

The Information Audit: Principles and Guidelines

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Auditing is a recognised management technique providing managers with an overview of the present situation regarding specific resource(s) and services within an organisation. Many different types of audits currently exist in the commercial world, including audits of information resources. Currently, as far as the researchers could determine, there exists no single accepted methodology for performing an information audit. In view of this, the researchers investigate whether it is possible (and desirable) to develop a standardised information auditing methodology. Investigating the nature and characteristics of the information audit as well as how a number of other audit types do this, e.g. the financial

audit, the communication audit. The researchers conclude that none of these are the same as the information audit, although similarities exist. Various information audit methodologies are discussed, evaluated and classified. The researchers conclude that even though the principles of the financial audit cannot be used to develop a standardised methodology for information auditing, information professionals can look towards the accounting profession for support in developing a standardised, universally accepted method for accurately determining the value of information entities. Guidelines for a standardised information audit methodology are identified.

Introduction

Auditing is an accepted management technique. Many different types of audits currently exist in the commercial world, e.g. financial audits, communication audits, technical audits, employment audits, and also more recently, information audits (Robertson 1994). The major purpose of an information audit is the identification of users' information needs as well as how well these needs are met by the information services department (St Clair 1995a).

Currently, as far as the researchers could determine, there exists no one accepted methodology for performing an information audit (cf. Haynes 1995; LaRosa 1991, Robertson 1994). There are also no standards for information auditing. This is in stark contrast with financial auditing where "formal standards lay down audit guidelines, checklists, techniques and operating standards which will apply to all types of organization ..."

(Robertson 1994). Robertson (1994) suggests that information professionals draw on the experiences of financial auditors when developing a standardised information auditing methodology.

In view of a number of different perspectives on the nature of the information audit, the scenario of a standardised information audit methodology can be questioned. Therefore, the question that arises is whether it is possible (and desirable) to develop a standardised methodology for information auditing. This article will attempt to find an answer.

Methodology

This article consists of a literature review and critical analysis and synthesis of the available material on information auditing. Where applicable, different opinions from the literature are compared critically.

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The financial audit

Audits are conducted in many different forms in organisations today. The purpose of auditing is diagnostic, i.e. to discover, check, verify and control some or other process/resource in an organisation. In different countries, different national prerequisites apply to who is allowed to perform different types of audits. For example, in South Africa independent audits may only be performed by auditors registered in terms of the Public Accountants' and Auditor's Act (The principles and practice of auditing 1992).

The original research that was conducted focused on the independent (external/financial) audit: its characteristics, objectives, advantages, etc. (Botha 2000). The main objective of a financial audit is to determine whether the financial statements (including the balance sheet, income statement and cash flow statement) of an organisation provide a fair representation of the operations and financial condition of the organisation (Flesher 1996).

Information-based types of audits

The research focused on a number of processes/audits that have a connection to information auditing, to a lesser or greater extent. In the original research these audits and processes were analysed with a view to indicating their applicability to designing an information audit methodology.

The reasons for choosing the specific types of audits that were discussed are as follows:

- The *communication audit* because of its focus on organisational information flow patterns;
- *Information mapping* for its focus on the identification and use of organisational information resources;
- The *information systems audit* for its investigation of the way in which technological tools are used to manage information resources (although implicitly);
- The *knowledge audit*: knowledge management (or strategic information management) is the "highest"/last level of information management (according to the evolution of information management functions) and therefore logically follows on information management and information auditing;
- The *intelligence audit* for its relationship with both information and knowledge management.

The researchers found that none of the audit types listed above can be regarded as the same as

an information audit. Elements of some of the processes and audits can be taken into account when designing an information audit methodology (Botha 2000).

The information audit

An information audit entails the systematic examination of the information resources, information use, information flows and the management of these in an organisation. It involves the identification of users' information needs and how effectively (or not) these are being met. In addition to this, the (monetary) cost and the value of the information resources to the organisation are calculated and determined. All this is done with a view to determining whether the organisational information environment contributes to the attainment of the organisational objectives and furthermore, to the establishment and implementation of effective information management principles and procedures. This is done so that information can be used to help the organisation maintain its competitive edge (Botha 2000).

It is important to note that an information audit is *not*:

- the same as an information needs assessment (St Clair 1995a) – the researchers found that an information needs assessment is only one component of an information audit;
- just an inventory of computers, information sources and the like (St Clair 1996);
- a form of industrial espionage (Webb 1994).

The main aim of an information audit is specific to the environment in which it is performed. If one were to attempt to generalise the aim of an information audit, it could be said that an information audit would be performed with the purpose of collecting the information that is needed to manage organisational information resources effectively, so that organisational objectives are met.

Benefits of an information audit

Downs (1988) discusses a number of benefits that result from performing a communication audit. The researchers have determined that these benefits are similar to the outcomes of an information

audit, namely validity, diagnostic, feedback, information and training benefits.

