6.12.2 National Audit Office:


Inland Revenue/EDS Strategic Partnership: Award of New Work, 1999-2000. ISBN 0105567280


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6.13 U.S.A.


Accessing Internal Controls in Performance Audits.

Government Auditing Standards

Assessing the Reliability of Computer-Processed Data
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Controls in an Information Systems Environment: Objectives, Guidelines and Audit Procedures, the Audit Procedures. EDP Auditors Foundation Inc.

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