- *Validity benefit:* One of the results of a properly performed information audit is valid and accurate information on the status of information as a corporate resource. The quality of planning and management should therefore improve, as accurate, relevant and valid information is readily available (adapted from Downs 1988).
- *Diagnostic benefit:* The researchers have determined that the diagnostic benefit is one that is characteristic of the majority of audits. The diagnostic element of an audit allows for strong points and weak points (or “gaps”) to be identified. This information can be used to build on the strong points and to eliminate the weak ones (adapted from Downs 1988).
- *Feedback benefit:* An information audit is an important element in the process of feedback. The information audit is used to determine whether specific information inputs deliver the expected/desired information outcomes. The information audit is therefore an instrument of evaluation and provides information that can be used to plan and implement corrective actions (adapted from Downs 1988).
- *Information benefit:* A communication audit focuses attention on the process of communication in an organization and the improvement thereof. In the same manner, an information audit can help to focus staff members’ attention on the value and benefits of the use of information as a corporate resource (adapted from Downs 1988).
- *Training benefit:* According to Downs (1988) this benefit is the one that is most often overlooked. An information audit provides the ideal opportunity to involve staff in the auditing process and at the same time to teach them more about the processes, philosophy and structures that support the usage of corporate information resources. By the time the information audit has been completed, these staff members will have a better understanding and picture of information and its role in the organization (adapted from Downs 1988). The researchers feel that an information audit provides the opportunity to train staff members who will become information managers, or who will be involved in corporate information management processes in future.

The role of the information audit in the information management process

Information is increasingly recognised as a valuable resource that needs to be managed. In view of this, the researchers investigated the contribution of the information audit, if any, to the process of information management. This was done according to the functions of information management as identified and discussed by Boon (1990).

Level 1: Personal information management

- *Use of information:* One of the results of an information audit is knowledge of available information sources and where these are, i.e. an information inventory. This can enhance the use of information.
- *Archiving information and disposing of information:* The information inventory is analysed in terms of the usefulness of the information sources and according to this information, decisions regarding archiving and/or disposing can be made.
- *Marketing of information:* An information audit is an effective marketing tool in itself as it heightens information awareness (cf. the information benefit, discussed above).
- *Dissemination and reproduction of information; Organising information; Making information accessible; Protecting and storing information (Boon 1990):* A sound knowledge base of the status of organisational information resources can aid information management decisions about the dissemination, reproduction, organisation, accessibility, and protection/storage of information sources.

Level 2: Operational information management

- *Identification of information needs:* A very important component of the information audit is an information needs assessment.
- *Information is generated and/or needed information is procured; information is disseminated:* The comparison of the information inventory to the identified information needs will highlight where and what types of information are needed as well as to whom it should be made available.
- *Relevant information is identified:* During the information audit, identified information sources are evaluated in terms of their value/relevancy to the users thereof.

Level 3: Organisational information management

- *Development and provision of an information technology infrastructure:* The information audit can be structured to include an examination of information technology tools that can aid effective information management.
- *Determination of the value and cost of information:* Not all information audits include this as a phase but the researchers reckon that it is essential that the valuing and costing of information sources should form part of an information audit.
- *The compilation of an inventory of information entities:* This is a core component of the majority of information audits.
- *The co-ordination and implementation of an organisational information policy:* This can be one of the results of an information audit. Orna (1990) performs an informa-

tion audit with the purpose of developing and implementing an organisational information policy.

- *The organisation of information in an information system:* The information audit renders sufficient information to make decisions as to how organisational information sources should be organised.
- *Information education:* The information audit can be used as a sensitising tool, i.e. to heighten awareness of the importance of information as a resource.
- *Information consultation:* The information audit is performed with the purpose of consultation – cf. the various benefits of the information audit as discussed above.
- *The planning, development and continuous evaluation of information systems:* The information audit should be repeated at regular intervals for the purpose of evaluating information systems and sources.

Level 4: Corporate, strategic information management

- *The formulation of an organisational information policy:* As indicated above, the results of the information audit can be used for formulating an organisational information policy.
- The management of financial, physical and human resources in order to provide information systems; The facilitation of the sharing of organisational information that is relevant to planning; The co-ordination of the development of information resources for improved organisational and strategic decision-making; The management of access to information needed for the accomplishment of organisational goals and objectives, as well as the dissemination of this information: The results of an information audit provide a knowledge base that can be used for making management decisions about information sources.
- *The identification of strategic information needs* (Boon 1990): As has been indicated before, the information needs assessment is an essential component of the information audit.

The researchers conclude that an information audit can contribute significantly to effective information management, i.e. it can be regarded as a critically important information management tool. This is because the information audit provides detailed and accurate information of the organisational information environment as well as an understanding of the way in which the organisation functions.

Different approaches to information auditing

Discussions of a variety of different approaches to information auditing were found in the litera-

ture. The main approaches that were identified included:

- *Cost-benefit:* “The objective of a cost-benefit analysis is a list of options compared to each other on the basis of their cost and perceived benefit” (Ellis et al 1993).
- *Geographical:* The term ‘geographical approach’ reminds the researchers of the process of Infomapping whereby the identified information resources are presented graphically by plotting them on an information map (infomap) (Burk & Horton 1988). From the description of the geographical approach given by Ellis et al (1993), the similarity becomes clear as “the intention [of the geographical approach] is to identify the major components of the system and map them in relation to each other”.
- *Hybrid:* The information audits that are based on the hybrid approach, typically combines elements from more than one of the other approaches listed here, e.g. a methodology that contains elements of the geographical approach, but at the same time emphasises the calculation and determination of the costs and values of information resources, according to the cost-benefit methodology
- *Management information:* According to Ellis et al (1993) “[t]his has been mainly ... the audit of management information systems (MIS)”, but there is “potential for broader application”.
- *Operational advisory methodologies:* Ellis et al (1993) define the scope of a typical operational advisory audit in terms of what the objectives should be, i.e. to define the purpose of the audited system and to establish how effectively it is being accomplished; to establish whether the purpose is in congruence with the purpose and philosophy of the organisation; to check on the efficiency and effectiveness with which the resources are used, accounted for and safeguarded; to find out how useful and reliable the information system supporting the organisation is; and to ensure compliance with obligations, regulations and standards. The academic community is known for its culture of sharing information, research, and new ideas. Sharing new information through publication is important for the development of scholarship and scientific discovery. Because of the importance of shared scholarship, academic reward systems consider research publications by faculty to be vital. With this in mind, information professionals have worked to develop tools for identification of successful research publications.

Comparison of different information audit methodologies

For the purpose of the original research each of the information audit methodologies that were studied, were analysed in terms of its approach and the strong and weak points thereof. The methodologies were subsequently compared.

Operational advisory audits

The researchers determined that operational advisory audits typically consist of the following main phases:

- *Define the organisational environment:* Identify the major goals of the organisation and determine what constraints affect the organisational information systems.
- *Planning:* Proper and detailed planning is a prerequisite to the success of the information auditing process.
- *Identify users' information needs:* Determine what information users require in order to perform their tasks (so that organisational objectives and goals can be met).
- *Design the questionnaire:* The questionnaire is the instrument that is used to collect data during the audit.
- *Send memos to interviewees/Make appointments with interviewees:* Once interviewees have been selected so as to be representative of the staff composition of the organisation, appointments must be made with all interviewees.
- *Investigate technology:* Identify the technology that is used to handle and manage organisational information resources.
- *Analysis:* Analyse the findings of the information audit.
- *Costing and valuing:* The value and cost of the identified information resources must be determined/calculated.
- *Test key control points:* Test key control points of the organisational information system. This helps to identify systems failures.
- *Generate alternative solutions/Evaluate alternatives:* Generate alternative methods for solving the system problems that have been identified. Evaluate these methods carefully before making a final decision.
- *Monitor adherence to existing standards and regulations:* Make sure that the decisions that have been made during the previous phase are in accordance with organisational/system standards and regulations.
- *Write the final report:* A detailed report must be compiled in accordance with the audit findings.
- *Implement monitoring mechanisms:* The final audit report (see previous phase) should include proposals with respect to the implementation of mechanisms that can be used to monitor the data included in the report.

The different operational advisory audit methodologies that were identified are compared in Table 1. The criteria for comparison are the main phases identified above. A ✓ indicates that a specific phase is included in the methodology of an author, while an empty block indicates the absence of that phase in the specific methodology.

In instances where an author focuses on a specific element of a phase, this has been indicated by means of comments.

Although very few authors include the defining of the organisational environment in their information audit methodologies, the researchers regard this as an essential phase that should be included. Less than half of the authors include a specific phase for planning. The researchers regard this as a phase essential to the success of an information audit. The same applies to the information needs assessment. It is of the utmost importance to know what the information needs within the organisation are as this enables one to determine whether the information resources are relevant and of any value. The majority of the authors studied include a phase during which an information inventory is compiled. The researchers agree with this, as one of the aims of an information audit is to collect information on organisational information resources. Only three of the authors indicate that monitoring mechanisms should be implemented upon completion of the information audit. The researchers feel strongly that the results of the audit should be implemented and used so as to make the exercise worthwhile.

Geographical audits

The following phases were identified as common to the majority of geographical information audits:

- *Analyse the users' information needs:* Identify the information needs of organisational information users. Keep in mind that these are a reflection of organisational (information) needs.
- *Compile an information inventory:* Take stock of the information sources, systems and services in the organisation.
- *Match the identified information needs to the identified information sources:* This phase follows logically from the previous 2 phases and enables the auditor to identify information gaps and/or areas of duplication.
- *Design a solution:* The information that has been collected up to this point must be used to find solutions to identified problems.
- *Design an implementation plan:* Once a solution has been identified and accepted, an implementation schedule must be drawn up to ensure that the results of the audit are used practically.

Table 1. Comparison of different operational advisory audit methodologies

	Barker (1990)	Dubois (1995)	Eddison (1992)	Gibson (1996)	LaRosa (1991)	Robertson (1994)	St Clair (1995a,b,c)	Swash (1997)	Webb (1991)
Define organisational environment	✓				Identify potential markets	✓			
Planning		✓			Select specific markets; Identify contact persons	Determine purpose of audit; Identify who will perform audit		✓	
Identify users' information needs	✓			Identify users of information					
Design questionnaire						✓			
Send memo to interviewees;									
Make appointments with interviewees						✓			
Investigate technology				✓				Perform an information technology audit	
Analysis	Identify strong & weak points; Evaluate weak points	The results of the survey are used to develop a blueprint (addressing the creation, identification, cost, use & communication of information)	✓	✓	✓	✓	✓	✓	✓
Costing and valuing									
Test key control points	✓								
Generate alternative solutions;	✓								
Evaluate alternatives									
Monitor adherence to standards & regulations	✓								
Write report									
Make recommendations		✓						✓	
Implement monitoring mechanisms		✓							Implement recommendations

Table 2. Comparison of the geographical approach to information audits

	De Vaal & Du Toit (1995)	Haynes (1995)
Analyse users' information needs		
Compile information inventory		✓
Match information needs to information sources		This is done by means of information resources mapping, i.e. mapping the information flows in the organisation
Identify strong and weak points		✓
Design a solution	✓	
Design implementation plan		✓

Very few authors follow the geographical approach when performing an information audit. The researchers like this approach because of the emphasis on the visual presentation of information. Many of the elements that have been highlighted as important to the operational advisory audit are also present in geographical audits, e.g. the information needs assessment, the information inventory, the analysis of the information by comparing the information needs to the identified information sources and the follow-up procedures in the form of solutions and/or implementation plans. Unfortunately the methodology of De Vaal & Du Toit (1995), an example of one of the few practical case studies, includes very few of these elements as shown in Table 2.

Cost-benefit approach

Alderson (1993) does not discuss the cost-benefit approach to the information audit in detail, nor does Riley (1975), therefore a proper comparison could not be made. The researchers found it difficult to comment on the cost-benefit audits as the ones that were studied only list the components of the respective information audits. The approaches that are used to cost information sources can however be considered when designing an information audit methodology.

Information auditing principles are integrated with accounting principles in the methodology discussed by Alderson (1993). The methodology focuses strongly on determining the cost and value of information used in an organisation. The information audit was conducted with the purpose of monitoring the use of an online database by determining the online expenses and patterns of use.

In the case study discussed by Alderson (1993) the corporate library managed the information audit.

- *Patterns of use:* The first phase of the information audit entails gathering information on the usage of online information services by staff within the organisation (Alderson 1993).
- *Valuing information resources:* Alderson (1993) does not offer any further discussion on the information auditing methodology that was used, except for a brief discussion on measuring the value of information resources. He briefly discusses a number of ways in which the value of information resources can be calculated.

The main advantage resulting from the information audit was relevant information that enabled the organisation to take steps to control the costs associated with online information (Alderson, 1993). The information auditing process as described by Riley (1975) is made up of a number of relative cost factors. The following are the typical cost factors that should be considered when acquiring a new information product:

- *Time:* Riley (1975) states that "it is necessary to quantify the time saved in data collection by using new [or existing] information products versus the development of the needed information by one's own means."
- *Space:* Calculate (at annual cost per square metre) how much space is currently being used for storing information collections. Do the same calculation for the new information product that is under consideration.
- *Equipment:* Calculate the costs of acquiring new equipment that will be required for using a new information product.
- *Personnel costs:* Determine the number of people currently employed to manage (collect, record, file, etc.) data/information. A new information product may not necessarily need fewer people, but they might be used in a different (e.g. more productive) way or used for performing new tasks.

Table 3. Comparison of the cost-benefit approach to information audits

	Alderson (1993)	Riley (1975)
Patterns of use	✓	
Costing	Calculate: – Cost-savings – Costs of online searches – Return on investment	Cost factors: – Time – Space – Equipment – Personnel costs – Redesign efforts – Currency – Completeness – Accuracy

- *Redesign efforts:* Calculate the costs involved in developing a product from scratch, as opposed to buying a commercially available product.
- *Currency, completeness and accuracy:* The specific environment and the type of information and information needs will determine the requirements for currency, completeness and accuracy of information. An example is to calculate the cost of archiving, whereas in some environments there may be no or very little need for historic information (Riley 1975).

The researchers conclude that Riley’s methodology places a strong emphasis on measuring quantifiable costs, therefore this methodology can be classified as a cost-benefit approach, even though the benefit component is not addressed directly. The organisational environment and information needs are not taken into account. The researcher regards the different cost factors as useful and these can be considered when developing an information audit methodology as shown in Table 3.

Hybrid approaches

Operational advisory approach and geographical approach

Information audits that were based on this hybrid approach, typically consisted of the following main phases:

- *Promote (market) the information audit:* During this phase the auditor and his team must obtain support from management and co-operation from staff for the information audit.
- *Define the organisational environment:* The auditor must familiarise him-/herself with the environment within which the information audit is going to be performed. This can be done by looking at the corporate objectives, or by creating a profile of the current situation.

- *Planning:* As is the case with other information audit methodologies that have been discussed, proper planning is essential for the ultimate success of the information audit.
- *Collect data:* During this phase the needed data is collected. As can be seen from the table below, the different methodologies have different focuses for data collection.
- *Analysis:* Once all the data has been collected it must be analysed according to the goals and objectives of the information audit.
- *Costing:* A number of the methodologies listed below, try to calculate the financial value of the information resources of the organisation.
- *Compile the final report:* Consolidate the collected data and the analysis of this data into a final report/strategic intelligence blueprint.

The hybrid approaches that are compared in the table above combine many of the best elements of the methodologies that have been studied thus far. For example: the promotion of the audit (i.e. obtaining top management support and “marketing” the audit); defining the organisational environment; the planning phase; the collection of data (including the information needs assessment); the analysis of the information; the costing of the information sources; and the conclusion, i.e. the compilation of the final report. The researchers reckon that these phases are relevant when it comes to the development of guidelines for an information audit methodology.

Operational advisory approach and cost-benefit approach

The phases common to this hybrid approach are:

- *Planning:* The success of an information audit depends on preparing and submitting a good proposal. The proposal can be used to convince management of the

Table 4. Comparison of information audit hybrid methodologies

	Booth & Haines (1993)	Buchanan & Gibb (1998)	Lubbe & Boon (1992)	Quinn (1979)	Stanat (1990)
Promote the information audit		✓			
Define organisational environment	Review corporate objectives	✓	✓	Profile current set-up, i.e. compile a picture of the current state of information resources in the organisation	✓ (as part of pre-audit procedure)
Planning	Design questionnaire; Train the staff members who will conduct the interviews & ensure that support structures are in place				✓
Collect data	Conduct interviews	Identify information flows; Identify organisational information resources (finalise preliminary inventory)	Identify all internal & external information sources	Identify staff information requirements	Determine organisational information needs; Identify available information resources
Analysis	✓	✓	Evaluate & determine value of information resources		✓
Costing		✓	Calculate capital & operating costs		Evaluate corporate investment in internal & external information sources
Compile report		✓	✓		Develop strategic intelligence blueprint to point out any discrepancies between users' identified information needs and the information (re)sources used to satisfy these needs

importance of performing an information audit. Once the proposal has been approved, it can be used as a guideline for performing the actual audit.

- *Preparation:* Make sure that everything that is needed for the information audit, is in place before one starts with the actual audit. This can include the designing of questionnaires and the identification of interviewees.
- *Collect the data:* This phase closely resembles a traditional information needs assessment. During this phase where

the information needs of patrons must be identified and an answer must be found to *what* the clients in the organisation need as far as information sources/services and products are concerned.

- *Set up databases & key in the collected data:* Electronic databases are developed for saving the collected information.
- *Cost & value the identified information resources:* Once again there is a focus on determining the financial in-

Table 5. Comparison of operational advisory approach and cost-benefit approach

	Hamilton (1993)	Jurek (1997)	Orna (1990)
Planning	Prepare proposal		Pre-audit: Initial investigation ✓
Preparation	Design questionnaire; Select interviewees		
Collect data	Conduct interviews	Perform information needs assessment	Identify information available in the organisation; Identify resources for making information available
Set up databases; Key in data	✓	Compile profiles of information sources	
Cost & value information resources	✓		✓ Focus on valuing information resources by determining how information is used to further the purposes of the organisation Identify those responsible for managing & processing information Identify & evaluate information technology used to manage information resources
Compile final report	✓	Develop information management plan	(Included as component of post-audit procedure)
Present final report	✓		

vestment in organisation information resources, as well as users' perceptions of the value of these.

- *Compile the final report:* Compile the findings of the information audit.
- *Present the final report:* This phase is implied in many of the other audit methodologies, but is mentioned specifically in this approach.

In contrast to the previous hybrid audits the ones in Table 5 do not regard the initial investigation as very important – only one author (Orna 1990) includes it in her methodology. The researchers regard the absence of this phase as a limitation. The planning phase seems to be more important (i.e. two authors make mention of it – Hamilton 1993; Orna 1990). All the authors focus on the collection of data (including an information needs assessment). The capturing of the collected information receives attention. This is important in view of the information being available again at a later stage to be used as a knowledge base of the state of information in an organisation.

Conclusion: A standardised information audit methodology

The problem that the researchers found with the majority of information audit methodologies that are discussed in the literature are verbalised by Buchanan & Gibb (1998): "... many are characterised by a very definite purpose and scope which makes their universal adoption difficult."

Furthermore Buchanan & Gibb (1998) found that "[i]t is apparent ... that no single information audit methodology can provide a complete information audit solution and that none can fully fulfil the strategic role of the information audit."

The only attempt at designing a "universal" information audit methodology was made by Buchanan & Gibb (1998). There are however still limitations to their model that makes its universal adoption problematic.

The researchers therefore conclude that currently it does not seem possible or desirable to

develop a standardised information audit methodology. The reasons for this include:

- The unique characteristics of information as a resource – this complicates the management thereof.
- It seems to be desirable to allow for different approaches to information auditing (cf. Ellis et al 1993) in different (unique) information environments.
- The fact that a previous attempt at developing a “universal” information audit methodology has not been 100% successful.
- When one looks at the example of a standardised audit methodology (e.g. financial auditing), it becomes clear that there is a long history of national and international developments behind these. If any attempt were ever to be made to standardise information auditing methodology, this would have to be driven by a strong, international information-oriented body that would be able to influence strong, national bodies to monitor and encourage the implementation of auditing standards, training standards, etc. It should also be taken into account that international accounting and auditing standards are not enforceable. The same will most probably happen if international standards for information audits were to be developed. The standards would only be useful as guidelines.
- Furthermore, the main reason for developing standardised information audit methodologies is usually the requirements for adherence to legislation. For example: in the USA the financial statements of organisations that reflect the value of corporate information resources must be prepared according to financial standards and legislative requirements.
- According to Robertson’s (1994) statement, the standardised methodology envisioned by him is not supposed to limit organisations in the execution of information audits, but rather to *guide* them in terms of elements to investigate and tasks to include in the performance of such an audit – the methodology as proposed by Buchanan & Gibb (1998) would therefore be acceptable. The researchers, however, do not foresee the possibility of developing a standardised information audit methodology that would adhere to legal implications and requirements, such as is the case with the financial audit.
- The researchers have identified components of information auditing methodology that could be standardised. These include the costing and valuing of information resources.

Financial auditing versus information auditing

Despite the fact that information auditing methodology is not standardised and that there does not seem to be a possibility of doing this, the researchers have identified certain similarities in

terms of procedures and activities, as well as areas where information professionals can learn from the example of auditing (see Table 7).

From Table 6, it becomes clear that information audit methodologies have many elements in common with standardised financial audits. The only difference is that information audit methodologies do not adhere to legal requirements.

Information professionals can also learn from the example of the so-called working papers compiled by auditors. These working papers contain important audit evidence and for this purpose all audit activities must be thoroughly documented. The documentation gathered and included as audit evidence in the working papers can range from charts, schedules and interview notes to internal reports and memoranda (Flesher 1996).

Guidelines for information auditing

According to Gibson (1996) “there are some assumptions that can be made as to what [an information audit] should cover”. One of the purposes of the original research was to identify such general/basic elements of an information audit. Since the researchers do not foresee the standardisation of information auditing methodology the conclusion is made that an information audit should contain the components listed below – taking into account the time available to conduct the audit and the available resources. These main phases are based on what the researchers identified as common to the majority of information audits (and the different approaches):

- Planning
- Information needs assessment
- Information inventory
- Costing and valuing information resources
- Analysis
- Report (with recommendations)

As is the case with the “universal model” that was developed by Buchanan & Gibb (1998:47), the phases that are listed here are “intended to be wide-ranging and of general applicability but it is recognised that organisations may need to make compromises, or may wish to use a sub-set of steps, or may need to enhance or tailor it to their specific requirements”.

Table 6. Financial versus information auditing

Financial Auditing	Information Auditing
In financial auditing "formal standards lay down audit guidelines, checklists, techniques and operating standards which will apply to all types of organization and have evolved over many years" (Robertson 1994).	As has been explained, this is not the case with information audit methodologies.
Activities common to all types of audit assignments: <ul style="list-style-type: none"> - Planning, control and supervision - Fact finding, analysis & documentation - Recommending - Reporting (Flesher 1996). 	All these activities apply to information audits. The majority of information audit methodologies that were studied during the course of this research include the first two sets of activities. Not all of these go as far as preparing final reports and making recommendations. The researchers identify the latter two stages as very important phases that should be included in all information audit methodologies.
Different approaches to the auditing process include: <ul style="list-style-type: none"> - Balance sheet approach - Systems-based approach - Transaction flow or cycle approach - Risk-based approach (The principles and practice of auditing 1992). 	Even though no standardised information audit methodology exists, there are "recognised approaches to the audit process" (Gibson 1996). Different authors identify different approaches to information auditing – as has been pointed out earlier on in this article.
Robertson (1994) identifies three general types of financial audits commonly used in the commercial environment. These are financial audits used for: <ul style="list-style-type: none"> - The physical verification of assets and liabilities; - Control and compliance issues; and - Investigative matters". 	According to Robertson (1994) the majority of information audits currently performed in organisations can be classified as similar to the first type of financial audit listed in the column to the left, i.e. information audits that are used to compile inventories of organisational information resources. The researchers have identified very few information audit methodologies where compliance issues are addressed. Although compliance is included in the operational advisory audit approach as described by Ellis et al (1993), very few of the audits that were identified as operational advisory audits, actually addressed this component. An element of compliance forms part of Barker's (1990) methodology, where adherence to standards and regulations are determined. A few of the information audits performed in organisations can be classified as similar to the third type of financial audit listed in the column to the left, i.e. investigative for reasons that differ from those for which an investigative financial audit is performed (e.g. in situations where an information source is not used; or where a system is not functioning properly; or where an information centre is to be closed down because it is undervalued).
An audit is performed as a preventative (pro-active) measure (Downs 1988).	The same applies to information auditing.
No two internal audit assignments are performed exactly the same way, i.e. no "routine" internal audit assignment exists. Every assignment and its objectives are unique.	The same applies to information audits.
The typical responsibilities of an internal auditor, include: <ul style="list-style-type: none"> - To aid the organisation in the effective discharge of its objectives; - Information is collected for management; - The direction of the audit is looking forward. 	Many of the information audits that were studied had similar objectives, i.e.: <ul style="list-style-type: none"> - To determine whether the information resources contribute to organisational objectives; - Information is collected for management; - The direction of the audit is looking forward (by evaluating the current situation).
Another type of audit, the operational audit, is aimed at "... an organized search for efficiency- and effectiveness-related problems ... [within] an entity or one of its subdivisions" (Flesher 1996).	In studying the different information audit methodologies it became clear that some of the audits were performed in order to evaluate the efficiency and effectiveness of a specific information system (e.g. Barker 1990); a specific entity such as the corporate library/information centre (e.g. Gibson 1996); or with the purpose of establishing effective information management procedures (e.g. Lubbe & Boon 1992).

Table 6. Financial versus information auditing (continued)

<p>The overall approach to operational auditing entails the following:</p> <ol style="list-style-type: none"> 1. Seek out and identify the organisation's objectives. 2. Determine the pertinent facts and conditions by conducting a physical tour; obtaining internal forms and documents; interviewing departmental employees; preparing financial analyses. 3. Define problem areas or opportunities for improvement. 4. Present findings to management. 	<p>The main activities common to the majority of information audits that were studied included the following:</p> <ol style="list-style-type: none"> 1. Defining the organisational environment. 2. Data collection (by conducting a physical tour and/or obtaining relevant documentation and/or interviews and analysis of the collected information). 3. The identification of strong and weak points. 4. The compilation of the final report and the presentation of the findings to management.
<p>In terms of the classification of audits, the restricted (or partial) audit is not required by law, but is requested by a client (The principles and practice of auditing 1992).</p> <p>Three aspects that auditors have to consider, are:</p> <ul style="list-style-type: none"> - the size of the company; - the statutory requirements (if any) that govern the audit; - the wishes of the client (The principles and practice of auditing 1992). 	<p>The majority of information audits could be classified as restricted or partial audits, in the sense that these are not required by law, but are usually requested by management.</p> <p>The person who must perform an information audit must also consider the first and the last aspects (listed in the column to the left) during the planning phase. The second aspect might apply to information audits in specific situations, e.g. in the USA - the financial statements resulting from an information audit.</p>
<p>The characteristics of advisory audits include the following:</p> <ul style="list-style-type: none"> - it is diagnostic; - it is used to evaluate the appropriateness of existing information systems and services; - it informs users in the organisation of its findings (Ellis et al 1993). 	<p>The majority of information audits are of an advisory nature and have the same characteristics as (financial) advisory audits.</p>
<p>Planning is the second activity of a typical audit and essential to the success of the audit:</p> <ul style="list-style-type: none"> - During the Planning phase of an audit the auditor must obtain knowledge of the entity's business. - Formulate an audit approach. - The preparation of a written audit programme. 	<p>The importance of proper planning is emphasised by a number of authors who discuss information auditing. The researchers have determined that proper planning is the key to the success of any project.</p> <ul style="list-style-type: none"> - This part of the planning phase (cf. column to the left) is similar to the part of the information audit where the organisational environment is defined. - The audit approach forms part of the information audit, i.e. where the auditor has to decide which approach to follow, e.g. a hybrid approach, a cost-benefit approach, a compliance-based approach, etc. - The written audit programme also forms part of the majority of information audit methodologies.

Keep in mind that when designing an information audit methodology, the auditor should take into account the organisational environment, the structure of the organisation, as well as its mission, goals and functions (Stanat 1990). A prerequisite for the development of an information audit methodology is a clearly defined scope and purpose (Buchanan & Gibb 1998).

The prerequisites for conducting a successful information audit are:

- Support from top management
- Skilled staff to conduct the investigation and the audit
- Sufficient time to complete the research
- Free access to relevant information and the right people

- Standardised methods for managing the investigation and reporting the results thereof (Orna 1990).

On another level a question can be raised as to whether it is necessary to include a step where the value of information is determined – should this be “compulsory” or not? The researchers feel strongly that such a phase should be included. There are however arguments to the contrary, especially in view of the difficulty in determining the value of information sources/products. Swash (1997) warns that “[t]he problems of quantifying the exact contribution of a specific term of information may ... prove insurmountable.” Furthermore, many of the information audits that were studied exclude the determination of the cost and

Table 7. What information professionals can learn from financial audits

Financial Auditing	Information Auditing
<p>The instructions that an auditor receives from the client determine the scope of a specific audit. The instructions must be confirmed in writing.</p> <p>Compliance audits are performed to determine whether an organisation is meeting certain specified requirements, e.g. internally or externally imposed laws, regulations, standards, policies, plans and procedures. Management can request a compliance audit or it can be performed to satisfy a legal requirement. Over the past few years, compliance audits have become increasingly important, as organisations are being held accountable at a higher level for their performance. Boards of directors, top management, stockholders, taxpayers and governments (Flesher 1996) request accountability.</p> <p>The auditing process is made up of four main procedures and activities, i.e.:</p> <ul style="list-style-type: none"> - Pre-engagement activities; - Planning; - Compliance and substantive procedures; - Evaluating, concluding and reporting. <p>The Pre-engagement activities include amongst other things:</p> <ul style="list-style-type: none"> - Determining the skills and competence requirements; - Establishing terms of agreement (The principles and practice of auditing 1992). <p>Evaluating, concluding and reporting make up the final procedure of the auditing process.</p> <p>The auditor's responsibilities include:</p> <ul style="list-style-type: none"> - Reporting his/her opinion; - Conducting the audit with due professional care and competence; - Maintaining an independent mental attitude; - Reporting on material irregularities; and detecting and reporting illegal acts, as well as other irregularities and errors. 	<p>This is an aspect that can be applied by those who perform information audits, i.e. that the audit assignment should be specified clearly, in writing.</p> <p>The researchers have determined that very few of the information audits that were studied, contained elements of compliance. In view of the increasing importance of compliance audits in terms of accountability, information professionals should look at setting organisational standards and implementing organisational policies for information management and the evaluation of these through the inclusion of compliance components in information audits.</p> <p>Information professionals can consider the following two aspects of the Pre-engagement activities, i.e.:</p> <ul style="list-style-type: none"> - Ensuring that the auditing team is made up of people with the necessary skills and competencies; - Establishing a formal agreement with management as to the scope and purpose of the information audit and to get a copy of the agreement – in writing. <p>Evaluating, concluding and reporting are not included in all the information audits that were studied. The researchers feel strongly that it should be included. Swash (1997) stresses the fact that the recommendations resulting from the information audit are of vital importance.</p> <p>The information profession can learn from this and it should be expected of the information auditor:</p> <ul style="list-style-type: none"> - To report his/her opinion (i.e. feedback); - Conduct the audit with professional care and competence (i.e. a qualified information professional should perform the information audit); - Maintain an independent mental attitude, especially if the auditor is a staff member; - Report any problems that he/she comes across.

value of identified information sources. According to Swash (1997) this is unusual and undesirable as costing and valuing make up an essential component of the information auditing process. The exclusion of such a crucial component of the information audit, does however, support the presumption that information audit methodology can be adapted according to individual circumstances. More research is needed about methods (standardised if possible) to determine the economic value of information entities, e.g. a form of "information accounting" (McPherson 1994).

The researchers therefore conclude that even though the principles of the financial audit cannot be used to develop a standardised methodology for information auditing, information professionals can look towards the accounting profession to support them in developing a standardised, universally accepted method for accurately determining the value of information entities. This method will have to make provision for measuring the intangible values of such entities.

As far as the auditing of information technology is concerned (as part of an information audit), the

following applies: The auditing of information technology is an accepted, standardised procedure performed by accountants. This type of audit "seeks to manage and control costs and information flows, as well as to improve enterprise wide efficient access to information" (Jurek 1997). The researchers furthermore conclude that one cannot really audit information resources properly without taking into account the enabling information technology.

The future of information auditing

A characteristic of the so-called "information economy", is that companies invest "often considerable resources" in information resources. The information services manager has the responsibility of justifying this investment to management (St Clair 1996). The traditional way in which this is done is by means of reports to management. At times however, more information might be needed. In order to obtain an overview of the state of the information services department, an information audit can be conducted.

According to Alderson (1993) performing information audits will become increasingly important and will form part of the job description of the so-called "new" information professional. Information professionals can contribute to increased information awareness in organisations by requesting/suggesting a corporate information management review. Furthermore they can contribute by compiling literature reviews of information auditing techniques (Booth & Haines 1993).

Information professionals agree that the results of an information audit can be valuable to an organisation in the development of an organisational information management plan. There are, however, still a number of questions for which answers have to be found. Robertson (1994) asks whether the experience of financial auditors should be incorporated in order to develop a standardised information auditing methodology. Other problems identified by him, include the following:

1. Information audits represent the state of information in an organisation at one particular point in time. A way/method has to be found to follow up such an investigation in order to keep information of organisational information resources up to date. Robertson

(1994) suggests once again that information professionals look to financial auditors for advice on this issue, as financial audits are performed frequently in organisations for a variety of reasons.

2. A second problem that has been mentioned, is the difficulty of calculating the costs and determining the value of information resources.

Information auditing also presents information professionals with opportunities: According to Booth & Haines (1993) many opportunities exist for information professionals to involve themselves in the information auditing process when performed in organisations.

Currently, in many information centres/corporate libraries there is a constant threat of cost cutting. The ideal scenario is that the value of information is recognised and that information be used for decision making at all levels in an organisation. Few companies have the ability to identify and evaluate what information resources are available internally and at what cost. Dubois (1995) regards information auditing as a potential solution to these and other information problems that occur in organisations. The cost of information must be connected to the value of information in the organisation.

From the discussion in this article it becomes clear that more research is needed on the topic of information auditing and that more methodologies need to be tested in practice. This would enable information professionals to develop reliable information auditing methodologies that can be used with confidence.

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